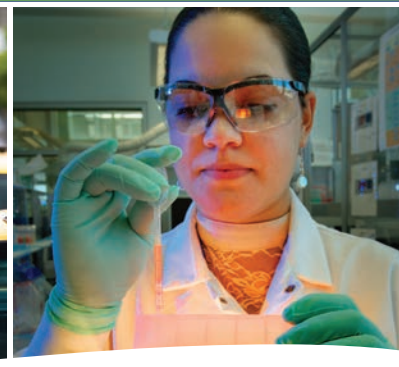




2018

Fourth National Report on Human Exposure to Environmental Chemicals *Updated Tables, March 2018, Volume Two*



**U.S. Department of
Health and Human Services**
Centers for Disease
Control and Prevention

Complete Table of Contents - Volumes One and Two

Volume One

General Information

- 1 Introduction and Public Health Uses
- 4 **What's New and Different?**
- 6 Data Sources and Data Analysis
- 12 Interpretation of Report and Updated Tables Data: Important Factors
- 14 Calculation of Urinary Inorganic-related Arsenic Species
- 15 Calculation of PFOS and PFOA as the Sum of the Isomers
- 17 Chemical and Toxicological Information

Adducts of Hemoglobin

- 19 Acrylamide
CAS No. 79-06-1
- 20 Glycidamide
CAS No. 486-56-6

Tobacco Smoke

- 21 Cotinine
CAS No. 486-56-6
- 24 Hydroxycotinine
- 25 NNAL
CAS No. 76014-81-8

Disinfection By-Products

- 29 Bromodichloromethane
CAS No. 75-27-4
- 31 Dibromochloromethane (Chlorodibromomethane)
CAS No. 124-48-1
- 33 Tribromomethane (Bromoform)
CAS No. 75-25-2
- 35 Trichloromethane (Chloroform)
CAS No. 67-66-3

Personal Care and Consumer Product Chemicals and Metabolites

- 37 Benzophenone-3
CAS No. 131-57-7
- 41 Bisphenol A
CAS No. 80-05-7
- 45 Bisphenol F
- 47 Bisphenol S
- 49 4-*tert*-Octylphenol
CAS No. 140-66-9
- 51 Triclocarban
CAS No. 101-20-2
- 53 Triclosan
CAS No. 3380-34-5
- 57 Butyl paraben
CAS No. 94-26-8

- 61 Ethyl paraben
CAS No. 120-47-8
- 65 Methyl paraben
CAS No. 99-76-3
- 69 *n*-Propyl paraben
CAS No. 94-13-3
- 73 2,4-Dichlorophenol
CAS No. 120-83-2
- 77 2,5-Dichlorophenol
CAS No. 583-78-8

Flame Retardant Metabolites

- 81 Bis(1-chloro-2-propyl) phosphate (BCPP)
- 83 Bis(2-chloroethyl) phosphate (BCEtP)
- 85 Bis(1,3-dichloro-2-propyl) phosphate (BDCPP)
- 87 Dibenzyl phosphate (DBzP)
- 89 Dibutyl phosphate (DBuP)
- 91 Di-*o*-cresylphosphate (DoCP)
- 93 Di-*p*-cresylphosphate (DpCP)
- 95 Diphenyl phosphate (DPhP)
- 97 2,3,4,5-Tetrabromobenzoic acid (TBBA)

Fungicides and Metabolites

- 99 *ortho*-Phenylphenol
CAS No. 90-43-7
- 101 Ethylene thiourea
CAS No. 96-45-7
- 103 Pentachlorophenol
CAS No. 87-86-5
- 105 Propylene thiourea
CAS No. 2122-19-2

Herbicides and Metabolites

- 107 Atrazine
CAS No. 1912-24-9
- 109 Atrazine mercapturate
CAS No. 138722-96-0
- 111 Desethyl atrazine
CAS No. 6190-65-4
- 113 Desisopropyl atrazine
CAS No. 1007-28-9
- 115 Desisopropyl atrazine mercapturate
CAS No. 1007-28-9
- 117 Diaminochlorotriazine
- 119 2,4-Dichlorophenoxyacetic acid
CAS No. 94-75-7
- 123 2,4,5-Trichlorophenoxyacetic acid
CAS No. 93-76-5

Sulfonyl Urea Herbicides

- 127 Bensulfuron-methyl
CAS No. 83055-99-6

- 129 Chlorsulfuron
CAS No. 64902-72-3
- 131 Ethametsulfuron-methyl
CAS No. 97780-06-8
- 133 Foramsulfuron
CAS No. 173159-57-4
- 135 Halosulfuron
CAS No. 135397-30-7
- 137 Mesosulfuron-methyl
CAS No. 208465-21-8
- 139 Metsulfuron-methyl
CAS No. 74223-64-6
- 141 Nicosulfuron
CAS No. 111991-09-4
- 143 Oxasulfuron
CAS No. 144651-06-9
- 145 Primisulfuron-methyl
CAS No. 86209-51-0
- 147 Prosulfuron
CAS No. 94125-34-5
- 149 Rimsulfuron
CAS No. 122931-48-0
- 151 Sulfometuron-methyl
CAS No. 74222-97-2
- 153 Sulfosulfuron
CAS No. 141776-32-1
- 155 Thifensulfuron-methyl
CAS No. 79277-27-3
- 157 Triasulfuron
CAS No. 82097-50-5
- 159 Triflusulfuron-methyl
CAS No. 126535-15-7

Insect Repellent and Metabolites

- 161 N,N-Diethyl-*meta*-toluamide (DEET)
CAS No. 134-62-3
- 165 3-(Diethylcarbamoyl) benzoic acid (DCBA)
CAS No. 858981-15-4
- 169 N,N-Diethyl-3-(hydroxymethyl) benzamide (DHMB)
CAS No. 72236-22-7

Carbamate Pesticide Metabolites

- 173 Carbofuranphenol
CAS No. 1563-38-8
- 175 2-Isopropoxyphenol
CAS No. 4812-20-8

Organochlorine Pesticide Metabolites

- 177 2,4,5-Trichlorophenol
CAS No. 95-95-4
- 179 2,4,6-Trichlorophenol
CAS No. 88-06-2

Organophosphorus Insecticides: Specific Metabolites

- 181 Acephate
CAS No. 30560-19-1
- 183 Dimethoate
CAS No. 60-51-5
- 185 Methamidophos
CAS No. 10265-92-6
- 187 Omethoate
CAS No. 1113-02-6
- 189 Malathion dicarboxylic acid
CAS No. 1190-28-9
- 191 2-Isopropyl-4-methyl-pyrimidinol
CAS No. 2814-20-2
- 193 *para*-Nitrophenol
CAS No. 100-02-7
- 195 3,5,6-Trichlor-2-pyridinol
CAS No. 6515-38-4

Organophosphorus Insecticides: Dialkyl Phosphate Metabolites

- 197 Diethylphosphate (DEP)
CAS No. 598-02-7
- 201 Dimethylphosphate (DMP)
CAS No. 813-78-5
- 205 Diethylthiophosphate (DETP)
CAS No. 5871-17-0
- 209 Dimethylthiophosphate (DMTP)
CAS No. 59401-04-6
- 213 Diethyldithiophosphate (DEDTP)
CAS No. 298-06-6
- 217 Dimethyldithiophosphate (DMDTP)
CAS No. 756-80-9

Pyrethroid Metabolites

- 221 *trans*-3-(2,2-Dichlorovinyl)-2,2-dimethylcyclopropane carboxylic acid
CAS No. 55701-05-8
- 225 *cis*-3-(2,2-Dibromovinyl)-2,2dimethylcyclopropane carboxylic acid
- 227 4-Fluoro-3-phenoxybenzoic acid
CAS No. 77279-89-1
- 229 3-Phenoxybenzoic acid
CAS No. 3739-38-6

Metals and Metalloids

- 231 Antimony
CAS No. 7440-36-0
- 237 Arsenic, Total
CAS No. 7440-38-2
- 241 Inorganic-related Arsenic Species
- 245 Arsenic (V) acid
- 249 Arsenobetaine
CAS No. 64436-13-1
- 253 Arsenocholine
CAS No. 96055-45-7
- 257 Arsenous (III) acid
CAS No. 13464-58-9

- 261 Dimethylarsinic acid
CAS No. 917-76-0
- 265 Monomethylarsonic acid
CAS No. 65513-69-1
- 269 Trimethylarsine oxide
CAS No. 4964-14-1
- 273 Barium
CAS No. 81-25-4
- 279 Beryllium
CAS No. 7440-41-7
- 283 Cadmium
CAS No. 81271-94-5
- 292 Cesium
CAS No. 7440-46-2
- 298 Chromium
- 299 Cobalt
- 306 Copper
CAS No. 7440-50-8
- 307 Lead
CAS No. 7439-92-1
- 316 Manganese
CAS No. 8075-39-6
- 319 Mercury
CAS No. 92786-62-4
- 330 Molybdenum
CAS No. 7439-98-7
- 336 Platinum
CAS No. 7740-106-4
- 340 Selenium
CAS No. 7782-49-2
- 342 Strontium
CAS No. 7440-24-6
- 344 Thallium
CAS No. 7440-28-0
- 350 Tin
CAS No. 7440-31-5
- 352 Tungsten
CAS No. 7440-33-7
- 358 Uranium
CAS No. 7440-61-1
- 364 Zinc
CAS No. 7440-66-6

Perchlorate and Other Anions

- 365 Nitrate
CAS No. 84145-82-4
- 369 Perchlorate
CAS No. 14797-73-0
- 375 Thiocyanate
CAS No. 302-04-5

Perfluoroalkyl and Polyfluoroalkyl Substances: Surfactants

- 379 Perfluorobutane sulfonic acid (PFBS)
CAS No. 375-73-5

- 383 Perfluorodecanoic acid (PFDA)
CAS No. 335-76-2
- 387 Perfluorododecanoic acid (PFDoA)
CAS No. 307-55-1
- 391 Perfluoroheptanoic acid (PFHpA)
CAS No. 375-85-9
- 395 Perfluorohexane sulfonic acid (PFHxS)
CAS No. 355-46-4
- 399 Perfluorononanoic acid (PFNA)
CAS No. 375-95-1
- 403 Perfluorooctanoic acid (PFOA)
CAS No. 335-67-1
- 407 *n*-Perfluorooctanoic acid (*n*-PFOA)
- 409 Branched Perfluorooctanoic isomers (Sb-PFOA)
- 411 Perfluorooctane sulfonic acid (PFOS)
CAS No. 1763-23-1
- 415 *n*-Perfluorooctane sulfonic acid (*n*-PFOS)
- 417 Perfluoromethylheptane sulfonic acid isomers (Sm-PFOS)
- 419 Perfluorooctane sulfonamide (PFOSA or FOSA)
CAS No. 754-91-6
- 423 2-(*N*-Ethyl-perfluorooctane sulfonamido) acetic acid (EtFOSAA)
CAS No. 2991-50-6
- 427 2-(*N*-Methyl-perfluorooctane sulfonamido) acetic acid (MeFOSAA)
CAS No. 2355-31-9
- 431 Perfluoroundecanoic acid (PFUnDA)
CAS No. 2058-94-8

Phthalate and Phthalate Alternative Metabolites

- 435 Mono-benzyl phthalate (MBzP)
CAS No. 2528-16-7
- 441 Mono-3-hydroxybutyl phthalate (MHBP)
- 443 Mono-*n*-butyl phthalate (MnBP)
CAS No. 131-70-4
- 449 Mono-isobutyl phthalate (MiBP)
CAS No. 30833-53-5
- 455 Mono-2-methyl-2-hydroxypropyl phthalate (MHiBP)
- 457 Mono-cyclohexyl phthalate (MCHP)
CAS No. 7517-36-4
- 461 Mono-ethyl phthalate (MEP)
CAS No. 863029-89-4
- 467 Mono-2-ethylhexyl phthalate (MEHP)
CAS No. 4376-20-9
- 473 Mono-(2-ethyl-5-hydroxyhexyl) phthalate (MEHHP)
CAS No. 40321-99-1
- 479 Mono-(2-ethyl-5-oxohexyl) phthalate (MEOHP)
CAS No. 40321-98-0
- 485 Mono-(2-ethyl-5-carboxypentyl) phthalate (MECPP)
CAS No. 40809-41-4
- 489 Mono-(carboxynonyl) phthalate (MCNP)
CAS No. 1373125-93-9
- 493 Mono-isononyl phthalate (MiNP)
CAS No. 297182-83-3

- 499 Mono-(carboxyoctyl) phthalate (MCOP)
CAS No. Di-isononyl phthalate (DNP)
- 503 Mono-methyl phthalate (MMP)
CAS No. 4376-18-5
- 509 Mono-(3-carboxypropyl) phthalate (MCP)P
CAS No. 66851-46-5
- 515 Mono-*n*-octyl phthalate (MOP)
CAS No. 5393-19-1
- 519 Cyclohexane-1,2-dicarboxylic acid mono(hydroxy-isononyl ester) (MHNCH)

Phytoestrogens and Metabolites

- 521 Daidzein
CAS No. 486-66-8
- 525 Enterodiol
CAS No. 80226-00-2
- 529 Enterolactone
CAS No. 77756-20-8
- 533 Equol
CAS No. 531-95-3
- 537 Genistein
CAS No. 446-72-0
- 541 O-Desmethylangolensin
CAS No. 21255-69-6

Polycyclic Aromatic Hydrocarbon Metabolites

- 545 2-Hydroxyfluorene
CAS No. 2443-58-5
- 551 3-Hydroxyfluorene
CAS No. 6344-67-8
- 557 9-Hydroxyfluorene
CAS No. 1689-64-1
- 563 1-Hydroxyphenanthrene
CAS No. 2433-56-9
- 569 2-Hydroxyphenanthrene
CAS No. 605-55-0
- 575 3-Hydroxyphenanthrene
CAS No. 605-87-8
- 581 2 + 3-Hydroxyphenanthrene
- 583 4-Hydroxyphenanthrene
CAS No. 7657-86-7
- 587 1-Hydroxypyrene
CAS No. 5315-79-7
- 593 1-Hydroxynaphthalene (1-Naphthol)
CAS No. 90-15-3
- 599 2-Hydroxynaphthalene (2-Naphthol)
CAS No. 135-19-3

Heterocyclic Amines

- 605 3-Amino-1,4-dimethyl-5H-pyrido[4,3-b]indole (Trp-P-1)
- 607 2-Amino-3-methyl-9H-pyrido[2,3-b]indole (MeA- α -C)
- 609 2-Amino-1-methyl-6-phenylimidazo[4,5-b]pyridine (Ph1P)
- 611 2-Amino-9H-pyrido[2,3-b]indole (A- α -C)

- 613 2-Amino-3-methylimidazo[4,5-f]quinoline (IQ)
- 615 2-Amino-6-methyldipyrido[1,2-a:3',2'-d]imidazole (Glu-P1)
- 617 2-Aminodipyrido[1,2-a:3',2'-d]imidazole (GLU-P2)
- 619 Harman
- 621 1-Methyl-3-amino-5H-pyrido[4,3-b]indole (Trp-P-2)
- 623 Norharman

Volatile Organic Compounds (VOCs)

- 625 1,1,1-Trichloroethane (Methyl chloroform)
CAS No. 71-55-6
- 627 1,1,1,2-Tetrachloroethane
CAS No. 79-34-5
- 629 1,1,2,2-Tetrachloroethane
CAS No. 79-34-5
- 631 1,1,2-Trichloroethane
CAS No. 79-00-5
- 633 1,2,3-Trichloropropane
CAS No. 96-18-4
- 635 1,1-Dichloroethane
CAS No. 75-34-3
- 637 1,1-Dichloroethene (Vinylidene chloride)
CAS No. 75-34-3
- 639 1,2-Dibromo-3-chloropropane (DBCP)
CAS No. 96-12-8
- 640 1,2-Dibromoethane
CAS No. 106-93-4
- 642 1,2-Dichlorobenzene (*o*-Dichlorobenzene)
CAS No. 95-50-1
- 644 1,2-Dichloroethane (Ethylene dichloride)
CAS No. 107-06-2
- 646 *cis*-1,2-Dichloroethene
CAS No. 156-59-2
- 648 *trans*-1,2-Dichloroethene
CAS No. 156-60-5
- 650 1,2-Dichloropropane
CAS No. 78-87-5
- 652 1,3-Dichlorobenzene (*m*-Dichlorobenzene)
CAS No. 95-50-1
- 654 1,4-Dichlorobenzene (Paradichlorobenzene)
CAS No. 106-46-7
- 656 1,4-Dioxane
- 658 2,5-Dimethylfuran
CAS No. 625-86-5
- 660 Benzene
CAS No. 71-43-2
- 662 Chlorobenzene (Monochlorobenzene)
CAS No. 108-90-7
- 664 Chloroethane
- 665 Cyclohexane
- 666 Dibromomethane
CAS No. 74-95-3

- 668 Dichloromethane (Methylene chloride)
CAS No. 75-09-2
- 670 Ethyl acetate
- 671 Diethylether
- 672 Ethylbenzene
CAS No. 100-41-4
- 674 Furan
CAS No. 110-00-9
- 676 Heptane
- 677 Hexachloroethane
CAS No. 67-72-1
- 679 Hexane
- 681 Isopropylbenzene (Cumene)
CAS No. 98-82-8
- 683 Methyl-*tert*-butyl ether (MTBE)
CAS No. 1634-04-4
- 685 Methylcyclopentane
- 686 Nitrobenzene
CAS No. 98-95-3
- 688 Nitromethane
CAS No. 75-52-5
- 689 Octane
- 690 Styrene
CAS No. 100-42-5
- 691 Tetrachloroethene (Perchloroethylene)
CAS No. 127-18-4
- 693 Tetrachloromethane (Carbon tetrachloride)
CAS No. 56-23-5
- 695 Tetrahydrofuran
- 696 Toluene
CAS No. 108-88-3
- 698 Trichloroethene (Trichloroethylene)
CAS No. 79-01-6
- 700 ***ααα*-Trifluorotoluene**
- 701 Vinyl bromide
- 702 *m/p*-Xylene
CAS No. 108-38-3/106-42-3
- 704 *o*-Xylene
CAS No. 95-47-6

Volatile Organic Compound (VOC) Metabolites

- 706 N-Acetyl-S-(2-carboxyethyl)-L-cysteine
CAS No. 51868-61-2
- 710 N-Acetyl-S-(3-hydroxypropyl)-L-cysteine
CAS No. 23127-40-4
- 714 N-Acetyl-S-(2-carbamoyl-ethyl)-L-cysteine
CAS No. 81690-92-8
- 718 N-Acetyl-S-(2-carbamoyl-2-hydroxyethyl)-L-cysteine
- 722 N-Acetyl-S-(2-cyanoethyl)-L-cysteine
CAS No. 74514-75-3
- 726 N-Acetyl-S-(2-hydroxyethyl)-L-cysteine
CAS No. 15060-26-1

- 730 N-Acetyl-S-(phenyl)-L-cysteine
CAS No. 4775-80-8
- 734 N-Acetyl-S-(*n*-propyl)-L-cysteine
- 738 N-Acetyl-S-(3,4-dihydroxybutyl)-L-cysteine
CAS No. 144889-50-9
- 742 N-Acetyl-S-(1-hydroxymethyl-2-propenyl)-L-cysteine
- 746 N-Acetyl-S-(2-hydroxy-3-butenyl)-L-cysteine
CAS No. 159092-64-5
- 750 N-Acetyl-S-(4-hydroxy-2-butenyl)-L-cysteine
CAS No. 159092-65-6
- 754 2-Thioxothiazolidine-4-carboxylic acid
CAS No. 20933-67-9
- 758 N-Acetyl-S-(3-hydroxypropyl-1-methyl)-L-cysteine
CAS No. 33164-70-4
- 762 2-Aminothiazoline-4-carboxylic acid
CAS No. 40283-41-8
- 766 N-Acetyl-S-(N-methylcarbamoyl)-L-cysteine
CAS No. 103974-29-4
- 770 Phenylglyoxylic acid
CAS No. 611-73-4
- 774 N-Acetyl-S-(2-hydroxypropyl)-L-cysteine
CAS No. 923-43-3
- 778 N-Acetyl-S-(phenyl-2-hydroxyethyl)-L-cysteine
- 782 Mandelic acid
CAS No. 90-64-2, 611-71-2 (R), 17199-29-0 (S)
- 786 N-Acetyl-S-(trichlorovinyl)-L-cysteine
CAS No. 111348-61-9
- 790 N-Acetyl-S-(benzyl)-L-cysteine
CAS No. 19542-77-9
- 794 N-Acetyl-S-(1,2-dichlorovinyl)-L-cysteine
CAS No. 2148-31-4
- 798 N-Acetyl-S-(2,2-dichlorovinyl)-L-cysteine
CAS No. 126543-43-9
- 802 N-Acetyl-S-(dimethylphenyl)-L-cysteine
- 806 2-Methylhippuric acid
CAS No. 42013-20-7
- 810 3- and 4-Methylhippuric acid
CAS No. 27115-49-7, 27115-50-0

Appendices

- 814 Appendix A
- 818 Appendix C
- 833 Appendix D

Volume Two

Special Analysis of Pooled Samples for Select Chemicals

- 1 Special Analysis of Pooled Samples for Select Chemicals

Organochlorine Pesticides and Metabolites (Pooled Samples after 2004)

- 3 Aldrin
CAS No. 309-00-2
- 5 Dieldrin
CAS No. 60-57-1
- 7 Endrin
CAS No. 72-20-8
- 9 Heptachlor epoxide
CAS No. 1024-57-3
- 11 Oxychlorane
CAS No. 27304-13-8
- 19 *trans*-Nonachlor
CAS No. 39765-80-5
- 27 *p,p'*-DDT
CAS No. 50-29-3
- 35 *p,p'*-DDE
CAS No. 72-55-9
- 43 *o,p'*-DDT
- 45 Hexachlorobenzene
CAS No. 118-74-1
- 53 *beta*-Hexachlorocyclohexane
CAS No. 319-85-7
- 61 *gamma*-Hexachlorocyclohexane
- 69 Mirex
CAS No. 2385-85-5

Polybrominated Diphenyl Ethers and PBB 153 (Pooled Samples after 2004)

- 79 2,2',4'-Tribromodiphenyl ether (BDE 17)
CAS No. 147217-75-2
- 83 2,4,4'-Tribromodiphenyl ether (BDE 28)
CAS No. 41318-75-6
- 87 2,2',4,4'-Tetrabromodiphenyl ether (BDE 47)
CAS No. 5436-43-1
- 91 2,3',4,4'-Tetrabromodiphenyl ether (BDE 66)
CAS No. 189084-61-5
- 95 2,2',3,4,4'-Pentabromodiphenyl ether (BDE 85)
CAS No. 182346-21-0
- 99 2,2',4,4',5'-Pentabromodiphenyl ether (BDE 99)
CAS No. 60328-60-9
- 103 2,2',4,4',6'-Pentabromodiphenyl ether (BDE 100)
CAS No. 189084-64-8
- 107 2,2',4,4',5,5'-Hexabromodiphenyl ether (BDE 153)
CAS No. 68631-49-2
- 111 2,2',4,4',5,6'-Hexabromodiphenyl ether (BDE 154)
CAS No. 207122-15-4
- 115 2,2',3,4,4',5',6'-Heptabromodiphenyl ether (BDE 183)
CAS No. 207122-16-5
- 119 2,2',3,3',4,4',5,5',6,6'-Decabromodiphenyl ether (BDE 209)
CAS No. 1163-19-5
- 122 2,2',4,4',5,5'-Hexabromobiphenyl (PBB 153)
CAS No. 59080-40-9

Polychlorinated Dibenzo-*p*-dioxins (Pooled Samples after 2004)

- 126 1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin (HpCDD)

- 134 1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin (HxCDD)
CAS No. 39227-28-6
- 142 1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin (HxCDD)
CAS No. 57653-85-7
- 150 1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin (HxCDD)
CAS No. 19408-74-3
- 158 1,2,3,4,6,7,8,9-Octachlorodibenzo-*p*-dioxin (OCDD)
CAS No. 3268-87-9
- 166 1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin (PeCDD)
CAS No. 40321-76-4
- 174 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin (TCDD)
CAS No. 1746-01-6

Polychlorinated Dibenzofurans (Pooled Samples after 2004)

- 182 1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)
CAS No. 67562-39-4
- 190 1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)
CAS No. 55673-89-7
- 198 1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)
CAS No. 70648-26-9
- 206 1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)
CAS No. 57117-44-9
- 214 1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)
CAS No. 72918-21-9
- 222 2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)
CAS No. 60851-34-5
- 230 1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)
CAS No. 39001-02-0
- 238 1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)
CAS No. 57117-41-6
- 246 2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)
CAS No. 57117-31-4
- 254 2,3,7,8-Tetrachlorodibenzofuran (TCDF)
CAS No. 51207-31-9

Dioxin-like Polychlorinated Biphenyls: coplanar PCBs (Pooled Samples after 2004)

- 262 3,4,4',5'-Tetrachlorobiphenyl (PCB 81)
CAS No. 70362-50-4
- 270 3,3',4,4',5'-Pentachlorobiphenyl (PCB 126)
CAS No. 57465-28-8
- 278 3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169)
CAS No. 32774-16-6

Dioxin-like Polychlorinated Biphenyls: mono-*ortho*-substituted PCBs (Pooled Samples after 2004)

- 286 2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)
CAS No. 32598-14-4
- 294 2,3,3',4,4'-Pentachlorobiphenyl (PCB 114)
CAS No. 74472-37-0
- 300 2,3',4,4',5-Pentachlorobiphenyl (PCB 118)
CAS No. 31508-00-6
- 308 2',3,4,4',5-Pentachlorobiphenyl (PCB 123)
CAS No. 65510-44-3
- 312 2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156)
CAS No. 38380-08-4

- 320 2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157)
CAS No. 69782-90-7
- 328 2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167)
CAS No. 52663-72-6
- 336 **2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189)**
CAS No. 39635-31-9

Polychlorinated Biphenyls: Non-Dioxin-Like (Pooled Samples after 2004)

- 344 2,4,4'-Trichlorobiphenyl (PCB 28)
CAS No. 7012-37-5
- 352 2,2',3,5'-Tetrachloro biphenyl (PCB 44)
CAS No. 41464-39-5
- 358 2,2',4,5'-Tetrachloro biphenyl (PCB 49)
CAS No. 41464-40-8
- 364 2,2',5,5'-Tetrachlorobiphenyl (PCB 52)
CAS No. 35693-99-3
- 370 2,3',4,4'-Tetrachlorobiphenyl (PCB 66)
CAS No. 33025-41-1
- 378 2,4,4',5-Tetrachlorobiphenyl (PCB 74)
CAS No. 32690-93-0
- 386 2,2',3,4,5'-Pentachlorobiphenyl (PCB 87)
CAS No. 41464-51-1
- 392 2,2',4,4',5-Pentachlorobiphenyl (PCB 99)
CAS No. 38380-02-8
- 400 2,2',4,5,5'-Pentachlorobiphenyl (PCB 101)
CAS No. 37680-73-2
- 406 **2,3,3',4',6-Pentachlorobiphenyl (PCB 110)**
CAS No. 74472-35-8
- 412 2,2',3,3',4,4'-Hexachlorobiphenyl (PCB 128)
CAS No. 38380-07-3
- 418 **2,2',3,4,4',5' and 2,3,3',4,4',6-Hexachlorobiphenyl (PCB 138 & 158)**
CAS No. 52712-04-6 and 74472-42-7
- 426 2,2',3,4,5,5'-Hexachlorobiphenyl (PCB 146)
CAS No. 51908-16-8
- 434 **2,2',3,4,5',6-Hexachlorobiphenyl (PCB 149)**
CAS No. 38380-04-0
- 440 **2,2',3,5,5',6-Hexachlorobiphenyl (PCB 151)**
CAS No. 52663-63-5
- 446 2,2',4,4',5,5'-Hexachlorobiphenyl (PCB 153)
CAS No. 35065-27-1
- 454 2,2',3,3',4,4',5-Heptachlorobiphenyl (PCB 170)
CAS No. 35065-30-6
- 462 2,2',3,3',4,5,5'-Heptachlorobiphenyl (PCB 172)
CAS No. 52663-74-8
- 468 2,2',3,3',4,5',6'-Heptachlorobiphenyl (PCB 177)
CAS No. 40186-70-7
- 474 2,2',3,3',5,5',6-Heptachlorobiphenyl (PCB 178)
CAS No. 52663-67-9
- 482 2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB 180)
CAS No. 35065-29-3
- 490 2,2',3,4,4',5',6-Heptachlorobiphenyl (PCB 183)
CAS No. 52663-69-1
- 498 2,2',3,4,5,5',6-Heptachlorobiphenyl (PCB 187)
CAS No. 52663-68-0

- 506 **2,2',3,3',4,4',5,5'-Octachlorobiphenyl (PCB 194)**
CAS No. 35694-08-7
- 514 **2,2',3,3',4,4',5,6-Octachlorobiphenyl (PCB 195)**
CAS No. 52663-78-2
- 520 **2,2',3,3',4,4',5,6' and 2,2',3,4,4',5,5',6-Octachlorobiphenyl (PCB 196 & 203)**
CAS No. 42740-50-1 and 52663-76-0
- 528 **2,2',3,3',4,5,5',6-Octachlorobiphenyl (PCB 199)**
CAS No. 52663-73-7
- 536 **2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (PCB 206)**
CAS No. 40186-72-9
- 544 **2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl (PCB 209)**
CAS No. 2051-24-3

Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults

- 551 Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Analysis of Select Chemicals in a Special Sample

Metals and Metalloids (Special Sample: Adult Smokers & Nonsmokers)

- 552 Antimony
CAS No. 7440-36-0
- 554 Arsenic, Total
CAS No. 7440-38-2
- 556 Arsenic (V) acid
- 558 Arsenobetaine
CAS No. 64436-13-1
- 560 Arsenocholine
CAS No. 96055-45-7
- 562 Arsenous (III) acid
CAS No. 13464-58-9
- 564 Dimethylarsinic acid
CAS No. 917-76-0
- 566 Monomethylarsonic acid
CAS No. 65513-69-1
- 568 Trimethylarsine oxide
CAS No. 4964-14-1
- 570 Barium
CAS No. 81-25-4
- 572 Cadmium
CAS No. 81271-94-5
- 574 Cesium
CAS No. 7440-46-2
- 576 Cobalt
CAS No. 7440-48-4
- 578 Lead
CAS No. 7439-92-1
- 580 Manganese
CAS No. 8075-39-6
- 582 Molybdenum
CAS No. 7439-98-7
- 584 Strontium
CAS No. 7440-24-6
- 586 Thallium
CAS No. 7440-28-0
- 588 Tin
CAS No. 7440-31-5

590 Tungsten
CAS No. 7440-33-7

592 Uranium
CAS No. 7440-61-1

Perchlorate and Other Anions (Special Sample: Adult Smokers & Nonsmokers)

594 Nitrate
CAS No. 84145-82-4

596 Perchlorate
CAS No. 14797-73-0

598 Thiocyanate
CAS No. 302-04-5

Polycyclic Aromatic Hydrocarbon Metabolites (Adult Cigarette Smokers & Nonsmokers: Special Sample)

600 2-Hydroxyfluorene
CAS No. 2443-58-5

602 3-Hydroxyfluorene
CAS No. 6344-67-8

604 9-Hydroxyfluorene
CAS No. 1689-64-1

606 1-Hydroxyphenanthrene
CAS No. 2433-56-9

608 2-Hydroxyphenanthrene
CAS No. 605-55-0

610 3-Hydroxyphenanthrene
CAS No. 605-87-8

612 4-Hydroxyphenanthrene
CAS No. 7657-86-7

614 1-Hydroxypyrene
CAS No. 5315-79-7

616 1-Hydroxynaphthalene (1-Naphthol)
CAS No. 90-15-3

618 2-Hydroxynaphthalene (2-Naphthol)
CAS No. 135-19-3

Heterocyclic Amines

620 3-Amino-1,4-dimethyl-5H-pyrido[4,3-b]indole (Trp-P-1)

622 2-Amino-3-methyl-9H-pyrido[2,3-b]indole (MeA- α -C)

624 2-Amino-1-methyl-6-phenylimidazo[4,5-b]pyridine (Ph1P)

626 2-Amino-9H-pyrido[2,3-b]indole (A- α -C)

628 2-Amino-3-methylimidazo[4,5-f]quinoline (IQ)

630 2-Amino-6-methyldipyrido[1,2-a:3',2'-d]imidazole (Glu-P1)

632 2-Aminodipyrido[1,2-a:3',2'-d]imidazole (GLU-P2) Harman

634 1-Methyl-3-amino-5H-pyrido[4,3-b]indole (Trp-P-2)

636 Norharman

Volatile Organic Compounds (VOC)

640 1,1,1-Trichloroethane (Methyl chloroform)
CAS No. 71-55-6

641 1,1,1,2-Tetrachloroethane
CAS No. 79-34-5

642 1,2,3-Trichloropropane
CAS No. 96-18-4

- 643 1,2-Dibromoethane
CAS No. 106-93-4
- 644 1,2-Dichlorobenzene (*o*-Dichlorobenzene)
CAS No. 95-50-1
- 645 1,2-Dichloroethane (Ethylene dichloride)
CAS No. 107-06-2
- 646 1,3-Dichlorobenzene (*m*-Dichlorobenzene)
CAS No. 95-50-1
- 647 1,4-Dichlorobenzene (Paradichlorobenzene)
CAS No. 106-46-7
- 648 1,4-Dioxane
- 649 2,5-Dimethylfuran
CAS No. 625-86-5
- 650 Benzene
CAS No. 71-43-2
- 651 Bromodichloromethane
- 652 Chlorobenzene (Monochlorobenzene)
CAS No. 108-90-7
- 653 Chloroethane
- 654 Cyclohexane
- 655 Dibromochloromethane
- 656 Dichloromethane (Methylene chloride)
CAS No. 75-09-2
- 657 Diethylether
- 658 Ethyl acetate
- 659 Ethylbenzene
CAS No. 100-41-4
- 660 Furan
CAS No. 110-00-9
- 661 Heptane
- 662 Hexane
- 663 Isopropylbenzene (Cumene)
CAS No. 98-82-8
- 664 Methyl-*tert*-butyl ether (MTBE)
CAS No. 1634-04-4
- 665 Methylcyclopentane
- 666 Nitrobenzene
CAS No. 98-95-3
- 667 Octane
- 668 Tetrachloroethene (Perchloroethylene)
CAS No. 127-18-4
- 669 Tetrachloromethane (Carbon tetrachloride)
CAS No. 56-23-5
- 670 Tetrahydrofuran
- 671 Toluene
CAS No. 108-88-3
- 672 Tribromomethane (Bromoform)
- 673 Trichloroethene (Trichloroethylene)
CAS No. 79-01-6
- 674 Trichloromethane (Chloroform)

675 $\alpha\alpha\alpha$ -Trifluorotoluene

676 Vinyl bromide

677 *m/p*-Xylene

CAS No. 108-38-3/106-42-3

678 *o*-Xylene

CAS No. 95-47-6

Volatile Organic Compound (VOC) Metabolites (Special Sample: Adult Smokers & Nonsmokers)

679 N-Acetyl-S-(2-carboxyethyl)-L-cysteine

CAS No. 51868-61-2

681 N-Acetyl-S-(3-hydroxypropyl)-L-cysteine

CAS No. 23127-40-4

683 N-Acetyl-S-(2-carbamoyl-ethyl)-L-cysteine

CAS No. 81690-92-8

685 N-Acetyl-S-(2-carbamoyl-2-hydroxyethyl)-L-cysteine

687 N-Acetyl-S-(2-cyanoethyl)-L-cysteine

CAS No. 74514-75-3

689 N-Acetyl-S-(2-hydroxyethyl)-L-cysteine

CAS No. 15060-26-1

691 N-Acetyl-S-(phenyl)-L-cysteine

CAS No. 4775-80-8

693 N-Acetyl-S-(*n*-propyl)-L-cysteine

695 N-Acetyl-S-(3,4-dihydroxybutyl)-L-cysteine

CAS No. 144889-50-9

697 N-Acetyl-S-(1-hydroxymethyl-2-propenyl)-L-cysteine

699 N-Acetyl-S-(2-hydroxy-3-butenyl)-L-cysteine

CAS No. 159092-64-5

701 N-Acetyl-S-(4-hydroxy-2-butenyl)-L-cysteine

CAS No. 159092-65-6

703 2-Thioxothiazolidine-4-carboxylic acid

CAS No. 20933-67-9

705 N-Acetyl-S-(3-hydroxypropyl-1-methyl)-L-cysteine

CAS No. 33164-70-4

707 2-Aminothiazoline-4-carboxylic acid

CAS No. 40283-41-8

709 N-Acetyl-S-(*N*-methylcarbamoyl)-L-cysteine

CAS No. 103974-29-4

711 Phenylglyoxylic acid

CAS No. 611-73-4

713 N-Acetyl-S-(2-hydroxypropyl)-L-cysteine

CAS No. 923-43-3

715 N-Acetyl-S-(phenyl-2-hydroxyethyl)-L-cysteine

717 Mandelic acid

CAS No. 90-64-2, 611-71-2 (R), 17199-29-0 (S)

719 N-Acetyl-S-(trichlorovinyl)-L-cysteine

CAS No. 111348-61-9

721 N-Acetyl-S-(benzyl)-L-cysteine

CAS No. 19542-77-9

723 N-Acetyl-S-(1,2-dichlorovinyl)-L-cysteine

CAS No. 2148-31-4

725 N-Acetyl-S-(2,2-dichlorovinyl)-L-cysteine

CAS No. 126543-43-9

727 N-Acetyl-S-(dimethylphenyl)-L-cysteine

729 2-Methylhippuric acid

CAS No. 42013-20-7

731 3- & 4-Methylhippuric acid

CAS No. 27115-49-7, 27115-50-0

Appendices

733 Appendix A

737 Appendix C

752 Appendix D

Special Analysis of Pooled Samples for Select Chemicals

Background

In the National Biomonitoring Program, the decision to pool samples before making chemical measurements has been driven by at least two factors:

- The need to improve the sensitivity of the measurement; that is, the chemical concentrations are so low that a larger sample volume is necessary to achieve lower limits of detection and greater likelihood of detectable results; and
- The need to reduce the number of samples analyzed, based on weighing the costs of the analysis against a low frequency of detectable results.

Pooled Samples in the *Updated Tables*

This release of the *Updated Tables* includes NHANES 2005-2006 and 2007-2008 results for chemicals that were measured in samples created from pools of serum samples. The historical data tables for these chemicals with results for NHANES survey periods prior to 2005-2006 are included and show results for individual sample measurements. Each historical data table is presented before its corresponding pooled sample data table. PCBs 114 and 123 and the brominated flame retardant BDE 209 were not measured prior to NHANES 2005-2006; therefore, for these chemicals only the pooled data tables are presented. In addition, five organochlorine pesticides were not measured after NHANES 2003-2004, so there are no pooled data tables for these chemicals.

Overview of Sample Pooling

Beginning with NHANES 2005-2006, the CDC is using a weighted pooled-sample design to measure serum concentrations of dioxins, furans, polychlorinated biphenyls (PCBs), organochlorine pesticides and metabolites, and the brominated flame retardants (polybrominated diphenyl ethers and the polybrominated diphenyl, PBB 153). In previous NHANES survey periods, measurements were made on individual serum samples from the U.S. population using stratified multistage selection.

Although NHANES sampling weights can be incorporated to make pooled sample estimates representative of the non-institutionalized U.S. population, there are statistical estimation challenges. Measurements of these chemicals in individuals tend to have a log-normal distribution with central tendency best estimated using a geometric mean. However, the measured value for a pooled sample is comparable to an arithmetic average of measurements in individuals. Consequently, the pooled sample result is expected to be higher than the geometric mean of multiple individual results. Another challenge is that direct calculation of the design effects required for accurate standard error and confidence interval estimation is not possible because samples are pooled across the design cells of the original survey. For these reasons, data tables showing the pooled sample results present only weighted arithmetic means and unadjusted standard errors for each category.

Interpreting the Data

The following cautions and suggestions apply to the pooled sample results and data tables:

a) Individual sample data, as explained above, tend to be log-normally distributed with central tendency best estimated using a geometric mean. Pooled data are comparable to an arithmetic mean of individual sample results and therefore, pooled data results are expected to be higher than the geometric mean of individual sample results. Therefore, the weighted arithmetic means from pooled samples are expected to be higher than the geometric means provided in the historical (companion) data tables or in other publications based on data provided on individual results.

b) The standard errors are unadjusted and therefore, do not reflect the design effects of the survey. In many cases, the standard errors are based on very few pooled sample measurements and cannot be expected to accurately reflect the true imprecision of the weighted arithmetic mean estimates. Therefore, when the unadjusted standard error was more than 30% of the weighted arithmetic mean, this is noted with a double asterisk (**) and footnoted.

Additional information about sample pooling is available from the following sources:

Geometric mean estimation from pooled samples (2007)

<http://www.ncbi.nlm.nih.gov/pubmed/17618673>

Characterizing populations of individuals using pooled samples (2010)

<http://www.ncbi.nlm.nih.gov/pubmed/19002216>

Use of pooled samples from the National Health and Nutrition Examination Survey (2012)

<http://www.ncbi.nlm.nih.gov/pubmed/22492247>

Estimation of exposure distributions from pooled samples (2014)

<http://www.ncbi.nlm.nih.gov/pubmed/25213192>

Confidence interval estimation of pooled sample results from a complex survey design (2015)

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4648671/>

Serum Aldrin (lipid adjusted) (2001 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	01-02	*	< LOD	< LOD	< LOD	< LOD	2275
	03-04	*	< LOD	< LOD	< LOD	< LOD	1946
Age group 12-19 years	01-02	*	< LOD	< LOD	< LOD	< LOD	756
	03-04	*	< LOD	< LOD	< LOD	< LOD	588
20 years and older	01-02	*	< LOD	< LOD	< LOD	< LOD	1519
	03-04	*	< LOD	< LOD	< LOD	< LOD	1358
Gender Males	01-02	*	< LOD	< LOD	< LOD	< LOD	1057
	03-04	*	< LOD	< LOD	< LOD	< LOD	946
Females	01-02	*	< LOD	< LOD	< LOD	< LOD	1218
	03-04	*	< LOD	< LOD	< LOD	< LOD	1000
Race/ethnicity Mexican Americans	01-02	*	< LOD	< LOD	< LOD	< LOD	559
	03-04	*	< LOD	< LOD	< LOD	< LOD	456
Non-Hispanic blacks	01-02	*	< LOD	< LOD	< LOD	< LOD	512
	03-04	*	< LOD	< LOD	< LOD	< LOD	485
Non-Hispanic whites	01-02	*	< LOD	< LOD	< LOD	< LOD	1045
	03-04	*	< LOD	< LOD	< LOD	< LOD	881

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02 and 03-04 are 5.94 and 7.8.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Serum Aldrin (whole weight) (2001 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	01-02	*	< LOD	< LOD	< LOD	< LOD	2275
	03-04	*	< LOD	< LOD	< LOD	< LOD	1946
Age group 12-19 years	01-02	*	< LOD	< LOD	< LOD	< LOD	756
	03-04	*	< LOD	< LOD	< LOD	< LOD	588
20 years and older	01-02	*	< LOD	< LOD	< LOD	< LOD	1519
	03-04	*	< LOD	< LOD	< LOD	< LOD	1358
Gender Males	01-02	*	< LOD	< LOD	< LOD	< LOD	1057
	03-04	*	< LOD	< LOD	< LOD	< LOD	946
Females	01-02	*	< LOD	< LOD	< LOD	< LOD	1218
	03-04	*	< LOD	< LOD	< LOD	< LOD	1000
Race/ethnicity Mexican Americans	01-02	*	< LOD	< LOD	< LOD	< LOD	559
	03-04	*	< LOD	< LOD	< LOD	< LOD	456
Non-Hispanic blacks	01-02	*	< LOD	< LOD	< LOD	< LOD	512
	03-04	*	< LOD	< LOD	< LOD	< LOD	485
Non-Hispanic whites	01-02	*	< LOD	< LOD	< LOD	< LOD	1045
	03-04	*	< LOD	< LOD	< LOD	< LOD	881

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Serum Dieldrin (lipid adjusted) (2001 – 2004)

Also a Metabolite of Aldrin

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	01-02	*	< LOD	< LOD	15.3 (14.5-17.4)	20.3 (18.7-22.4)	2159
	03-04	*	< LOD	9.00 (8.40-9.90)	14.4 (12.1-16.4)	19.0 (15.8-24.2)	1952
Age group 12-19 years	01-02	*	< LOD	< LOD	< LOD	< LOD	716
	03-04	*	< LOD	< LOD	< LOD	9.10 (<LOD-16.4)	587
20 years and older	01-02	*	< LOD	10.5 (<LOD-11.6)	16.6 (15.1-18.2)	21.3 (19.1-24.0)	1443
	03-04	*	< LOD	9.50 (8.80-10.4)	14.9 (12.8-17.0)	19.5 (16.0-25.7)	1365
Gender Males	01-02	*	< LOD	< LOD	15.7 (14.4-18.7)	20.3 (18.6-24.0)	1007
	03-04	*	< LOD	9.30 (8.40-10.8)	15.1 (13.1-19.1)	21.9 (14.9-38.5)	954
Females	01-02	*	< LOD	< LOD	15.3 (13.4-17.2)	19.8 (18.0-21.6)	1152
	03-04	*	< LOD	8.70 (7.80-9.50)	12.8 (11.2-15.4)	16.9 (13.9-22.4)	998
Race/ethnicity Mexican Americans	01-02	*	< LOD	< LOD	11.7 (<LOD-15.1)	15.4 (12.7-19.1)	539
	03-04	*	< LOD	< LOD	10.8 (9.00-14.1)	14.0 (10.6-24.1)	456
Non-Hispanic blacks	01-02	*	< LOD	< LOD	15.0 (11.8-19.1)	20.6 (15.8-25.2)	484
	03-04	*	< LOD	8.80 (<LOD-10.1)	13.0 (10.5-15.8)	15.9 (13.3-21.5)	487
Non-Hispanic whites	01-02	*	< LOD	< LOD	15.6 (14.8-17.8)	21.1 (18.9-23.6)	980
	03-04	*	< LOD	9.30 (8.60-10.2)	14.9 (12.5-17.5)	19.7 (15.6-33.4)	885

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02 and 03-04 are 10.5 and 7.8.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Serum Dieldrin (whole weight) (2001 – 2004)

Metabolite of Aldrin

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	01-02	*	< LOD	< LOD	.110 (.100-.120)	.150 (.130-.170)	2159
	03-04	*	< LOD	.059 (.054-.064)	.098 (.083-.112)	.138 (.109-.177)	1952
Age group 12-19 years	01-02	*	< LOD	< LOD	< LOD	< LOD	716
	03-04	*	< LOD	< LOD	< LOD	.048 (<LOD-.093)	587
20 years and older	01-02	*	< LOD	.070 (<LOD-.080)	.120 (.110-.130)	.160 (.140-.180)	1443
	03-04	*	< LOD	.062 (.056-.069)	.102 (.088-.117)	.139 (.112-.182)	1365
Gender Males	01-02	*	< LOD	< LOD	.120 (.100-.130)	.160 (.130-.190)	1007
	03-04	*	< LOD	.064 (.054-.075)	.109 (.084-.138)	.147 (.108-.242)	954
Females	01-02	*	< LOD	< LOD	.100 (.090-.110)	.140 (.120-.160)	1152
	03-04	*	< LOD	.055 (.049-.060)	.089 (.077-.100)	.110 (.096-.147)	998
Race/ethnicity Mexican Americans	01-02	*	< LOD	< LOD	.090 (<LOD-.100)	.120 (.090-.140)	539
	03-04	*	< LOD	< LOD	.077 (.062-.116)	.113 (.073-.158)	456
Non-Hispanic blacks	01-02	*	< LOD	< LOD	.090 (.070-.110)	.130 (.090-.190)	484
	03-04	*	< LOD	.053 (<LOD-.058)	.080 (.063-.101)	.103 (.080-.149)	487
Non-Hispanic whites	01-02	*	< LOD	< LOD	.110 (.100-.130)	.150 (.130-.180)	980
	03-04	*	< LOD	.062 (.054-.070)	.103 (.086-.124)	.139 (.109-.202)	885

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Serum Endrin (lipid adjusted) (2001 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	01-02	*	< LOD	< LOD	< LOD	5.10 (<LOD-5.40)	2187
	03-04	*	< LOD	< LOD	< LOD	< LOD	1825
Age group 12-19 years	01-02	*	< LOD	< LOD	5.20 (<LOD-5.50)	5.60 (5.40-5.70)	730
	03-04	*	< LOD	< LOD	< LOD	< LOD	539
20 years and older	01-02	*	< LOD	< LOD	< LOD	< LOD	1457
	03-04	*	< LOD	< LOD	< LOD	< LOD	1286
Gender Males	01-02	*	< LOD	< LOD	< LOD	5.20 (<LOD-5.40)	1022
	03-04	*	< LOD	< LOD	< LOD	< LOD	885
Females	01-02	*	< LOD	< LOD	< LOD	< LOD	1165
	03-04	*	< LOD	< LOD	< LOD	< LOD	940
Race/ethnicity Mexican Americans	01-02	*	< LOD	< LOD	< LOD	5.30 (<LOD-6.50)	547
	03-04	*	< LOD	< LOD	< LOD	< LOD	433
Non-Hispanic blacks	01-02	*	< LOD	< LOD	< LOD	5.40 (<LOD-6.30)	487
	03-04	*	< LOD	< LOD	< LOD	< LOD	446
Non-Hispanic whites	01-02	*	< LOD	< LOD	< LOD	5.10 (<LOD-5.40)	1000
	03-04	*	< LOD	< LOD	< LOD	< LOD	831

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02 and 03-04 are 5.09 and 7.8.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Serum Endrin (whole weight) (2001 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	01-02	*	< LOD	< LOD	< LOD	.020 (<LOD-.020)	2187
	03-04	*	< LOD	< LOD	< LOD	< LOD	1825
Age group 12-19 years	01-02	*	< LOD	< LOD	.020 (<LOD-.020)	.020 (.020-.020)	730
	03-04	*	< LOD	< LOD	< LOD	< LOD	539
20 years and older	01-02	*	< LOD	< LOD	< LOD	< LOD	1457
	03-04	*	< LOD	< LOD	< LOD	< LOD	1286
Gender Males	01-02	*	< LOD	< LOD	< LOD	.020 (<LOD-.020)	1022
	03-04	*	< LOD	< LOD	< LOD	< LOD	885
Females	01-02	*	< LOD	< LOD	< LOD	< LOD	1165
	03-04	*	< LOD	< LOD	< LOD	< LOD	940
Race/ethnicity Mexican Americans	01-02	*	< LOD	< LOD	< LOD	.020 (<LOD-.020)	547
	03-04	*	< LOD	< LOD	< LOD	< LOD	433
Non-Hispanic blacks	01-02	*	< LOD	< LOD	< LOD	.020 (<LOD-.020)	487
	03-04	*	< LOD	< LOD	< LOD	< LOD	446
Non-Hispanic whites	01-02	*	< LOD	< LOD	< LOD	.020 (<LOD-.020)	1000
	03-04	*	< LOD	< LOD	< LOD	< LOD	831

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Serum Heptachlor epoxide (lipid adjusted) (1999 – 2004)

Metabolite of Heptachlor

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	15.4 (<LOD-19.8)	24.0 (15.1-38.8)	1589
	01-02	*	< LOD	< LOD	14.8 (13.0-17.8)	21.8 (18.2-27.3)	2259
	03-04	*	< LOD	< LOD	13.4 (11.1-15.9)	18.9 (15.9-23.0)	1963
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	638
	01-02	*	< LOD	< LOD	< LOD	< LOD	741
	03-04	*	< LOD	< LOD	< LOD	< LOD	592
20 years and older	99-00	*	< LOD	< LOD	17.8 (<LOD-23.9)	27.1 (16.8-46.1)	951
	01-02	*	< LOD	< LOD	15.7 (13.7-18.8)	23.1 (19.1-29.1)	1518
	03-04	*	< LOD	8.20 (<LOD-9.50)	14.5 (11.6-17.6)	20.6 (16.8-24.0)	1371
Gender Males	99-00	*	< LOD	< LOD	< LOD	19.6 (<LOD-27.2)	760
	01-02	*	< LOD	< LOD	13.9 (12.0-17.8)	20.8 (15.9-25.3)	1047
	03-04	*	< LOD	< LOD	13.4 (11.2-16.4)	18.6 (16.6-21.3)	956
Females	99-00	*	< LOD	< LOD	18.2 (<LOD-25.2)	27.7 (16.0-54.3)	829
	01-02	*	< LOD	< LOD	15.6 (13.3-18.2)	23.2 (18.9-29.8)	1212
	03-04	*	< LOD	< LOD	13.5 (11.0-16.8)	19.6 (14.8-24.5)	1007
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	15.3 (<LOD-25.6)	22.2 (<LOD-62.3)	598
	01-02	*	< LOD	< LOD	13.2 (<LOD-16.3)	16.8 (13.8-23.1)	553
	03-04	*	< LOD	< LOD	10.6 (8.10-13.5)	13.7 (10.9-16.5)	460
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	19.5 (<LOD-32.4)	336
	01-02	*	< LOD	< LOD	14.6 (11.7-19.0)	21.5 (18.2-27.3)	503
	03-04	*	< LOD	< LOD	13.5 (10.1-16.8)	18.6 (12.7-25.2)	490
Non-Hispanic whites	99-00	*	< LOD	< LOD	16.5 (<LOD-21.8)	26.4 (<LOD-54.3)	539
	01-02	*	< LOD	< LOD	15.3 (13.0-19.6)	22.8 (18.9-29.8)	1041
	03-04	*	< LOD	7.90 (<LOD-9.40)	14.0 (11.2-17.6)	20.4 (15.8-24.5)	888

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 14.6, 10.5, and 7.8, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Serum Heptachlor epoxide (whole weight) (1999 – 2004)

Metabolite of Heptachlor

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	.110 (<LOD-.140)	.180 (.110-.220)	1589
	01-02	*	< LOD	< LOD	.100 (.090-.120)	.150 (.130-.180)	2259
	03-04	*	< LOD	< LOD	.094 (.076-.108)	.128 (.108-.161)	1963
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	638
	01-02	*	< LOD	< LOD	< LOD	< LOD	741
	03-04	*	< LOD	< LOD	< LOD	< LOD	592
20 years and older	99-00	*	< LOD	< LOD	.130 (<LOD-.170)	.190 (.130-.270)	951
	01-02	*	< LOD	< LOD	.110 (.090-.140)	.170 (.140-.190)	1518
	03-04	*	< LOD	.057 (<LOD-.063)	.101 (.082-.116)	.135 (.113-.173)	1371
Gender Males	99-00	*	< LOD	< LOD	< LOD	.150 (<LOD-.180)	760
	01-02	*	< LOD	< LOD	.100 (.090-.120)	.150 (.110-.180)	1047
	03-04	*	< LOD	< LOD	.094 (.077-.111)	.126 (.106-.149)	956
Females	99-00	*	< LOD	< LOD	.120 (<LOD-.190)	.200 (.120-.310)	829
	01-02	*	< LOD	< LOD	.100 (.090-.130)	.170 (.130-.200)	1212
	03-04	*	< LOD	< LOD	.096 (.071-.108)	.133 (.107-.173)	1007
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	.100 (<LOD-.170)	.170 (<LOD-.380)	598
	01-02	*	< LOD	< LOD	.090 (<LOD-.110)	.120 (.100-.240)	553
	03-04	*	< LOD	< LOD	.069 (.053-.097)	.098 (.074-.113)	460
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	.110 (<LOD-.200)	336
	01-02	*	< LOD	< LOD	.090 (.070-.110)	.130 (.100-.180)	503
	03-04	*	< LOD	< LOD	.087 (.067-.104)	.110 (.090-.157)	490
Non-Hispanic whites	99-00	*	< LOD	< LOD	.120 (<LOD-.170)	.180 (<LOD-.310)	539
	01-02	*	< LOD	< LOD	.100 (.090-.130)	.170 (.130-.190)	1041
	03-04	*	< LOD	.055 (<LOD-.063)	.101 (.077-.117)	.135 (.111-.180)	888

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Serum Oxychlordane (lipid adjusted) (1999 – 2004)

Metabolite of Chlordane

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	20.8 (17.8-23.0)	34.4 (30.5-38.6)	44.8 (40.2-49.6)	1661
	01-02	11.4 (<LOD-12.5)	11.1 (<LOD-12.5)	21.7 (19.3-24.4)	36.4 (31.5-41.4)	49.7 (42.0-61.2)	2249
	03-04	9.37 (8.69-10.1)	10.3 (9.20-11.0)	18.0 (16.8-20.1)	29.0 (26.8-32.1)	37.7 (34.8-43.8)	1978
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	663
	01-02	*	< LOD	< LOD	< LOD	11.5 (<LOD-12.6)	752
	03-04	*	< LOD	< LOD	9.20 (<LOD-11.5)	11.5 (8.10-18.9)	595
20 years and older	99-00	*	< LOD	23.3 (21.0-25.9)	37.7 (32.3-43.5)	47.7 (43.1-50.8)	998
	01-02	12.9 (11.7-14.3)	13.3 (11.4-14.9)	23.9 (21.2-26.7)	38.5 (33.4-45.9)	53.1 (44.1-65.9)	1497
	03-04	10.6 (9.82-11.5)	11.4 (10.6-12.4)	19.9 (17.9-21.5)	31.3 (28.8-33.2)	39.2 (36.5-44.8)	1383
Gender Males	99-00	*	< LOD	18.1 (16.1-19.6)	31.3 (25.9-38.2)	42.4 (35.3-49.6)	793
	01-02	11.1 (<LOD-12.6)	11.1 (<LOD-12.6)	20.6 (16.6-24.9)	33.1 (27.5-43.8)	48.1 (40.2-56.9)	1049
	03-04	9.10 (8.20-10.1)	9.90 (8.30-11.2)	17.1 (15.6-18.4)	27.6 (25.3-32.2)	36.0 (32.7-39.2)	963
Females	99-00	*	< LOD	22.3 (20.1-25.9)	36.9 (31.5-40.3)	46.2 (39.1-51.8)	868
	01-02	11.7 (10.7-12.7)	11.0 (<LOD-12.9)	23.1 (20.7-25.0)	37.5 (34.5-42.1)	52.8 (42.7-70.0)	1200
	03-04	9.63 (8.89-10.4)	10.6 (9.10-11.3)	20.1 (17.4-21.7)	30.3 (27.5-32.7)	41.9 (36.3-45.5)	1015
Race/ethnicity Mexican Americans	99-00	*	< LOD	16.3 (<LOD-19.9)	28.9 (18.8-42.0)	39.9 (26.8-61.0)	628
	01-02	*	< LOD	13.9 (11.0-18.4)	27.2 (21.0-33.1)	37.9 (29.9-42.0)	557
	03-04	*	< LOD	12.8 (10.1-15.8)	22.9 (15.8-31.4)	31.4 (22.4-51.6)	462
Non-Hispanic blacks	99-00	*	< LOD	18.7 (<LOD-32.2)	39.9 (26.5-47.3)	48.6 (43.5-65.5)	350
	01-02	11.7 (<LOD-13.6)	< LOD	22.8 (17.2-28.3)	41.4 (30.6-53.7)	56.5 (41.8-73.5)	501
	03-04	8.74 (<LOD-10.2)	8.70 (<LOD-10.6)	18.9 (15.9-21.5)	35.1 (25.4-40.2)	44.2 (37.7-56.8)	493
Non-Hispanic whites	99-00	*	< LOD	21.8 (18.6-24.6)	34.2 (28.9-40.9)	44.0 (37.2-49.8)	559
	01-02	12.1 (11.0-13.3)	11.8 (10.5-13.9)	23.0 (20.1-25.7)	37.5 (31.6-45.1)	52.2 (41.0-67.4)	1031
	03-04	10.2 (9.36-11.1)	11.2 (10.0-12.1)	19.7 (17.2-21.7)	30.3 (26.8-33.6)	37.7 (34.3-45.5)	898

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 14.5, 10.5, and 7.8, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_FactSheet.html

Serum Oxychlordane (lipid adjusted) (2005 – 2010)

Metabolite of Chlordane

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	4.80	1.1	9
		07-08	3.52	0.52	6
		09-10	*	*	10
	20-39	05-06	6.50	1.06	12
		07-08	6.93	0.75	15
		09-10	*	*	17
	40-59	05-06	14.9	1.4	12
		07-08	12.1	0.5	16
		09-10	*	*	17
60+	05-06	25.4	2.5	15	
	07-08	26.1	1.4	23	
	09-10	22.7	1.5	20	
Non-Hispanic White Female	12-19	05-06	2.98	0.3	10
		07-08	3.66	0.74	7
		09-10	*	*	8
	20-39	05-06	5.64	0.56	16
		07-08	5.79	0.51	13
		09-10	*	*	19
	40-59	05-06	13.7	1	13
		07-08	11.8	0.8	17
		09-10	*	*	17
60+	05-06	28.9	2.6	17	
	07-08	31.8	2.3	21	
	09-10	28.1	2	22	
Non-Hispanic Black Male	12-19	05-06	4.08	0.49	13
		07-08	2.80	0.75	6
		09-10	*	*	5
	20-39	05-06	4.53	0.9	6
		07-08	5.72	0.28	6
		09-10	*	*	7
	40-59	05-06	12.0	1	5
		07-08	12.1	1.1	6
		09-10	*	*	6
60+	05-06	32.7	5.3	5	
	07-08	26.6	2.5	8	
	09-10	25.3	3.6	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.46, 1.4, and 14.1, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_FactSheet.html

Serum Oxychlordane (lipid adjusted) (2005 – 2010)

Metabolite of Chlordane

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	2.92	0.31	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	5.56	0.68	7
		07-08	4.45	0.79	8
		09-10	*	*	7
	40-59	05-06	14.5	0.8	7
		07-08	14.3	1	8
		09-10	*	*	6
60+	05-06	52.9	11.7	5	
	07-08	38.1	1.7	7	
	09-10	40.3	3.9	7	
Mexican American Male	12-19	05-06	2.54	0.33	11
		07-08	2.76	0.45	6
		09-10	*	*	7
	20-39	05-06	5.84	1.22	9
		07-08	4.93	0.38	9
		09-10	*	*	8
	40-59	05-06	11.0	1.4	4
		07-08	12.0	0.7	6
		09-10	*	*	8
60+	05-06	18.6	2.4	4	
	07-08	21.9	2.2	5	
	09-10	30.5	4	5	
Mexican American Female	12-19	05-06	2.39	0.25	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	4.39	0.5	9
		07-08	4.17	0.55	8
		09-10	*	*	10
	40-59	05-06	13.7	1.8	6
		07-08	13.4	2.2	6
		09-10	*	*	9
60+	05-06	27.4	3.8	3	
	07-08	28.2	4.3	5	
	09-10	32.0	6.4	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.46, 1.4, and 14.1, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_FactSheet.html

Serum Oxychlordane (lipid adjusted) (2005 – 2010)

Metabolite of Chlordane

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	10
	20-39	09-10	*	*	13
	40-59	09-10	*	*	13
	60+	09-10	26.4	3.2	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	*	*	14
	60+	09-10	28.2	3.9	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.46, 1.4, and 14.1, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_FactSheet.html

Serum Oxychlordane (whole weight) (1999 – 2004)

Metabolite of Chlordane

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	.140 (.120-.150)	.260 (.200-.290)	.310 (.290-.340)	1661
	01-02	.070 (<LOD-.077)	.070 (<LOD-.080)	.140 (.130-.160)	.250 (.220-.300)	.350 (.290-.440)	2249
	03-04	.057 (.053-.062)	.063 (.058-.068)	.119 (.106-.133)	.204 (.189-.213)	.269 (.246-.291)	1978
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	663
	01-02	*	< LOD	< LOD	< LOD	.060 (<LOD-.070)	752
	03-04	*	< LOD	< LOD	.047 (<LOD-.063)	.066 (.048-.092)	595
20 years and older	99-00	*	< LOD	.150 (.140-.180)	.280 (.230-.300)	.330 (.300-.400)	998
	01-02	.082 (.074-.091)	.080 (.070-.090)	.160 (.140-.180)	.270 (.230-.320)	.370 (.310-.450)	1497
	03-04	.067 (.061-.073)	.073 (.066-.079)	.130 (.115-.146)	.210 (.203-.227)	.286 (.258-.320)	1383
Gender Males	99-00	*	< LOD	.120 (.100-.140)	.220 (.180-.280)	.300 (.260-.340)	793
	01-02	.069 (<LOD-.079)	.070 (<LOD-.080)	.130 (.120-.160)	.230 (.190-.300)	.320 (.250-.430)	1049
	03-04	.056 (.050-.063)	.063 (.055-.076)	.115 (.100-.126)	.189 (.168-.207)	.258 (.216-.302)	963
Females	99-00	*	< LOD	.140 (.130-.170)	.270 (.200-.310)	.320 (.290-.400)	868
	01-02	.071 (.065-.077)	.070 (<LOD-.080)	.150 (.130-.160)	.260 (.230-.310)	.370 (.280-.510)	1200
	03-04	.058 (.053-.064)	.063 (.057-.068)	.126 (.104-.146)	.208 (.199-.231)	.286 (.245-.331)	1015
Race/ethnicity Mexican Americans	99-00	*	< LOD	.100 (<LOD-.130)	.210 (.130-.320)	.290 (.190-.410)	628
	01-02	*	< LOD	.100 (.070-.130)	.200 (.150-.240)	.280 (.210-.360)	557
	03-04	*	< LOD	.083 (.066-.104)	.149 (.108-.230)	.230 (.148-.373)	462
Non-Hispanic blacks	99-00	*	< LOD	.110 (<LOD-.170)	.240 (.170-.290)	.320 (.240-.430)	350
	01-02	.066 (<LOD-.077)	< LOD	.130 (.090-.170)	.260 (.180-.350)	.350 (.240-.560)	501
	03-04	.049 (<LOD-.057)	.050 (<LOD-.062)	.112 (.087-.136)	.225 (.165-.287)	.315 (.253-.348)	493
Non-Hispanic whites	99-00	*	< LOD	.140 (.120-.170)	.270 (.200-.300)	.320 (.280-.380)	559
	01-02	.075 (.068-.083)	.080 (.070-.090)	.150 (.130-.170)	.250 (.220-.310)	.370 (.280-.450)	1031
	03-04	.063 (.058-.070)	.070 (.063-.077)	.128 (.110-.148)	.207 (.190-.223)	.271 (.242-.315)	898

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_FactSheet.html

Serum Oxychlordane (whole weight) (2005 – 2010)

Metabolite of Chlordane

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	.026	0.006	9
		07-08	.018	0.003	6
		09-10	*	*	10
	20-39	05-06	.049	0.01	12
		07-08	.047	0.006	15
		09-10	*	*	17
	40-59	05-06	.113	0.013	12
		07-08	.089	0.005	16
		09-10	*	*	17
	60+	05-06	.171	0.015	15
		07-08	.167	0.009	23
		09-10	137	8	20
Non-Hispanic White Female	12-19	05-06	.016	0.002	10
		07-08	.017	0.004	7
		09-10	*	*	8
	20-39	05-06	.037	0.004	16
		07-08	.035	0.003	13
		09-10	*	*	19
	40-59	05-06	.101	0.01	13
		07-08	.079	0.006	17
		09-10	*	*	17
	60+	05-06	.210	0.017	17
		07-08	.214	0.017	21
		09-10	170	12	22
Non-Hispanic Black Male	12-19	05-06	.020	0.002	13
		07-08	.013	0.003	6
		09-10	*	*	5
	20-39	05-06	.027	0.005	6
		07-08	.032	0.002	6
		09-10	*	*	7
	40-59	05-06	.076	0.006	5
		07-08	.077	0.007	6
		09-10	*	*	6
	60+	05-06	.193	0.028	5
		07-08	.162	0.017	8
		09-10	135	19	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_FactSheet.html

Serum Oxychlordane (whole weight) (2005 – 2010)

Metabolite of Chlordane

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.014	0.001	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	.032	0.004	7
		07-08	.022	0.004	8
		09-10	*	*	7
	40-59	05-06	.093	0.006	7
		07-08	.086	0.008	8
		09-10	*	*	6
60+	05-06	.347	0.067	5	
	07-08	.229	0.012	7	
	09-10	.229	17	7	
Mexican American Male	12-19	05-06	.014	0.002	11
		07-08	.014	0.002	6
		09-10	*	*	7
	20-39	05-06	.041	0.007	9
		07-08	.034	0.004	9
		09-10	*	*	8
	40-59	05-06	.089	0.014	4
		07-08	.087	0.009	6
		09-10	*	*	8
60+	05-06	.137	0.025	4	
	07-08	.156	0.011	5	
	09-10	.188	25	5	
Mexican American Female	12-19	05-06	.013	0.001	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	.029	0.003	9
		07-08	.024	0.004	8
		09-10	*	*	10
	40-59	05-06	.100	0.011	6
		07-08	.090	0.014	6
		09-10	*	*	9
60+	05-06	.208	0.035	3	
	07-08	.193	0.03	5	
	09-10	.176	33	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_FactSheet.html

Serum Oxchlordan (whole weight) (2005 – 2010)

Metabolite of Chlordane

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	10
	20-39	09-10	*	*	13
	40-59	09-10	*	*	13
	60+	09-10	166	19	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	*	*	14
	60+	09-10	165	20	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_FactSheet.html

Serum trans-Nonachlor (lipid adjusted) (1999 – 2004)

Metabolite of Chlordane

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	18.3 (16.7-20.0)	17.9 (16.1-20.1)	31.9 (28.9-36.0)	55.1 (48.4-62.6)	79.4 (67.6-88.1)	1933
	01-02	17.0 (15.2-18.9)	17.9 (15.5-20.5)	33.7 (30.2-37.2)	56.3 (49.6-66.0)	78.2 (64.0-113)	2286
	03-04	14.7 (13.1-16.5)	14.8 (13.5-17.0)	30.2 (26.7-32.5)	49.0 (42.6-54.7)	68.3 (58.6-82.3)	1955
Age group 12-19 years	99-00	*	< LOD	< LOD	18.8 (<LOD-20.6)	25.2 (19.1-28.4)	664
	01-02	*	< LOD	< LOD	13.4 (11.8-16.4)	19.2 (15.2-23.5)	758
	03-04	*	< LOD	8.70 (<LOD-12.5)	16.1 (10.7-23.7)	22.6 (16.1-34.6)	589
20 years and older	99-00	20.8 (19.0-22.8)	20.7 (18.0-23.5)	35.4 (30.9-40.3)	59.9 (51.8-67.6)	82.7 (74.9-89.6)	1269
	01-02	19.8 (17.6-22.3)	20.9 (19.0-23.1)	36.6 (32.8-41.1)	60.6 (52.5-69.9)	84.9 (66.0-123)	1528
	03-04	16.9 (15.1-18.9)	17.3 (14.6-20.0)	31.8 (28.9-35.3)	51.4 (45.9-58.6)	74.7 (59.8-90.0)	1366
Gender Males	99-00	17.7 (16.5-19.1)	17.2 (14.9-20.1)	30.2 (27.7-34.2)	51.1 (47.3-58.6)	78.2 (60.2-88.1)	922
	01-02	17.0 (14.8-19.5)	18.3 (14.8-21.1)	34.4 (28.3-39.3)	54.8 (45.0-68.9)	78.2 (59.7-113)	1062
	03-04	14.8 (12.7-17.3)	14.6 (12.2-18.0)	30.8 (26.7-35.3)	51.0 (42.0-59.4)	68.6 (56.0-93.8)	955
Females	99-00	18.8 (16.7-21.1)	18.4 (16.1-22.2)	32.9 (29.0-38.3)	59.0 (48.4-67.6)	80.8 (71.5-95.5)	1011
	01-02	17.0 (15.4-18.7)	17.6 (15.0-20.3)	32.8 (30.4-36.7)	56.9 (51.9-65.5)	78.1 (65.5-111)	1224
	03-04	14.5 (13.1-16.1)	15.0 (13.8-16.3)	28.2 (25.3-32.8)	48.1 (41.4-52.7)	68.3 (56.8-79.9)	1000
Race/ethnicity Mexican Americans	99-00	*	< LOD	25.1 (22.7-29.5)	40.7 (35.1-51.8)	56.3 (45.8-77.2)	650
	01-02	11.9 (<LOD-14.6)	10.6 (<LOD-14.5)	26.0 (19.3-30.4)	47.9 (36.3-57.2)	59.8 (49.3-74.1)	558
	03-04	10.2 (7.86-13.2)	9.10 (<LOD-11.1)	20.7 (11.1-34.7)	39.5 (25.9-65.5)	62.2 (36.0-93.4)	457
Non-Hispanic blacks	99-00	20.3 (17.0-24.1)	17.5 (15.4-23.5)	35.7 (28.9-45.5)	77.0 (60.8-90.7)	107 (84.0-143)	404
	01-02	18.8 (15.4-22.9)	19.2 (14.7-22.0)	36.8 (28.3-50.5)	73.6 (50.8-110)	112 (68.7-160)	514
	03-04	14.4 (12.2-17.0)	13.8 (11.2-16.3)	30.8 (26.5-36.1)	59.9 (47.7-77.7)	86.6 (56.8-129)	486
Non-Hispanic whites	99-00	19.1 (17.2-21.1)	19.0 (16.9-22.2)	32.8 (28.0-37.6)	52.5 (44.9-64.4)	74.0 (62.3-86.7)	722
	01-02	17.5 (15.6-19.7)	19.0 (16.3-21.1)	34.0 (29.7-38.1)	55.5 (45.9-69.4)	78.7 (59.1-126)	1052
	03-04	15.8 (13.7-18.2)	16.0 (13.8-19.3)	30.8 (26.4-35.0)	48.8 (42.1-55.7)	67.6 (57.5-87.3)	889

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 14.5, 10.5, and 7.8, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_FactSheet.html

Serum trans-Nonachlor (lipid adjusted) (2005 – 2010)

Metabolite of Chlordane

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	**9.03	2.84	9
		07-08	6.06	1.08	6
		09-10	6.17	1.26	10
	20-39	05-06	11.3	2	12
		07-08	11.1	1.5	15
		09-10	9.29	0.68	17
	40-59	05-06	26.9	3.9	12
		07-08	21.5	1.2	16
		09-10	17.9	1.3	17
60+	05-06	49.4	7.9	15	
	07-08	50.6	4.2	23	
	09-10	36.4	3.6	21	
Non-Hispanic White Female	12-19	05-06	4.94	0.52	10
		07-08	6.70	0.89	7
		09-10	3.65	0.2	8
	20-39	05-06	9.70	1.44	16
		07-08	8.95	0.97	13
		09-10	6.25	0.5	19
	40-59	05-06	21.8	2.3	13
		07-08	16.4	1.5	17
		09-10	17.7	1.6	17
	60+	05-06	50.2	6.1	17
		07-08	51.7	6.1	21
		09-10	42.9	4.1	22
Non-Hispanic Black Male	12-19	05-06	6.50	0.67	13
		07-08	4.71	0.65	6
		09-10	4.25	0.95	6
	20-39	05-06	8.24	0.86	6
		07-08	8.87	0.97	6
		09-10	7.63	1.89	5
	40-59	05-06	22.0	2.6	5
		07-08	21.7	2.1	6
		09-10	22.5	2.5	7
	60+	05-06	66.4	13.2	5
		07-08	54.4	4.9	8
		09-10	51.4	7.9	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.77, 1.4, and 2.19, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_FactSheet.html

Serum trans-Nonachlor (lipid adjusted) (2005 – 2010)

Metabolite of Chlordane

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	4.44	0.54	14
		07-08	**3.39	1.18	5
		09-10	3.27	0.38	6
	20-39	05-06	9.32	1.22	7
		07-08	6.42	0.6	8
		09-10	6.82	0.5	7
	40-59	05-06	24.1	1.5	7
		07-08	20.4	1.7	8
		09-10	21.7	3.1	7
60+	05-06	89.0	15.4	5	
	07-08	68.0	3.9	7	
	09-10	64.2	5.5	7	
Mexican American Male	12-19	05-06	3.71	0.49	11
		07-08	3.91	0.81	6
		09-10	3.71	0.37	8
	20-39	05-06	7.58	0.75	9
		07-08	8.43	0.97	9
		09-10	6.37	1.07	8
	40-59	05-06	18.8	2.4	4
		07-08	24.5	2.9	6
		09-10	18.8	1.6	8
60+	05-06	30.7	6.3	4	
	07-08	40.3	4.5	5	
	09-10	62.9	11.8	5	
Mexican American Female	12-19	05-06	3.53	0.23	16
		07-08	*	*	5
		09-10	2.76	0.33	7
	20-39	05-06	6.40	0.75	9
		07-08	7.55	0.9	8
		09-10	6.06	0.72	10
	40-59	05-06	18.5	1.7	6
		07-08	22.6	4.4	6
		09-10	20.1	2.2	9
60+	05-06	46.4	9.8	3	
	07-08	46.9	8	5	
	09-10	58.3	10.9	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.77, 1.4, and 2.19, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_FactSheet.html

Serum trans-Nonachlor (lipid adjusted) (2005 – 2010)

Metabolite of Chlordane

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	3.48	0.3	11
	20-39	09-10	7.49	1.04	13
	40-59	09-10	17.2	1.3	13
	60+	09-10	52.2	9	8
All Hispanic Female	12-19	09-10	2.84	0.26	10
	20-39	09-10	6.08	0.64	14
	40-59	09-10	17.6	1.9	14
	60+	09-10	51.3	7.2	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.77, 1.4, and 2.19, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_FactSheet.html

Serum trans-Nonachlor (whole weight) (1999 – 2004)

Metabolite of Chlordane

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	.109 (.099-.119)	.110 (.090-.120)	.210 (.190-.240)	.370 (.330-.420)	.550 (.470-.630)	1933
	01-02	.104 (.093-.116)	.110 (.100-.120)	.220 (.190-.250)	.390 (.330-.480)	.590 (.430-.800)	2286
	03-04	.089 (.080-.100)	.094 (.084-.108)	.191 (.171-.211)	.324 (.290-.371)	.470 (.410-.558)	1955
Age group 12-19 years	99-00	*	< LOD	< LOD	.090 (<LOD-.110)	.120 (.100-.130)	664
	01-02	*	< LOD	< LOD	.070 (.060-.080)	.090 (.080-.130)	758
	03-04	*	< LOD	.041 (<LOD-.060)	.081 (.054-.117)	.109 (.081-.161)	589
20 years and older	99-00	.128 (.116-.141)	.130 (.110-.150)	.230 (.210-.260)	.400 (.360-.460)	.580 (.490-.690)	1269
	01-02	.125 (.111-.141)	.130 (.120-.150)	.240 (.210-.280)	.420 (.350-.540)	.640 (.470-.840)	1528
	03-04	.106 (.095-.119)	.112 (.096-.127)	.210 (.186-.237)	.355 (.301-.405)	.520 (.430-.594)	1366
Gender Males	99-00	.106 (.098-.114)	.100 (.090-.120)	.210 (.180-.220)	.350 (.310-.400)	.520 (.400-.630)	922
	01-02	.105 (.091-.122)	.110 (.090-.130)	.220 (.190-.260)	.380 (.310-.500)	.580 (.390-.830)	1062
	03-04	.092 (.079-.108)	.098 (.085-.126)	.202 (.177-.232)	.343 (.285-.395)	.458 (.395-.594)	955
Females	99-00	.111 (.099-.125)	.110 (.090-.130)	.220 (.190-.250)	.390 (.310-.460)	.580 (.460-.690)	1011
	01-02	.103 (.093-.113)	.110 (.090-.120)	.220 (.180-.240)	.400 (.340-.450)	.590 (.430-.830)	1224
	03-04	.087 (.078-.097)	.092 (.079-.098)	.183 (.161-.210)	.317 (.286-.367)	.470 (.409-.565)	1000
Race/ethnicity Mexican Americans	99-00	*	< LOD	.170 (.120-.210)	.310 (.240-.340)	.390 (.320-.520)	650
	01-02	.071 (<LOD-.091)	.060 (<LOD-.090)	.160 (.120-.210)	.330 (.270-.390)	.470 (.360-.590)	558
	03-04	.062 (.047-.082)	.055 (<LOD-.069)	.135 (.069-.237)	.288 (.158-.559)	.414 (.279-.651)	457
Non-Hispanic blacks	99-00	.112 (.093-.134)	.100 (.080-.130)	.220 (.180-.300)	.490 (.340-.600)	.760 (.510-.960)	404
	01-02	.106 (.085-.131)	.110 (.080-.130)	.220 (.160-.310)	.490 (.320-.680)	.680 (.410-1.20)	514
	03-04	.080 (.068-.096)	.078 (.061-.093)	.186 (.145-.242)	.417 (.272-.565)	.573 (.497-.684)	486
Non-Hispanic whites	99-00	.116 (.104-.129)	.120 (.100-.140)	.220 (.190-.240)	.370 (.300-.440)	.510 (.440-.630)	722
	01-02	.108 (.096-.122)	.120 (.100-.130)	.220 (.190-.250)	.390 (.310-.490)	.600 (.400-.930)	1052
	03-04	.098 (.085-.113)	.103 (.090-.124)	.205 (.173-.234)	.327 (.288-.390)	.461 (.397-.576)	889

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_FactSheet.html

Serum trans-Nonachlor (whole weight) (2005 – 2010)

Metabolite of Chlordane

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	** .048	0.015	9
		07-08	.030	0.005	6
		09-10	33.2	6.8	10
	20-39	05-06	.086	0.019	12
		07-08	.076	0.011	15
		09-10	61.2	5.1	17
	40-59	05-06	.206	0.034	12
		07-08	.159	0.012	16
		09-10	122	10	17
60+	05-06	.331	0.049	15	
	07-08	.325	0.028	23	
	09-10	221	21	21	
Non-Hispanic White Female	12-19	05-06	.026	0.003	10
		07-08	.031	0.004	7
		09-10	17.4	1.1	8
	20-39	05-06	.063	0.01	16
		07-08	.054	0.007	13
		09-10	33.9	3.3	19
	40-59	05-06	.161	0.019	13
		07-08	.108	0.009	17
		09-10	111	10	17
60+	05-06	.362	0.04	17	
	07-08	.352	0.045	21	
	09-10	259	24	22	
Non-Hispanic Black Male	12-19	05-06	.032	0.003	13
		07-08	.022	0.003	6
		09-10	19.8	5.1	6
	20-39	05-06	.049	0.006	6
		07-08	.050	0.006	6
		09-10	39.2	9.3	5
	40-59	05-06	.140	0.014	5
		07-08	.138	0.013	6
		09-10	139	15	7
60+	05-06	.390	0.071	5	
	07-08	.331	0.032	8	
	09-10	275	43	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_FactSheet.html

Serum trans-Nonachlor (whole weight) (2005 – 2010)

Metabolite of Chlordane

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.022	0.003	14
		07-08	** .016	0.005	5
		09-10	14.4	1.6	6
	20-39	05-06	.054	0.007	7
		07-08	.032	0.003	8
		09-10	33.7	2.9	7
	40-59	05-06	.154	0.009	7
		07-08	.124	0.012	8
		09-10	121	15	7
60+	05-06	.588	0.088	5	
	07-08	.409	0.027	7	
	09-10	365	25	7	
Mexican American Male	12-19	05-06	.020	0.002	11
		07-08	.020	0.004	6
		09-10	17.5	1.9	8
	20-39	05-06	.054	0.005	9
		07-08	.058	0.008	9
		09-10	39.7	7.7	8
	40-59	05-06	.153	0.022	4
		07-08	.176	0.024	6
		09-10	129	12	8
60+	05-06	.228	0.06	4	
	07-08	.289	0.028	5	
	09-10	387	73	5	
Mexican American Female	12-19	05-06	.019	0.001	16
		07-08	*	*	5
		09-10	12.9	1.6	7
	20-39	05-06	.042	0.005	9
		07-08	.044	0.006	8
		09-10	33.3	4	10
	40-59	05-06	.135	0.011	6
		07-08	.151	0.029	6
		09-10	128	13	9
60+	05-06	.360	0.095	3	
	07-08	.323	0.058	5	
	09-10	321	56	6	

† See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_FactSheet.html

Serum trans-Nonachlor (whole weight) (2005 – 2010)

Metabolite of Chlordane

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	16.3	1.6	11
	20-39	09-10	48.9	7.9	13
	40-59	09-10	117	10	13
	60+	09-10	327	54	8
All Hispanic Female	12-19	09-10	13.2	1.2	10
	20-39	09-10	33.8	3.7	14
	40-59	09-10	110	12	14
	60+	09-10	299	38	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/ChlordaneHeptachlor_FactSheet.html

Serum p,p'-Dichlorodiphenyltrichloroethane (DDT) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	28.0 (21.9-34.0)	1679
	01-02	*	< LOD	< LOD	< LOD	26.6 (22.5-36.0)	2305
	03-04	*	< LOD	< LOD	11.9 (10.0-15.1)	19.5 (15.1-27.5)	1965
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	677
	01-02	*	< LOD	< LOD	< LOD	< LOD	756
	03-04	*	< LOD	< LOD	< LOD	9.10 (<LOD-12.2)	595
20 years and older	99-00	*	< LOD	< LOD	< LOD	30.5 (23.0-37.3)	1002
	01-02	*	< LOD	< LOD	< LOD	28.1 (23.8-39.0)	1549
	03-04	*	< LOD	< LOD	12.9 (10.3-16.5)	20.7 (15.9-28.7)	1370
Gender Males	99-00	*	< LOD	< LOD	< LOD	25.1 (<LOD-39.3)	799
	01-02	*	< LOD	< LOD	< LOD	21.6 (<LOD-25.8)	1073
	03-04	*	< LOD	< LOD	10.6 (9.10-13.7)	15.2 (11.8-26.9)	959
Females	99-00	*	< LOD	< LOD	< LOD	29.4 (23.0-35.8)	880
	01-02	*	< LOD	< LOD	18.3 (<LOD-21.9)	36.6 (25.5-54.3)	1232
	03-04	*	< LOD	< LOD	14.0 (10.8-17.5)	21.0 (18.0-27.8)	1006
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	61.3 (27.0-155)	155 (59.3-590)	635
	01-02	*	< LOD	< LOD	83.1 (33.3-236)	293 (104-541)	566
	03-04	*	< LOD	8.90 (<LOD-12.9)	24.0 (18.6-33.3)	48.6 (31.1-71.1)	461
Non-Hispanic blacks	99-00	*	< LOD	< LOD	22.3 (<LOD-31.5)	31.5 (23.2-65.0)	356
	01-02	*	< LOD	< LOD	23.2 (<LOD-40.9)	40.9 (21.2-95.8)	514
	03-04	*	< LOD	9.00 (<LOD-10.4)	17.5 (14.8-23.2)	30.7 (19.0-53.4)	490
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	564
	01-02	*	< LOD	< LOD	< LOD	17.9 (<LOD-20.7)	1061
	03-04	*	< LOD	< LOD	9.70 (8.50-11.2)	12.9 (10.7-16.6)	890

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 20.7, 17.4, and 7.8, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DDT_BiomonitoringSummary.html

Serum p,p'-DDT (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	2.23	0.15	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	**10.7	8.4	12
		07-08	2.05	0.37	15
		09-10	2.51	0.31	17
	40-59	05-06	3.79	0.26	12
		07-08	2.81	0.25	16
		09-10	2.56	0.17	17
60+	05-06	5.68	0.54	15	
	07-08	4.85	0.47	23	
	09-10	3.91	0.41	21	
Non-Hispanic White Female	12-19	05-06	2.27	0.45	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	2.72	0.22	16
		07-08	*	*	13
		09-10	2.72	0.32	19
	40-59	05-06	3.81	0.41	13
		07-08	2.90	0.23	17
		09-10	2.86	0.3	17
60+	05-06	6.21	0.41	17	
	07-08	6.37	0.91	21	
	09-10	4.86	0.51	22	
Non-Hispanic Black Male	12-19	05-06	**4.98	1.85	13
		07-08	*	*	6
		09-10	*	*	6
	20-39	05-06	**7.55	3.07	6
		07-08	1.80	0.37	6
		09-10	*	*	7
	40-59	05-06	**7.42	3.13	5
		07-08	4.68	0.69	6
		09-10	4.41	0.7	7
60+	05-06	14.9	3.2	5	
	07-08	6.57	0.83	8	
	09-10	6.49	0.78	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.46, 1.4, and 2.19, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DDT_BiomonitoringSummary.html

Serum p,p'-DDT (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	2.59	0.34	14
		07-08	*	*	5
		09-10	**26.1	27.1	6
	20-39	05-06	**14.5	10.8	7
		07-08	*	*	8
		09-10	2.98	0.56	7
	40-59	05-06	7.36	1.11	7
		07-08	5.86	0.51	8
		09-10	**21.4	9.6	7
	60+	05-06	**32.5	11.5	5
07-08		19.3	3	7	
09-10		**14.8	5.1	7	
Mexican American Male	12-19	05-06	**118	67	11
		07-08	*	*	6
		09-10	**4.94	2.18	8
	20-39	05-06	**46.9	16	9
		07-08	18.6	4.2	9
		09-10	**12.2	9.8	8
	40-59	05-06	**107	62	4
		07-08	**14.7	7.1	6
		09-10	**9.00	3.29	8
	60+	05-06	7.14	1.69	4
07-08		**17.5	16.1	5	
09-10		6.36	1.16	5	
Mexican American Female	12-19	05-06	**21.5	12.2	16
		07-08	*	*	5
		09-10	**9.22	3.57	7
	20-39	05-06	**47.9	27.9	9
		07-08	**40.4	28	8
		09-10	**23.5	12	10
	40-59	05-06	**33.7	15.9	6
		07-08	11.8	3.1	6
		09-10	**113	64	9
	60+	05-06	17.3	4.8	3
07-08		**119	151	5	
09-10		**56.9	32.4	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.46, 1.4, and 2.19, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DDT_BiomonitoringSummary.html

Serum p,p'-DDT (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	**4.10	1.63	11
	20-39	09-10	**9.70	5.98	13
	40-59	09-10	7.35	2.08	13
	60+	09-10	7.75	1.43	8
All Hispanic Female	12-19	09-10	**7.08	2.74	10
	20-39	09-10	**17.5	8.6	14
	40-59	09-10	**75.2	42.3	14
	60+	09-10	**37.0	18.7	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.46, 1.4, and 2.19, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DDT_BiomonitoringSummary.html

Serum p,p'-Dichlorodiphenyltrichloroethane (DDT) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	.170 (.130-.220)	1679
	01-02	*	< LOD	< LOD	< LOD	.180 (.160-.220)	2305
	03-04	*	< LOD	< LOD	.078 (.065-.097)	.128 (.098-.167)	1965
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	677
	01-02	*	< LOD	< LOD	< LOD	< LOD	756
	03-04	*	< LOD	< LOD	< LOD	.048 (<LOD-.069)	595
20 years and older	99-00	*	< LOD	< LOD	< LOD	.190 (.150-.230)	1002
	01-02	*	< LOD	< LOD	< LOD	.200 (.170-.260)	1549
	03-04	*	< LOD	< LOD	.084 (.068-.106)	.142 (.105-.189)	1370
Gender Males	99-00	*	< LOD	< LOD	< LOD	.150 (<LOD-.240)	799
	01-02	*	< LOD	< LOD	< LOD	.150 (<LOD-.180)	1073
	03-04	*	< LOD	< LOD	.071 (.059-.095)	.108 (.078-.180)	959
Females	99-00	*	< LOD	< LOD	< LOD	.190 (.150-.230)	880
	01-02	*	< LOD	< LOD	.130 (<LOD-.150)	.240 (.180-.400)	1232
	03-04	*	< LOD	< LOD	.087 (.071-.106)	.146 (.106-.207)	1006
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	.400 (.190-1.00)	1.00 (.330-4.26)	635
	01-02	*	< LOD	< LOD	.530 (.250-1.34)	1.62 (.570-4.01)	566
	03-04	*	< LOD	.063 (<LOD-.079)	.146 (.114-.203)	.313 (.189-.627)	461
Non-Hispanic blacks	99-00	*	< LOD	< LOD	.120 (<LOD-.170)	.180 (.140-.420)	356
	01-02	*	< LOD	< LOD	.130 (<LOD-.290)	.250 (.120-.530)	514
	03-04	*	< LOD	.051 (<LOD-.061)	.112 (.080-.143)	.201 (.132-.343)	490
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	564
	01-02	*	< LOD	< LOD	< LOD	.130 (<LOD-.140)	1061
	03-04	*	< LOD	< LOD	.064 (.054-.075)	.086 (.074-.107)	890

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DDT_BiomonitoringSummary.html

Serum p,p'-DDT (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	.012	0.001	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	**088	0.072	12
		07-08	.014	0.003	15
		09-10	16.4	2.1	17
	40-59	05-06	.028	0.002	12
		07-08	.021	0.002	16
		09-10	17.4	1.2	17
60+	05-06	.038	0.003	15	
	07-08	.031	0.003	23	
	09-10	23.6	2.3	21	
Non-Hispanic White Female	12-19	05-06	.012	0.002	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	.018	0.002	16
		07-08	*	*	13
		09-10	14.3	1.6	19
	40-59	05-06	.028	0.003	13
		07-08	.019	0.002	17
		09-10	17.9	1.8	17
	60+	05-06	.045	0.003	17
		07-08	.043	0.006	21
		09-10	29.0	2.6	22
Non-Hispanic Black Male	12-19	05-06	**025	0.01	13
		07-08	*	*	6
		09-10	*	*	6
	20-39	05-06	**047	0.02	6
		07-08	.010	0.002	6
		09-10	*	*	7
	40-59	05-06	**048	0.021	5
		07-08	.030	0.004	6
		09-10	27.5	4.7	7
	60+	05-06	.088	0.019	5
		07-08	.040	0.005	8
		09-10	34.2	3.4	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DDT_BiomonitoringSummary.html

Serum p,p'-DDT (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.013	0.002	14
		07-08	*	*	5
		09-10	**113	117	6
	20-39	05-06	**085	0.064	7
		07-08	*	*	8
		09-10	14.8	3	7
	40-59	05-06	.047	0.007	7
		07-08	.035	0.003	8
		09-10	**119	54	7
	60+	05-06	**216	0.078	5
07-08		.115	0.017	7	
09-10		**86.1	30.7	7	
Mexican American Male	12-19	05-06	**632	0.352	11
		07-08	*	*	6
		09-10	**23.6	10.4	8
	20-39	05-06	**349	0.127	9
		07-08	.129	0.029	9
		09-10	**70.4	53.8	8
	40-59	05-06	**864	0.515	4
		07-08	**108	0.052	6
		09-10	**59.9	21.4	8
	60+	05-06	.053	0.015	4
07-08		**131	0.121	5	
09-10		40.0	9	5	
Mexican American Female	12-19	05-06	**117	0.068	16
		07-08	*	*	5
		09-10	**42.9	16.4	7
	20-39	05-06	**293	0.163	9
		07-08	**233	0.159	8
		09-10	**136	73	10
	40-59	05-06	**239	0.107	6
		07-08	.081	0.022	6
		09-10	**796	486	9
	60+	05-06	**138	0.05	3
07-08		**820	1.049	5	
09-10		**338	208	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DDT_BiomonitoringSummary.html

Serum p,p'-DDT (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	**19.4	7.8	11
	20-39	09-10	**58.1	33	13
	40-59	09-10	48.8	13.5	13
	60+	09-10	50.2	10	8
All Hispanic Female	12-19	09-10	**32.9	12.6	10
	20-39	09-10	**101	52	14
	40-59	09-10	**525	320	14
	60+	09-10	**223	118	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DDT_BiomonitoringSummary.html

Serum p,p'-Dichlorodiphenyldichloroethene (DDE) (lipid adjusted) (1999 – 2004)

Metabolite of Dichlorodiphenyltrichloroethane

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	260 (226-298)	226 (184-278)	537 (476-631)	1150 (976-1350)	1830 (1410-2300)	1964
	01-02	295 (267-327)	251 (228-278)	598 (521-699)	1410 (1210-1500)	2320 (1830-2780)	2298
	03-04	238 (195-292)	203 (163-275)	509 (376-655)	1170 (836-1570)	1860 (1400-2380)	1956
Age group 12-19 years	99-00	118 (102-135)	108 (97.7-119)	185 (141-237)	339 (243-479)	528 (339-812)	686
	01-02	124 (106-146)	113 (100-140)	213 (172-253)	319 (282-389)	456 (343-722)	758
	03-04	105 (84.7-129)	93.6 (81.0-114)	167 (123-240)	341 (211-586)	522 (313-1430)	588
20 years and older	99-00	297 (256-344)	269 (213-323)	608 (530-693)	1260 (1030-1550)	2020 (1520-2730)	1278
	01-02	338 (303-376)	285 (249-337)	695 (595-798)	1480 (1310-1700)	2550 (1980-3080)	1540
	03-04	268 (217-332)	233 (175-314)	557 (420-734)	1270 (877-1800)	1990 (1500-2470)	1368
Gender Males	99-00	249 (220-283)	223 (182-262)	494 (380-578)	1010 (789-1130)	1430 (1080-2160)	937
	01-02	285 (252-323)	248 (222-285)	520 (441-627)	1160 (937-1360)	1900 (1580-2490)	1069
	03-04	235 (193-288)	200 (164-262)	466 (331-653)	1000 (763-1400)	1610 (1210-2320)	955
Females	99-00	270 (226-322)	234 (184-302)	601 (492-711)	1350 (1040-1720)	2210 (1570-2810)	1027
	01-02	305 (273-341)	256 (219-297)	708 (567-844)	1480 (1410-1710)	2670 (1940-3300)	1229
	03-04	241 (193-301)	207 (161-281)	539 (386-735)	1250 (813-1900)	2010 (1500-2450)	1001
Race/ethnicity Mexican Americans	99-00	674 (574-792)	624 (545-701)	1350 (1090-1660)	3090 (2040-4950)	4950 (3070-9350)	657
	01-02	652 (569-747)	561 (455-690)	1400 (1050-1950)	4110 (2520-6550)	7080 (3080-15600)	566
	03-04	444 (362-545)	373 (283-522)	875 (608-1170)	2150 (1520-2470)	3290 (2380-9240)	457
Non-Hispanic blacks	99-00	295 (241-362)	251 (199-313)	668 (492-874)	1850 (1040-2220)	2300 (1560-5680)	416
	01-02	324 (262-400)	248 (223-296)	762 (583-999)	1620 (1180-2980)	3260 (1270-6900)	515
	03-04	262 (233-295)	216 (173-267)	589 (453-747)	1620 (1130-2310)	2860 (1880-3440)	487
Non-Hispanic whites	99-00	217 (189-249)	194 (162-238)	438 (355-507)	825 (647-1010)	1160 (1010-1350)	732
	01-02	253 (226-284)	225 (203-254)	463 (402-558)	1150 (878-1340)	1640 (1410-1940)	1053
	03-04	208 (165-263)	177 (148-238)	417 (302-564)	907 (574-1480)	1490 (909-2300)	888

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 18.6, 8.3, and 7.8, respectively. < LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DDT_BiomonitoringSummary.html

Serum p,p'-DDE (lipid adjusted) (2005 – 2010)

Metabolite of Dichlorodiphenyltrichloroethane

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	113	20	9
		07-08	86.7	7.7	6
		09-10	85.4	17.7	10
	20-39	05-06	**399	280	12
		07-08	113	11	15
		09-10	102	7	17
	40-59	05-06	220	19	12
		07-08	176	14	16
		09-10	153	17	17
60+	05-06	696	53	15	
	07-08	502	46	23	
	09-10	368	26	21	
Non-Hispanic White Female	12-19	05-06	83.6	6.7	10
		07-08	70.2	14.9	7
		09-10	51.6	5.5	8
	20-39	05-06	102	7	16
		07-08	91.8	6.3	13
		09-10	86.3	6.3	19
	40-59	05-06	276	36	13
		07-08	179	12	17
		09-10	256	65	17
60+	05-06	736	71	17	
	07-08	521	46	21	
	09-10	538	47	22	
Non-Hispanic Black Male	12-19	05-06	141	21	13
		07-08	91.5	8.5	6
		09-10	98.4	16.2	6
	20-39	05-06	236	59	6
		07-08	123	12	6
		09-10	**263	105	7
	40-59	05-06	454	70	5
		07-08	333	20	6
		09-10	325	48	7
60+	05-06	1910	448	5	
	07-08	854	88	8	
	09-10	1030	230	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 4.02, 1.4, and 3.68, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DDT_BiomonitoringSummary.html

Serum p,p'-DDE (lipid adjusted) (2005 – 2010)

Metabolite of Dichlorodiphenyltrichloroethane

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	81.8	4.8	14
		07-08	63.6	8.4	5
		09-10	**287	242	6
	20-39	05-06	**237	87	7
		07-08	105	10	8
		09-10	110	15	7
	40-59	05-06	691	130	7
		07-08	495	82	8
		09-10	736	202	7
	60+	05-06	2110	398	5
		07-08	2390	354	7
		09-10	1510	348	6
Mexican American Male	12-19	05-06	**2450	1272	11
		07-08	265	39	6
		09-10	254	51	8
	20-39	05-06	1730	472	9
		07-08	1090	233	9
		09-10	583	143	8
	40-59	05-06	**2160	845	4
		07-08	1010	149	6
		09-10	803	108	8
	60+	05-06	**1180	394	4
		07-08	1160	223	5
		09-10	1130	155	5
Mexican American Female	12-19	05-06	464	118	16
		07-08	164	34	5
		09-10	489	127	7
	20-39	05-06	895	239	9
		07-08	**653	301	8
		09-10	**694	228	9
	40-59	05-06	1320	121	6
		07-08	1080	133	6
		09-10	2550	762	9
	60+	05-06	1550	153	3
		07-08	**2960	1477	5
		09-10	2590	528	6

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 4.02, 1.4, and 3.68, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DDT_BiomonitoringSummary.html

Serum p,p'-DDE (lipid adjusted) (2005 – 2010)

Metabolite of Dichlorodiphenyltrichloroethane

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	233	39	11
	20-39	09-10	571	115	13
	40-59	09-10	798	75	13
	60+	09-10	1040	106	8
All Hispanic Female	12-19	09-10	384	105	10
	20-39	09-10	563	162	13
	40-59	09-10	1940	529	14
	60+	09-10	2040	363	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 4.02, 1.4, and 3.68, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DDT_BiomonitoringSummary.html

Serum p,p'-Dichlorodiphenyldichloroethene (DDE) (whole weight) (1999 – 2004)

Metabolite of Dichlorodiphenyltrichloroethane

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	1.54 (1.33-1.79)	1.31 (1.09-1.66)	3.50 (2.97-4.27)	7.49 (6.14-9.25)	11.6 (9.25-14.8)	1964
	01-02	1.81 (1.64-2.01)	1.57 (1.37-1.72)	3.97 (3.43-4.59)	8.81 (7.85-10.1)	15.4 (12.9-17.6)	2298
	03-04	1.45 (1.18-1.79)	1.26 (1.00-1.58)	3.16 (2.40-4.21)	7.07 (5.55-9.80)	12.1 (8.37-16.0)	1956
Age group 12-19 years	99-00	.561 (.488-.646)	.520 (.430-.600)	.870 (.680-1.18)	1.52 (1.13-2.25)	2.32 (1.76-3.56)	686
	01-02	.623 (.534-.726)	.590 (.500-.730)	1.00 (.820-1.22)	1.65 (1.39-2.07)	2.30 (1.91-3.14)	758
	03-04	.516 (.419-.635)	.456 (.385-.557)	.796 (.611-1.19)	1.69 (.994-2.69)	2.51 (1.56-6.71)	588
20 years and older	99-00	1.83 (1.56-2.14)	1.61 (1.26-2.07)	4.17 (3.48-4.66)	8.12 (6.37-10.6)	12.3 (9.87-16.7)	1278
	01-02	2.14 (1.91-2.39)	1.77 (1.61-2.05)	4.59 (4.10-5.26)	9.75 (8.34-11.5)	16.8 (13.7-19.1)	1540
	03-04	1.69 (1.36-2.10)	1.46 (1.12-1.96)	3.68 (2.66-4.96)	7.91 (6.01-11.0)	12.8 (9.25-16.8)	1368
Gender Males	99-00	1.49 (1.30-1.70)	1.25 (1.10-1.44)	3.02 (2.57-3.80)	6.43 (5.40-8.00)	9.63 (6.63-15.6)	937
	01-02	1.77 (1.57-2.01)	1.59 (1.36-1.76)	3.40 (3.03-4.10)	7.48 (6.43-8.75)	13.1 (9.66-17.6)	1069
	03-04	1.46 (1.18-1.80)	1.30 (1.04-1.58)	2.80 (2.18-4.13)	6.71 (5.51-8.54)	9.93 (7.51-15.4)	955
Females	99-00	1.59 (1.32-1.92)	1.38 (1.03-1.99)	4.05 (3.15-4.79)	8.18 (6.36-11.5)	13.2 (9.81-18.5)	1027
	01-02	1.85 (1.66-2.06)	1.49 (1.32-1.75)	4.57 (3.81-5.47)	10.2 (9.01-11.9)	16.8 (13.4-19.7)	1229
	03-04	1.45 (1.16-1.82)	1.25 (.965-1.66)	3.55 (2.43-4.59)	7.87 (5.41-12.6)	13.7 (8.50-17.3)	1001
Race/ethnicity Mexican Americans	99-00	3.92 (3.40-4.51)	3.52 (3.17-3.91)	8.22 (7.26-10.4)	22.0 (12.2-32.2)	32.2 (19.7-48.1)	657
	01-02	3.92 (3.37-4.57)	3.53 (2.68-4.34)	9.34 (7.31-12.5)	26.6 (17.9-38.3)	40.9 (26.8-90.5)	566
	03-04	2.69 (2.18-3.32)	2.24 (1.70-3.24)	5.78 (4.54-7.21)	13.0 (9.53-15.6)	22.9 (15.3-43.4)	457
Non-Hispanic blacks	99-00	1.63 (1.31-2.02)	1.37 (1.11-1.66)	3.84 (3.01-5.69)	11.2 (6.57-13.3)	14.6 (8.88-35.2)	416
	01-02	1.82 (1.46-2.28)	1.38 (1.22-1.72)	4.39 (3.52-6.06)	10.6 (7.24-17.6)	19.4 (8.51-49.3)	515
	03-04	1.47 (1.30-1.65)	1.20 (.963-1.51)	3.76 (2.85-4.75)	9.23 (7.19-14.9)	16.8 (14.7-20.6)	487
Non-Hispanic whites	99-00	1.32 (1.14-1.53)	1.13 (1.01-1.35)	2.88 (2.34-3.36)	5.75 (4.62-6.53)	8.04 (6.32-9.81)	732
	01-02	1.57 (1.39-1.76)	1.41 (1.27-1.58)	3.11 (2.56-3.68)	7.00 (6.02-8.34)	11.3 (8.60-13.7)	1053
	03-04	1.29 (1.01-1.64)	1.12 (.890-1.49)	2.63 (1.84-3.90)	6.36 (3.90-8.71)	9.71 (6.01-15.0)	888

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DDT_BiomonitoringSummary.html

Serum p,p'-DDE (whole weight) (2005 – 2010)

Metabolite of Dichlorodiphenyltrichloroethane

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	.592	0.071	9
		07-08	.429	0.031	6
		09-10	454	89	10
	20-39	05-06	**3.23	2.4	12
		07-08	.745	0.073	15
		09-10	670	53	17
	40-59	05-06	1.64	0.13	12
		07-08	1.27	0.09	16
		09-10	1050	121	17
	60+	05-06	4.72	0.32	15
		07-08	3.21	0.29	23
		09-10	2210	138	21
Non-Hispanic White Female	12-19	05-06	.444	0.034	10
		07-08	.334	0.079	7
		09-10	247	29	8
	20-39	05-06	.657	0.046	16
		07-08	.546	0.037	13
		09-10	457	33	19
	40-59	05-06	2.02	0.27	13
		07-08	1.18	0.08	17
		09-10	1590	392	17
	60+	05-06	5.38	0.51	17
		07-08	3.50	0.31	21
		09-10	3210	245	22
Non-Hispanic Black Male	12-19	05-06	.705	0.099	13
		07-08	.434	0.044	6
		09-10	436	53	6
	20-39	05-06	1.43	0.39	6
		07-08	.694	0.076	6
		09-10	**1640	747	7
	40-59	05-06	2.86	0.39	5
		07-08	2.14	0.15	6
		09-10	2030	341	7
	60+	05-06	11.4	2.7	5
		07-08	5.21	0.59	8
		09-10	5360	1126	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DDT_BiomonitoringSummary.html

Serum p,p'-DDE (whole weight) (2005 – 2010)

Metabolite of Dichlorodiphenyltrichloroethane

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.406	0.025	14
		07-08	.300	0.037	5
		09-10	**1250	1044	6
	20-39	05-06	**1.38	0.52	7
		07-08	.524	0.05	8
		09-10	548	84	7
	40-59	05-06	4.51	0.94	7
		07-08	2.97	0.49	8
		09-10	4110	1118	7
60+	05-06	14.0	2.5	5	
	07-08	14.4	2.2	7	
	09-10	8880	2175	6	
Mexican American Male	12-19	05-06	**13.0	6.7	11
		07-08	1.39	0.18	6
		09-10	1200	245	8
	20-39	05-06	12.8	3.7	9
		07-08	7.50	1.68	9
		09-10	3540	831	8
	40-59	05-06	**17.0	6	4
		07-08	7.34	1.34	6
		09-10	5420	693	8
60+	05-06	**8.69	3.03	4	
	07-08	8.68	2.08	5	
	09-10	6960	973	5	
Mexican American Female	12-19	05-06	2.52	0.65	16
		07-08	.803	0.172	5
		09-10	2280	579	7
	20-39	05-06	5.94	1.49	9
		07-08	**3.80	1.71	8
		09-10	**3860	1315	9
	40-59	05-06	9.64	0.85	6
		07-08	7.28	0.97	6
		09-10	**17100	5622	9
60+	05-06	12.1	2.3	3	
	07-08	**20.4	10.2	5	
	09-10	14700	3537	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DDT_BiomonitoringSummary.html

Serum p,p'-DDE (whole weight) (2005 – 2010)

Metabolite of Dichlorodiphenyltrichloroethane

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	1090	186	11
	20-39	09-10	3840	927	13
	40-59	09-10	5420	529	13
	60+	09-10	6510	646	8
All Hispanic Female	12-19	09-10	1790	484	10
	20-39	09-10	3140	932	13
	40-59	09-10	**12800	3871	14
	60+	09-10	12100	2250	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DDT_BiomonitoringSummary.html

Serum o,p'-Dichlorodiphenyltrichloroethane (DDT) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1669
	01-02	*	< LOD	< LOD	< LOD	< LOD	2279
	03-04	*	< LOD	< LOD	< LOD	< LOD	1946
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	667
	01-02	*	< LOD	< LOD	< LOD	< LOD	756
	03-04	*	< LOD	< LOD	< LOD	< LOD	588
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1002
	01-02	*	< LOD	< LOD	< LOD	< LOD	1523
	03-04	*	< LOD	< LOD	< LOD	< LOD	1358
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	796
	01-02	*	< LOD	< LOD	< LOD	< LOD	1059
	03-04	*	< LOD	< LOD	< LOD	< LOD	949
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	873
	01-02	*	< LOD	< LOD	< LOD	< LOD	1220
	03-04	*	< LOD	< LOD	< LOD	< LOD	997
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	632
	01-02	*	< LOD	< LOD	< LOD	< LOD	565
	03-04	*	< LOD	< LOD	< LOD	< LOD	458
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	354
	01-02	*	< LOD	< LOD	< LOD	< LOD	507
	03-04	*	< LOD	< LOD	< LOD	< LOD	486
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	560
	01-02	*	< LOD	< LOD	< LOD	< LOD	1045
	03-04	*	< LOD	< LOD	< LOD	< LOD	880

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 20.7, 17.4, and 7.8, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Serum o,p'-Dichlorodiphenyltrichloroethane (DDT) (whole weight)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1669
	01-02	*	< LOD	< LOD	< LOD	< LOD	2279
	03-04	*	< LOD	< LOD	< LOD	< LOD	1946
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	667
	01-02	*	< LOD	< LOD	< LOD	< LOD	756
	03-04	*	< LOD	< LOD	< LOD	< LOD	588
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1002
	01-02	*	< LOD	< LOD	< LOD	< LOD	1523
	03-04	*	< LOD	< LOD	< LOD	< LOD	1358
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	796
	01-02	*	< LOD	< LOD	< LOD	< LOD	1059
	03-04	*	< LOD	< LOD	< LOD	< LOD	949
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	873
	01-02	*	< LOD	< LOD	< LOD	< LOD	1220
	03-04	*	< LOD	< LOD	< LOD	< LOD	997
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	632
	01-02	*	< LOD	< LOD	< LOD	< LOD	565
	03-04	*	< LOD	< LOD	< LOD	< LOD	458
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	354
	01-02	*	< LOD	< LOD	< LOD	< LOD	507
	03-04	*	< LOD	< LOD	< LOD	< LOD	486
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	560
	01-02	*	< LOD	< LOD	< LOD	< LOD	1045
	03-04	*	< LOD	< LOD	< LOD	< LOD	880

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Serum Hexachlorobenzene (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1702
	01-02	*	< LOD	< LOD	< LOD	< LOD	2277
	03-04	15.2 (14.5-15.9)	14.9 (14.2-15.7)	19.0 (18.1-20.3)	24.4 (22.6-26.4)	28.9 (25.6-32.8)	1961
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	591
	01-02	*	< LOD	< LOD	< LOD	< LOD	747
	03-04	13.3 (12.5-14.1)	13.4 (11.5-14.9)	16.7 (15.5-18.4)	20.7 (19.7-22.7)	25.3 (22.7-30.2)	588
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1111
	01-02	*	< LOD	< LOD	< LOD	< LOD	1530
	03-04	15.5 (14.7-16.2)	15.1 (14.5-15.9)	19.4 (18.3-20.9)	24.8 (22.7-26.6)	29.0 (25.6-33.6)	1373
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	807
	01-02	*	< LOD	< LOD	< LOD	< LOD	1058
	03-04	14.5 (13.8-15.3)	14.2 (13.4-15.0)	18.1 (17.0-19.3)	23.6 (21.0-25.6)	26.9 (25.2-31.3)	957
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	895
	01-02	*	< LOD	< LOD	< LOD	< LOD	1219
	03-04	15.8 (15.0-16.6)	15.7 (15.1-16.4)	20.0 (18.7-21.4)	24.9 (23.0-28.6)	29.8 (26.5-33.7)	1004
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	583
	01-02	*	< LOD	< LOD	< LOD	< LOD	554
	03-04	16.2 (14.9-17.7)	15.3 (14.7-16.4)	20.4 (18.3-22.5)	27.6 (24.7-29.4)	33.7 (27.6-44.6)	460
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	350
	01-02	*	< LOD	< LOD	< LOD	< LOD	511
	03-04	14.5 (13.9-15.0)	14.1 (13.7-15.1)	18.3 (16.6-19.9)	22.3 (20.9-24.0)	26.6 (23.9-30.9)	488
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	636
	01-02	*	< LOD	< LOD	< LOD	< LOD	1052
	03-04	15.1 (14.4-16.0)	15.0 (14.2-15.9)	19.2 (17.9-20.8)	24.3 (22.3-26.4)	28.2 (24.9-32.8)	888

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 118.0, 31.4, and 7.8, respectively. < LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Hexachlorobenzene_BiomonitoringSummary.html

Serum Hexachlorobenzene (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	7.62	1.17	9
		07-08	12.4	0.8	6
		09-10	9.69	0.56	10
	20-39	05-06	7.34	0.41	12
		07-08	9.45	0.46	15
		09-10	8.56	0.17	17
	40-59	05-06	8.85	0.38	12
		07-08	10.1	0.3	16
		09-10	9.29	0.44	17
60+	05-06	11.1	0.5	15	
	07-08	11.8	0.5	23	
	09-10	9.95	0.43	21	
Non-Hispanic White Female	12-19	05-06	5.44	0.49	10
		07-08	7.06	0.29	7
		09-10	7.36	0.38	8
	20-39	05-06	7.11	0.33	16
		07-08	7.94	0.23	13
		09-10	7.57	0.25	19
	40-59	05-06	9.25	0.44	13
		07-08	10.8	0.7	17
		09-10	11.1	1	17
	60+	05-06	13.9	0.7	17
		07-08	15.1	0.7	21
		09-10	14.9	1.2	22
Non-Hispanic Black Male	12-19	05-06	6.42	0.37	13
		07-08	9.67	0.79	6
		09-10	7.82	0.99	6
	20-39	05-06	5.77	0.38	6
		07-08	9.11	0.58	6
		09-10	7.45	0.61	7
	40-59	05-06	7.19	0.45	5
		07-08	9.58	0.43	6
		09-10	9.27	0.65	7
	60+	05-06	10.9	1.6	5
		07-08	10.3	0.6	8
		09-10	10.1	0.5	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 4.17, 1.4, and 3.11, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Hexachlorobenzene_BiomonitoringSummary.html

Serum Hexachlorobenzene (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	4.41	0.27	14
		07-08	7.20	0.57	5
		09-10	5.97	0.49	6
	20-39	05-06	5.90	0.64	7
		07-08	7.04	0.3	8
		09-10	6.41	0.27	7
	40-59	05-06	9.19	0.42	7
		07-08	9.90	0.58	8
		09-10	8.58	0.68	7
	60+	05-06	18.1	1.9	5
07-08		15.1	1.2	7	
09-10		15.6	0.8	7	
Mexican American Male	12-19	05-06	6.25	0.43	11
		07-08	9.49	0.7	6
		09-10	11.3	0.3	8
	20-39	05-06	9.61	1.74	9
		07-08	9.47	0.57	9
		09-10	11.5	1.6	8
	40-59	05-06	14.0	1.9	4
		07-08	**20.6	8.3	6
		09-10	14.7	2.4	8
	60+	05-06	10.5	1.3	4
07-08		12.1	0.8	5	
09-10		12.7	0.3	5	
Mexican American Female	12-19	05-06	5.93	0.55	16
		07-08	6.81	0.44	5
		09-10	7.48	0.39	7
	20-39	05-06	9.78	0.81	9
		07-08	10.4	0.7	8
		09-10	8.88	0.59	10
	40-59	05-06	15.9	1.4	6
		07-08	20.6	2.6	6
		09-10	12.3	0.7	9
	60+	05-06	19.6	2.6	3
07-08		20.7	1.9	5	
09-10		21.8	3.4	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 4.17, 1.4, and 3.11, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Hexachlorobenzene_BiomonitoringSummary.html

Serum Hexachlorobenzene (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	10.5	0.5	11
	20-39	09-10	10.5	1.1	13
	40-59	09-10	13.1	1.6	13
	60+	09-10	12.0	0.4	8
All Hispanic Female	12-19	09-10	7.11	0.35	10
	20-39	09-10	8.26	0.5	14
	40-59	09-10	15.2	2.7	14
	60+	09-10	**22.8	8.4	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 4.17, 1.4, and 3.11, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Hexachlorobenzene_BiomonitoringSummary.html

Serum Hexachlorobenzene (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1702
	01-02	*	< LOD	< LOD	< LOD	< LOD	2277
	03-04	.092 (.088-.097)	.090 (.086-.095)	.120 (.113-.126)	.157 (.145-.167)	.186 (.169-.212)	1961
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	591
	01-02	*	< LOD	< LOD	< LOD	< LOD	747
	03-04	.065 (.062-.069)	.064 (.060-.069)	.079 (.072-.086)	.102 (.091-.111)	.123 (.111-.141)	588
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1111
	01-02	*	< LOD	< LOD	< LOD	< LOD	1530
	03-04	.097 (.092-.102)	.095 (.090-.099)	.123 (.118-.130)	.160 (.147-.175)	.191 (.174-.223)	1373
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	807
	01-02	*	< LOD	< LOD	< LOD	< LOD	1058
	03-04	.090 (.085-.095)	.087 (.082-.094)	.115 (.107-.122)	.147 (.135-.163)	.179 (.159-.203)	957
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	895
	01-02	*	< LOD	< LOD	< LOD	< LOD	1219
	03-04	.095 (.089-.100)	.092 (.088-.099)	.123 (.118-.132)	.163 (.148-.176)	.190 (.176-.226)	1004
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	583
	01-02	*	< LOD	< LOD	< LOD	< LOD	554
	03-04	.098 (.089-.109)	.090 (.081-.107)	.125 (.114-.152)	.171 (.157-.203)	.225 (.178-.258)	460
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	350
	01-02	*	< LOD	< LOD	< LOD	< LOD	511
	03-04	.081 (.077-.085)	.078 (.073-.083)	.104 (.095-.118)	.140 (.127-.155)	.167 (.145-.196)	488
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	636
	01-02	*	< LOD	< LOD	< LOD	< LOD	1052
	03-04	.094 (.088-.099)	.092 (.086-.097)	.121 (.114-.129)	.156 (.143-.173)	.182 (.163-.218)	888

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Hexachlorobenzene_BiomonitoringSummary.html

Serum Hexachlorobenzene (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	.043	0.008	9
		07-08	.062	0.003	6
		09-10	51.6	3	10
	20-39	05-06	.054	0.004	12
		07-08	.062	0.003	15
		09-10	56.0	1.8	17
	40-59	05-06	.067	0.003	12
		07-08	.074	0.003	16
		09-10	63.3	3.5	17
60+	05-06	.076	0.002	15	
	07-08	.075	0.003	23	
	09-10	60.4	2.7	21	
Non-Hispanic White Female	12-19	05-06	.029	0.003	10
		07-08	.033	0.001	7
		09-10	35.1	2.2	8
	20-39	05-06	.046	0.002	16
		07-08	.047	0.002	13
		09-10	40.1	1.2	19
	40-59	05-06	.069	0.005	13
		07-08	.071	0.005	17
		09-10	70.4	7.3	17
	60+	05-06	.102	0.005	17
		07-08	.102	0.004	21
		09-10	89.9	6.5	22
Non-Hispanic Black Male	12-19	05-06	.032	0.001	13
		07-08	.046	0.004	6
		09-10	35.9	5.1	6
	20-39	05-06	.034	0.003	6
		07-08	.051	0.003	6
		09-10	41.9	3.5	7
	40-59	05-06	.046	0.003	5
		07-08	.061	0.003	6
		09-10	57.3	5.1	7
	60+	05-06	.064	0.008	5
		07-08	.062	0.003	8
		09-10	54.2	3.1	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Hexachlorobenzene_BiomonitoringSummary.html

Serum Hexachlorobenzene (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.022	0.001	14
		07-08	.034	0.003	5
		09-10	26.3	2.1	6
	20-39	05-06	.034	0.004	7
		07-08	.035	0.001	8
		09-10	31.7	1.8	7
	40-59	05-06	.059	0.003	7
		07-08	.059	0.004	8
		09-10	48.4	4	7
	60+	05-06	.121	0.012	5
07-08		.090	0.006	7	
09-10		89.6	5.2	7	
Mexican American Male	12-19	05-06	.034	0.002	11
		07-08	.050	0.003	6
		09-10	53.0	1.5	8
	20-39	05-06	.066	0.01	9
		07-08	.065	0.006	9
		09-10	70.5	10.5	8
	40-59	05-06	.113	0.011	4
		07-08	** .146	0.058	6
		09-10	98.8	14.1	8
	60+	05-06	.076	0.011	4
07-08		.089	0.011	5	
09-10		78.3	3.6	5	
Mexican American Female	12-19	05-06	.032	0.003	16
		07-08	.033	0.002	5
		09-10	35.0	1.8	7
	20-39	05-06	.066	0.008	9
		07-08	.060	0.004	8
		09-10	48.7	3.5	10
	40-59	05-06	.117	0.01	6
		07-08	.138	0.016	6
		09-10	80.4	7.6	9
	60+	05-06	.148	0.02	3
07-08		.141	0.013	5	
09-10		122	20	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Hexachlorobenzene_BiomonitoringSummary.html

Serum Hexachlorobenzene (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	48.9	2.5	11
	20-39	09-10	66.3	7.2	13
	40-59	09-10	88.4	9.8	13
	60+	09-10	75.8	3.6	8
All Hispanic Female	12-19	09-10	33.0	1.7	10
	20-39	09-10	45.6	2.9	14
	40-59	09-10	95.8	17.7	14
	60+	09-10	**139	59	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Hexachlorobenzene_BiomonitoringSummary.html

Serum beta-Hexachlorocyclohexane (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	9.68 (<LOD-10.9)	< LOD	19.1 (16.0-21.6)	42.0 (33.4-50.6)	68.9 (50.6-89.5)	1893
	01-02	*	< LOD	16.0 (14.2-17.3)	36.7 (30.4-45.7)	67.2 (50.3-85.7)	2291
	03-04	*	< LOD	14.1 (12.1-16.5)	32.1 (27.1-37.8)	56.5 (43.7-69.4)	1959
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	11.7 (<LOD-16.1)	653
	01-02	*	< LOD	< LOD	< LOD	13.1 (9.70-19.0)	758
	03-04	*	< LOD	< LOD	< LOD	8.80 (<LOD-14.7)	589
20 years and older	99-00	10.9 (9.61-12.4)	< LOD	21.1 (18.9-24.0)	46.0 (35.9-56.8)	73.4 (52.7-96.0)	1240
	01-02	9.87 (9.04-10.8)	7.80 (6.90-8.90)	17.4 (16.0-20.5)	39.6 (33.2-52.0)	71.7 (53.7-96.2)	1533
	03-04	7.89 (<LOD-9.09)	< LOD	16.3 (13.6-18.4)	35.2 (29.6-42.5)	62.2 (48.2-87.6)	1370
Gender Males	99-00	*	< LOD	14.6 (10.8-19.1)	29.8 (23.3-38.7)	44.9 (32.8-68.9)	901
	01-02	*	< LOD	12.9 (11.1-15.7)	27.5 (24.0-34.4)	45.7 (35.2-55.6)	1067
	03-04	*	< LOD	10.4 (8.70-12.5)	21.6 (17.7-26.4)	35.3 (26.1-49.9)	952
Females	99-00	11.1 (9.56-12.8)	< LOD	22.0 (19.1-27.6)	51.3 (42.2-67.6)	81.8 (64.4-111)	992
	01-02	10.2 (9.46-11.0)	7.70 (6.90-8.50)	18.5 (16.2-22.7)	47.5 (37.6-62.0)	84.7 (62.0-111)	1224
	03-04	8.43 (<LOD-9.45)	< LOD	18.6 (16.9-21.5)	41.8 (33.9-51.4)	70.3 (62.2-98.4)	1007
Race/ethnicity Mexican Americans	99-00	16.7 (13.7-20.2)	15.5 (11.6-20.4)	37.7 (29.6-47.3)	97.9 (62.6-135)	142 (99.8-199)	632
	01-02	13.1 (11.6-14.7)	11.8 (9.60-13.4)	25.8 (21.1-32.7)	69.4 (50.8-87.6)	134 (85.7-166)	563
	03-04	10.5 (8.66-12.8)	10.0 (<LOD-12.7)	23.8 (17.5-29.9)	50.1 (30.0-70.3)	70.3 (42.5-123)	460
Non-Hispanic blacks	99-00	*	< LOD	15.4 (12.0-23.1)	37.9 (30.2-42.2)	49.9 (40.9-81.1)	403
	01-02	*	< LOD	12.0 (8.20-16.2)	36.2 (18.4-73.4)	71.2 (31.9-178)	513
	03-04	*	< LOD	9.70 (8.30-11.9)	27.1 (21.1-36.3)	48.2 (34.8-54.3)	487
Non-Hispanic whites	99-00	*	< LOD	17.5 (14.2-20.5)	34.7 (25.2-46.1)	51.6 (40.0-70.8)	702
	01-02	*	< LOD	14.4 (11.8-16.8)	31.9 (26.6-37.8)	52.0 (37.7-69.5)	1051
	03-04	*	< LOD	12.8 (10.9-14.7)	27.6 (22.1-32.2)	40.8 (32.3-56.5)	887

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 9.36, 6.76, and 7.8, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Hexachlorocyclohexane_BiomonitoringSummary.html

Serum beta-Hexachlorocyclohexane (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	**3.53	1.51	12
		07-08	*	*	15
		09-10	*	*	17
	40-59	05-06	4.44	0.23	12
		07-08	3.34	0.35	16
		09-10	3.00	0.22	17
	60+	05-06	14.3	2.1	15
		07-08	11.3	2.6	23
		09-10	8.84	1.14	20
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	2.79	0.55	16
		07-08	*	*	13
		09-10	2.19	0.5	19
	40-59	05-06	7.32	0.81	13
		07-08	3.90	1	17
		09-10	**9.70	3.19	17
	60+	05-06	19.6	1.3	17
		07-08	17.3	1.7	21
		09-10	16.6	1.7	21
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	6
	20-39	05-06	2.00	0.39	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	5.64	1.62	5
		07-08	3.62	0.43	6
		09-10	4.19	0.97	6
	60+	05-06	15.0	3.5	5
		07-08	7.79	1.2	8
		09-10	7.12	0.88	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.46, 1.4, and 2.19, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Hexachlorocyclohexane_BiomonitoringSummary.html

Serum beta-Hexachlorocyclohexane (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	**3.89	1.98	7
		07-08	*	*	8
		09-10	*	*	6
	40-59	05-06	9.50	1.59	7
		07-08	6.79	1.13	8
		09-10	**8.52	2.96	6
	60+	05-06	56.1	12.3	5
07-08		34.4	5.5	7	
09-10		31.6	6.8	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	10.7	2.2	9
		07-08	5.59	1.57	9
		09-10	**5.07	1.81	8
	40-59	05-06	**23.7	8.6	4
		07-08	16.6	5	6
		09-10	14.4	4.1	8
	60+	05-06	20.5	1.6	4
07-08		21.9	5.7	5	
09-10		20.7	2.9	5	
Mexican American Female	12-19	05-06	3.50	0.67	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	12.0	2.2	9
		07-08	5.65	1.61	8
		09-10	**10.2	3.3	9
	40-59	05-06	25.3	3.5	6
		07-08	16.8	2.1	6
		09-10	21.9	3.3	9
	60+	05-06	36.8	5.5	3
07-08		50.2	8.6	5	
09-10		56.9	9.3	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.46, 1.4, and 2.19, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Hexachlorocyclohexane_BiomonitoringSummary.html

Serum beta-Hexachlorocyclohexane (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	**5.24	1.58	13
	40-59	09-10	10.8	2.8	13
	60+	09-10	17.8	2.5	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	8.31	2.42	13
	40-59	09-10	20.3	4.2	14
	60+	09-10	45.4	7.6	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.46, 1.4, and 2.19, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Hexachlorocyclohexane_BiomonitoringSummary.html

Serum beta-Hexachlorocyclohexane (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	.058 (<LOD-.066)	< LOD	.120 (.100-.150)	.290 (.220-.360)	.450 (.360-.560)	1893
	01-02	*	< LOD	.100 (.090-.120)	.250 (.210-.310)	.460 (.340-.600)	2291
	03-04	*	< LOD	.092 (.081-.103)	.216 (.173-.254)	.372 (.294-.442)	1959
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	.050 (<LOD-.070)	653
	01-02	*	< LOD	< LOD	< LOD	.080 (.050-.100)	758
	03-04	*	< LOD	< LOD	< LOD	.048 (<LOD-.064)	589
20 years and older	99-00	.067 (.059-.077)	< LOD	.140 (.120-.160)	.330 (.240-.410)	.480 (.410-.620)	1240
	01-02	.062 (.057-.069)	.050 (.050-.060)	.120 (.100-.140)	.270 (.230-.350)	.480 (.370-.690)	1533
	03-04	.050 (<LOD-.058)	< LOD	.103 (.089-.125)	.234 (.191-.290)	.412 (.308-.587)	1370
Gender Males	99-00	*	< LOD	.090 (.080-.120)	.210 (.160-.250)	.290 (.220-.470)	901
	01-02	*	< LOD	.080 (.070-.100)	.200 (.150-.260)	.310 (.250-.400)	1067
	03-04	*	< LOD	.072 (.056-.089)	.144 (.118-.174)	.222 (.170-.305)	952
Females	99-00	.065 (.056-.077)	< LOD	.150 (.120-.190)	.380 (.300-.450)	.560 (.420-.680)	992
	01-02	.062 (.057-.067)	.050 (.040-.050)	.130 (.110-.150)	.320 (.260-.400)	.570 (.450-.710)	1224
	03-04	.051 (<LOD-.057)	< LOD	.118 (.103-.130)	.290 (.244-.319)	.442 (.382-.661)	1007
Race/ethnicity Mexican Americans	99-00	.098 (.080-.119)	.090 (.070-.110)	.240 (.200-.310)	.580 (.390-.840)	.910 (.580-1.37)	632
	01-02	.078 (.068-.091)	.070 (.050-.080)	.160 (.130-.210)	.470 (.330-.700)	1.01 (.620-1.32)	563
	03-04	.064 (.051-.080)	.057 (<LOD-.086)	.139 (.124-.190)	.331 (.191-.501)	.521 (.297-.814)	460
Non-Hispanic blacks	99-00	*	< LOD	.100 (.070-.140)	.250 (.190-.290)	.360 (.280-.460)	403
	01-02	*	< LOD	.070 (.050-.110)	.220 (.120-.410)	.410 (.190-1.05)	513
	03-04	*	< LOD	.065 (.047-.083)	.167 (.131-.214)	.281 (.200-.404)	487
Non-Hispanic whites	99-00	*	< LOD	.120 (.100-.140)	.250 (.170-.340)	.390 (.280-.510)	702
	01-02	*	< LOD	.090 (.080-.110)	.210 (.180-.260)	.350 (.250-.480)	1051
	03-04	*	< LOD	.083 (.073-.096)	.175 (.146-.220)	.287 (.221-.372)	887

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Hexachlorocyclohexane_BiomonitoringSummary.html

Serum beta-Hexachlorocyclohexane (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	** .028	0.013	12
		07-08	*	*	15
		09-10	*	*	17
	40-59	05-06	.033	0.002	12
		07-08	.025	0.003	16
		09-10	20.3	1.4	17
60+	05-06	.095	0.012	15	
	07-08	.071	0.015	23	
	09-10	53.0	6.6	20	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	.018	0.004	16
		07-08	*	*	13
		09-10	11.6	2.5	19
	40-59	05-06	.055	0.007	13
		07-08	.026	0.007	17
		09-10	**60.4	19.5	17
	60+	05-06	.142	0.008	17
		07-08	.117	0.012	21
		09-10	99.8	9.3	21
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	6
	20-39	05-06	.012	0.002	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	.036	0.011	5
		07-08	.023	0.003	6
		09-10	26.6	6.1	6
	60+	05-06	.087	0.018	5
		07-08	.047	0.007	8
		09-10	37.8	4.5	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Hexachlorocyclohexane_BiomonitoringSummary.html

Serum beta-Hexachlorocyclohexane (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	**0.021	0.01	7
		07-08	*	*	8
		09-10	*	*	6
	40-59	05-06	.062	0.011	7
		07-08	.041	0.007	8
		09-10	**46.5	15	6
	60+	05-06	.369	0.07	5
07-08		.204	0.029	7	
09-10		180	36	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	.075	0.015	9
		07-08	**0.041	0.013	9
		09-10	**33.7	13.8	8
	40-59	05-06	**185	0.058	4
		07-08	**120	0.038	6
		09-10	**101	31	8
	60+	05-06	.150	0.02	4
07-08		**171	0.058	5	
09-10		130	23	5	
Mexican American Female	12-19	05-06	.019	0.003	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	.082	0.016	9
		07-08	.033	0.009	8
		09-10	**55.3	17.7	9
	40-59	05-06	.186	0.025	6
		07-08	.114	0.015	6
		09-10	141	21	9
	60+	05-06	.275	0.037	3
07-08		.344	0.06	5	
		09-10	322	58	6

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Hexachlorocyclohexane_BiomonitoringSummary.html

Serum beta-Hexachlorocyclohexane (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	**38.6	14	13
	40-59	09-10	75.0	20.8	13
	60+	09-10	115	19	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	45.2	12.9	13
	40-59	09-10	129	27	14
	60+	09-10	268	46	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Hexachlorocyclohexane_BiomonitoringSummary.html

Serum gamma-Hexachlorocyclohexane (Lindane) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1799
	01-02	*	< LOD	< LOD	< LOD	< LOD	2280
	03-04	*	< LOD	< LOD	< LOD	< LOD	1960
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	660
	01-02	*	< LOD	< LOD	< LOD	< LOD	758
	03-04	*	< LOD	< LOD	< LOD	< LOD	593
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1139
	01-02	*	< LOD	< LOD	< LOD	< LOD	1522
	03-04	*	< LOD	< LOD	< LOD	< LOD	1367
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	863
	01-02	*	< LOD	< LOD	< LOD	< LOD	1060
	03-04	*	< LOD	< LOD	< LOD	< LOD	952
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	936
	01-02	*	< LOD	< LOD	< LOD	< LOD	1220
	03-04	*	< LOD	< LOD	< LOD	< LOD	1008
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	631
	01-02	*	< LOD	< LOD	< LOD	< LOD	563
	03-04	*	< LOD	< LOD	< LOD	< LOD	461
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	380
	01-02	*	< LOD	< LOD	< LOD	< LOD	509
	03-04	*	< LOD	< LOD	< LOD	< LOD	490
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	646
	01-02	*	< LOD	< LOD	< LOD	< LOD	1045
	03-04	*	< LOD	< LOD	< LOD	< LOD	884

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 14.5, 10.5, and 7.8, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Hexachlorocyclohexane_BiomonitoringSummary.html

Serum gamma-Hexachlorocyclohexane (Lindane) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	*	*	12
		07-08	*	*	15
		09-10	*	*	17
	40-59	05-06	*	*	12
		07-08	*	*	16
		09-10	*	*	17
60+	05-06	*	*	15	
	07-08	*	*	23	
	09-10	*	*	21	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	*	*	16
		07-08	*	*	13
		09-10	*	*	19
	40-59	05-06	*	*	13
		07-08	*	*	17
		09-10	*	*	17
60+	05-06	*	*	17	
	07-08	*	*	21	
	09-10	*	*	22	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	6
	20-39	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	*	*	5
		07-08	*	*	6
		09-10	*	*	7
60+	05-06	*	*	5	
	07-08	*	*	8	
	09-10	*	*	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.46, 1.4, and 2.19, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Hexachlorocyclohexane_BiomonitoringSummary.html

Serum gamma-Hexachlorocyclohexane (Lindane) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
60+	05-06	*	*	5	
	07-08	*	*	7	
	09-10	*	*	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	*	*	9
		07-08	*	*	9
		09-10	*	*	8
	40-59	05-06	*	*	4
		07-08	*	*	6
		09-10	*	*	8
60+	05-06	*	*	4	
	07-08	*	*	5	
	09-10	*	*	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	8
		09-10	*	*	10
	40-59	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	9
60+	05-06	*	*	3	
	07-08	*	*	5	
	09-10	*	*	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.46, 1.4, and 2.19, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Hexachlorocyclohexane_BiomonitoringSummary.html

Serum gamma-Hexachlorocyclohexane (Lindane) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	*	*	13
	40-59	09-10	*	*	13
	60+	09-10	*	*	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	*	*	14
	60+	09-10	*	*	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.46, 1.4, and 2.19, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Hexachlorocyclohexane_BiomonitoringSummary.html

Serum gamma-Hexachlorocyclohexane (Lindane) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1799
	01-02	*	< LOD	< LOD	< LOD	< LOD	2280
	03-04	*	< LOD	< LOD	< LOD	< LOD	1960
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	660
	01-02	*	< LOD	< LOD	< LOD	< LOD	758
	03-04	*	< LOD	< LOD	< LOD	< LOD	593
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1139
	01-02	*	< LOD	< LOD	< LOD	< LOD	1522
	03-04	*	< LOD	< LOD	< LOD	< LOD	1367
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	863
	01-02	*	< LOD	< LOD	< LOD	< LOD	1060
	03-04	*	< LOD	< LOD	< LOD	< LOD	952
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	936
	01-02	*	< LOD	< LOD	< LOD	< LOD	1220
	03-04	*	< LOD	< LOD	< LOD	< LOD	1008
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	631
	01-02	*	< LOD	< LOD	< LOD	< LOD	563
	03-04	*	< LOD	< LOD	< LOD	< LOD	461
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	380
	01-02	*	< LOD	< LOD	< LOD	< LOD	509
	03-04	*	< LOD	< LOD	< LOD	< LOD	490
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	646
	01-02	*	< LOD	< LOD	< LOD	< LOD	1045
	03-04	*	< LOD	< LOD	< LOD	< LOD	884

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Hexachlorocyclohexane_BiomonitoringSummary.html

Serum gamma-Hexachlorocyclohexane (Lindane) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	*	*	12
		07-08	*	*	15
		09-10	*	*	17
	40-59	05-06	*	*	12
		07-08	*	*	16
		09-10	*	*	17
60+	05-06	*	*	15	
	07-08	*	*	23	
	09-10	*	*	21	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	*	*	16
		07-08	*	*	13
		09-10	*	*	19
	40-59	05-06	*	*	13
		07-08	*	*	17
		09-10	*	*	17
60+	05-06	*	*	17	
	07-08	*	*	21	
	09-10	*	*	22	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	6
	20-39	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	*	*	5
		07-08	*	*	6
		09-10	*	*	7
60+	05-06	*	*	5	
	07-08	*	*	8	
	09-10	*	*	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Hexachlorocyclohexane_BiomonitoringSummary.html

Serum gamma-Hexachlorocyclohexane (Lindane) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
	60+	05-06	*	*	5
07-08		*	*	7	
09-10		*	*	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	*	*	9
		07-08	*	*	9
		09-10	*	*	8
	40-59	05-06	*	*	4
		07-08	*	*	6
		09-10	*	*	8
	60+	05-06	*	*	4
07-08		*	*	5	
09-10		*	*	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	8
		09-10	*	*	10
	40-59	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	9
	60+	05-06	*	*	3
07-08		*	*	5	
09-10		*	*	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Hexachlorocyclohexane_BiomonitoringSummary.html

Serum gamma-Hexachlorocyclohexane (Lindane) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	*	*	13
	40-59	09-10	*	*	13
	60+	09-10	*	*	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	*	*	14
	60+	09-10	*	*	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Hexachlorocyclohexane_BiomonitoringSummary.html

Serum Mirex (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1853
	01-02	*	< LOD	< LOD	15.8 (<LOD-73.7)	57.1 (13.2-230)	2257
	03-04	*	< LOD	< LOD	8.40 (<LOD-13.0)	13.2 (7.90-29.6)	1951
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	659
	01-02	*	< LOD	< LOD	< LOD	< LOD	728
	03-04	*	< LOD	< LOD	< LOD	< LOD	592
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1194
	01-02	*	< LOD	< LOD	19.6 (<LOD-108)	71.0 (14.6-305)	1529
	03-04	*	< LOD	< LOD	9.10 (<LOD-15.6)	15.4 (8.10-37.1)	1359
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	887
	01-02	*	< LOD	< LOD	16.1 (<LOD-65.6)	50.8 (12.3-225)	1052
	03-04	*	< LOD	< LOD	9.70 (<LOD-15.4)	15.5 (9.70-24.4)	949
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	966
	01-02	*	< LOD	< LOD	15.0 (<LOD-108)	63.0 (12.0-374)	1205
	03-04	*	< LOD	< LOD	< LOD	11.6 (<LOD-31.3)	1002
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	617
	01-02	*	< LOD	< LOD	< LOD	< LOD	548
	03-04	*	< LOD	< LOD	< LOD	< LOD	459
Non-Hispanic blacks	99-00	*	< LOD	< LOD	15.5 (<LOD-42.2)	39.5 (<LOD-115)	398
	01-02	*	< LOD	13.7 (<LOD-47.3)	51.3 (15.4-230)	153 (30.5-425)	500
	03-04	*	< LOD	< LOD	18.1 (8.70-40.8)	40.3 (15.5-82.7)	484
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	688
	01-02	*	< LOD	< LOD	15.1 (<LOD-104)	66.7 (12.5-291)	1049
	03-04	*	< LOD	< LOD	< LOD	11.6 (<LOD-23.4)	884

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 14.6, 10.5, and 7.8, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Mirex_BiomonitoringSummary.html

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.46, 1.4, and 2.19, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%. **Serum Mirex (lipid adjusted) (2005 – 2010)**

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	**3.88	2.18	12
		07-08	*	*	15
		09-10	*	*	17
	40-59	05-06	**6.39	2.15	12
		07-08	4.25	0.31	16
		09-10	5.25	1.32	17
	60+	05-06	5.32	0.61	15
		07-08	6.36	1.34	23
		09-10	4.89	0.44	21
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	*	*	16
		07-08	*	*	13
		09-10	*	*	19
	40-59	05-06	2.42	0.14	13
		07-08	2.05	0.28	17
		09-10	3.32	0.33	17
	60+	05-06	3.51	0.24	17
		07-08	3.90	0.39	21
		09-10	4.42	0.4	22
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	6
	20-39	05-06	2.68	0.59	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	5.90	0.49	5
		07-08	**16.8	6.1	6
		09-10	6.44	1.04	7
	60+	05-06	**27.2	10.1	5
		07-08	13.9	2.1	8
		09-10	14.2	4.1	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation. ‡ Each pool was composed of serum from 8 persons. Weighted arithmetic means are not comparable to weighted geometric means. Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-

10 are 1.46, 1.4, and 2.19, respectively. * Not calculated: proportion of results below limit of detection was too high to provide a valid result. ** Standard error of the mean estimate is > 30%.

Serum Mirex (lipid adjusted)

(2005 - 2010) Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations[†] (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	1.62	0.32	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	5.92	0.65	7
		07-08	5.42	1.21	8
		09-10	5.03	0.84	7
60+	05-06	10.3	2.7	5	
	07-08	**24.0	9.3	7	
	09-10	7.49	1.68	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	*	*	9
		07-08	*	*	9
		09-10	*	*	8
	40-59	05-06	2.66	0.74	4
		07-08	**4.37	1.38	6
		09-10	3.08	0.83	8
60+	05-06	2.89	0.78	4	
	07-08	**11.0	8	5	
	09-10	5.10	1.27	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	8
		09-10	*	*	10
	40-59	05-06	1.84	0.34	6
		07-08	**3.76	1.3	6
		09-10	*	*	9
60+	05-06	2.84	0.37	3	
	07-08	2.59	0.49	5	
	09-10	4.04	0.97	6	

†See Special Analysis of Pooled Samples for Select Chemicals for additional explanation. ‡ Each pool was composed of serum from 8 persons. Weighted arithmetic means are not comparable to weighted geometric means. Unadjusted standard errors do not incorporate survey design effects. Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.46, 1.4, and 2.19, respectively. * Not calculated: proportion of results below limit of detection was too high to provide a valid result. ** Standard error of the mean estimate is > 30%.

Serum Mirex (lipid adjusted)

(2005 - 2010) Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations[†] (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools [‡]
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	*	*	13
	40-59	09-10	4.58	1.27	13
	60+	09-10	5.18	0.82	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	*	*	14
	60+	09-10	4.13	0.55	11

[†]See Special Analysis of Pooled Samples for Select Chemicals for additional explanation. [‡] Each pool was composed of serum from 8 persons. Weighted arithmetic means are not comparable to weighted geometric means. Unadjusted standard errors do not incorporate survey design effects. Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.46, 1.4, and 2.19, respectively. * Not calculated: proportion of results below limit of detection was too high to provide a valid result. ** Standard error of the mean estimate is > 30%.

http://www.cdc.gov/biomonitoring/Mirex_BiomonitoringSummary.html

Serum Mirex (lipid adjusted) (2005 - 2010)

)Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	1.62	0.32	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	5.92	0.65	7
		07-08	5.42	1.21	8
		09-10	5.03	0.84	7
60+	05-06	10.3	2.7	5	
	07-08	**24.0	9.3	7	
	09-10	7.49	1.68	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	*	*	9
		07-08	*	*	9
		09-10	*	*	8
	40-59	05-06	2.66	0.74	4
		07-08	**4.37	1.38	6
		09-10	3.08	0.83	8
60+	05-06	2.89	0.78	4	
	07-08	**11.0	8	5	
	09-10	5.10	1.27	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	8
		09-10	*	*	10
	40-59	05-06	1.84	0.34	6
		07-08	**3.76	1.3	6
		09-10	*	*	9
60+	05-06	2.84	0.37	3	
	07-08	2.59	0.49	5	
	09-10	4.04	0.97	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.46, 1.4, and 2.19, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Mirex_BiomonitoringSummary.html

Serum Mirex (lipid adjusted) (2005 - 2010)

)Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	*	*	13
	40-59	09-10	4.58	1.27	13
	60+	09-10	5.18	0.82	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	*	*	14
	60+	09-10	4.13	0.55	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.46, 1.4, and 2.19, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Mirex_BiomonitoringSummary.html

Serum Mirex (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1853
	01-02	*	< LOD	< LOD	.100 (<LOD-.470)	.410 (.080-1.73)	2257
	03-04	*	< LOD	< LOD	.054 (<LOD-.084)	.093 (.052-.170)	1951
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	659
	01-02	*	< LOD	< LOD	< LOD	< LOD	728
	03-04	*	< LOD	< LOD	< LOD	< LOD	592
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1194
	01-02	*	< LOD	< LOD	.140 (<LOD-.690)	.470 (.090-1.92)	1529
	03-04	*	< LOD	< LOD	.059 (<LOD-.102)	.106 (.053-.215)	1359
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	887
	01-02	*	< LOD	< LOD	.110 (<LOD-.470)	.370 (.090-1.37)	1052
	03-04	*	< LOD	< LOD	.064 (<LOD-.106)	.108 (.062-.170)	949
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	966
	01-02	*	< LOD	< LOD	.090 (<LOD-.510)	.430 (.070-1.79)	1205
	03-04	*	< LOD	< LOD	< LOD	.077 (<LOD-.170)	1002
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	617
	01-02	*	< LOD	< LOD	< LOD	< LOD	548
	03-04	*	< LOD	< LOD	< LOD	< LOD	459
Non-Hispanic blacks	99-00	*	< LOD	< LOD	.090 (<LOD-.220)	.220 (<LOD-.450)	398
	01-02	*	< LOD	.090 (<LOD-.240)	.310 (.090-1.41)	1.08 (.170-3.02)	500
	03-04	*	< LOD	< LOD	.112 (.055-.268)	.256 (.089-.635)	484
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	688
	01-02	*	< LOD	< LOD	.100 (<LOD-.610)	.450 (.080-1.79)	1049
	03-04	*	< LOD	< LOD	< LOD	.079 (<LOD-.174)	884

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Mirex_BiomonitoringSummary.html

Serum Mirex (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	** .027	0.014	12
		07-08	*	*	15
		09-10	*	*	17
	40-59	05-06	** .048	0.016	12
		07-08	.031	0.003	16
		09-10	34.2	7.7	17
60+	05-06	.036	0.004	15	
	07-08	.040	0.008	23	
	09-10	29.9	3	21	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	*	*	16
		07-08	*	*	13
		09-10	*	*	19
	40-59	05-06	.018	0.002	13
		07-08	.014	0.002	17
		09-10	21.1	2.1	17
	60+	05-06	.026	0.002	17
		07-08	.026	0.003	21
		09-10	26.7	2.3	22
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	6
	20-39	05-06	.016	0.004	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	.038	0.003	5
		07-08	** .109	0.04	6
		09-10	40.6	7.8	7
	60+	05-06	** .168	0.062	5
		07-08	.084	0.012	8
		09-10	76.4	22.7	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Mirex_BiomonitoringSummary.html

Serum Mirex (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	.009	0.002	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	.038	0.004	7
		07-08	.032	0.008	8
		09-10	28.1	4.6	7
	60+	05-06	.067	0.016	5
		07-08	**146	0.057	7
		09-10	43.1	9.8	7
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	*	*	9
		07-08	*	*	9
		09-10	*	*	8
	40-59	05-06	**022	0.007	4
		07-08	**031	0.01	6
		09-10	20.1	4.6	8
	60+	05-06	**022	0.008	4
		07-08	**074	0.052	5
		09-10	31.2	7.8	5
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	8
		09-10	*	*	10
	40-59	05-06	.014	0.003	6
		07-08	**024	0.008	6
		09-10	*	*	9
	60+	05-06	.022	0.005	3
		07-08	.018	0.003	5
		09-10	22.5	5.3	6

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Mirex_BiomonitoringSummary.html

Serum Mirex (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	*	*	13
	40-59	09-10	30.6	8.2	13
	60+	09-10	32.4	4.9	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	*	*	14
	60+	09-10	24.6	3.1	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Mirex_BiomonitoringSummary.html

Serum 2,2',4-Tribromodiphenyl ether (BDE 17) (lipid adjusted) (2003 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	03-04	*	< LOD	< LOD	< LOD	< LOD	1992
Age group							
12-19 years	03-04	*	< LOD	< LOD	< LOD	< LOD	607
20 years and older	03-04	*	< LOD	< LOD	< LOD	< LOD	1385
Gender							
Males	03-04	*	< LOD	< LOD	< LOD	< LOD	964
Females	03-04	*	< LOD	< LOD	< LOD	< LOD	1028
Race/ethnicity							
Mexican Americans	03-04	*	< LOD	< LOD	< LOD	< LOD	482
Non-Hispanic blacks	03-04	*	< LOD	< LOD	< LOD	< LOD	491
Non-Hispanic whites	03-04	*	< LOD	< LOD	< LOD	< LOD	892

Limit of detection (LOD, see Data Analysis section) for Survey year 03-04 is 1.0.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',4-Tribromodiphenyl ether (BDE 17) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	*	*	12
		07-08	*	*	15
		09-10	*	*	17
	40-59	05-06	*	*	12
		07-08	*	*	16
		09-10	*	*	17
60+	05-06	*	*	15	
	07-08	*	*	23	
	09-10	*	*	21	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	*	*	16
		07-08	*	*	13
		09-10	*	*	19
	40-59	05-06	*	*	13
		07-08	*	*	17
		09-10	*	*	16
60+	05-06	*	*	17	
	07-08	*	*	21	
	09-10	*	*	22	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	6
	20-39	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	*	*	5
		07-08	*	*	6
		09-10	*	*	7
60+	05-06	*	*	5	
	07-08	*	*	8	
	09-10	*	*	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.6, 0.6, and 0.59, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',4-Tribromodiphenyl ether (BDE 17) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	6
60+	05-06	*	*	5	
	07-08	*	*	7	
	09-10	*	*	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	*	*	9
		07-08	*	*	9
		09-10	*	*	8
	40-59	05-06	*	*	4
		07-08	*	*	6
		09-10	*	*	8
60+	05-06	*	*	4	
	07-08	*	*	5	
	09-10	*	*	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	8
		09-10	*	*	10
	40-59	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	9
60+	05-06	*	*	3	
	07-08	*	*	5	
	09-10	*	*	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.6, 0.6, and 0.59, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',4-Tribromodiphenyl ether (BDE 17) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	*	*	13
	40-59	09-10	*	*	13
	60+	09-10	*	*	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	*	*	14
	60+	09-10	*	*	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.6, 0.6, and 0.59, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,4,4'-Tribromodiphenyl ether (BDE 28) (lipid adjusted) (2003 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	03-04	1.19 (1.03-1.37)	1.10 (1.00-1.30)	2.20 (1.90-2.60)	4.80 (3.30-6.70)	8.00 (5.40-11.3)	1987
Age group							
12-19 years	03-04	1.30 (1.15-1.46)	1.20 (1.10-1.50)	2.40 (2.00-2.60)	4.00 (2.90-5.60)	6.10 (4.00-9.40)	598
20 years and older	03-04	1.17 (1.01-1.37)	1.10 (.900-1.30)	2.20 (1.90-2.70)	5.00 (3.30-7.20)	8.20 (6.00-10.9)	1389
Gender							
Males	03-04	1.21 (1.05-1.39)	1.10 (1.00-1.30)	2.30 (2.00-2.70)	5.10 (3.50-7.30)	8.20 (6.00-11.3)	964
Females	03-04	1.17 (.990-1.38)	1.10 (.900-1.40)	2.10 (1.80-2.60)	4.60 (3.00-6.90)	7.80 (4.70-11.8)	1023
Race/ethnicity							
Mexican Americans	03-04	1.43 (1.29-1.59)	1.40 (1.20-1.50)	2.40 (2.00-2.90)	4.70 (3.70-5.50)	7.30 (5.60-8.30)	488
Non-Hispanic blacks	03-04	1.21 (1.03-1.42)	1.10 (.900-1.30)	2.20 (1.80-2.50)	5.30 (3.50-6.70)	8.40 (5.40-12.3)	470
Non-Hispanic whites	03-04	1.17 (.968-1.42)	1.10 (.900-1.30)	2.20 (1.80-2.70)	4.90 (3.00-8.00)	8.00 (4.50-13.6)	905

Limit of detection (LOD, see Data Analysis section) for Survey year 03-04 is 0.8.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,4,4'-Tribromodiphenyl ether (BDE 28) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	1.82	0.44	9
		07-08	1.38	0.19	6
		09-10	1.68	0.48	10
	20-39	05-06	2.16	0.45	12
		07-08	1.37	0.16	15
		09-10	1.10	0.12	17
	40-59	05-06	1.23	0.12	12
		07-08	1.97	0.43	16
		09-10	1.09	0.15	17
60+	05-06	3.07	0.34	15	
	07-08	2.39	0.29	23	
	09-10	1.46	0.2	21	
Non-Hispanic White Female	12-19	05-06	2.37	0.49	10
		07-08	1.31	0.12	7
		09-10	.838	0.067	8
	20-39	05-06	1.70	0.32	16
		07-08	1.67	0.23	13
		09-10	.805	0.083	19
	40-59	05-06	1.44	0.2	13
		07-08	1.37	0.15	17
		09-10	1.09	0.15	16
	60+	05-06	2.59	0.55	17
		07-08	2.51	0.38	21
		09-10	2.02	0.22	22
Non-Hispanic Black Male	12-19	05-06	1.79	0.2	13
		07-08	1.21	0.1	6
		09-10	*	*	6
	20-39	05-06	1.38	0.19	6
		07-08	1.25	0.14	6
		09-10	.822	0.129	7
	40-59	05-06	1.47	0.35	5
		07-08	1.33	0.17	6
		09-10	2.30	0.52	7
	60+	05-06	1.91	0.5	5
		07-08	1.94	0.3	8
		09-10	2.34	0.34	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.6, 0.6, and 0.66, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,4,4'-Tribromodiphenyl ether (BDE 28) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	2.29	0.39	14
		07-08	**1.66	0.56	5
		09-10	1.19	0.23	6
	20-39	05-06	1.93	0.37	7
		07-08	1.61	0.21	8
		09-10	1.37	0.08	7
	40-59	05-06	**2.07	0.77	7
		07-08	1.29	0.11	8
		09-10	1.06	0.18	7
	60+	05-06	**1.76	0.56	5
07-08		2.33	0.61	7	
09-10		1.70	0.3	7	
Mexican American Male	12-19	05-06	2.04	0.21	11
		07-08	2.06	0.38	6
		09-10	1.88	0.25	8
	20-39	05-06	1.99	0.21	9
		07-08	1.52	0.21	9
		09-10	1.56	0.18	8
	40-59	05-06	2.06	0.13	4
		07-08	2.15	0.28	6
		09-10	1.64	0.25	8
	60+	05-06	2.38	0.14	4
07-08		2.87	0.84	5	
09-10		2.25	0.45	5	
Mexican American Female	12-19	05-06	2.08	0.19	16
		07-08	1.49	0.24	5
		09-10	1.79	0.23	7
	20-39	05-06	1.51	0.14	9
		07-08	1.84	0.42	8
		09-10	1.36	0.2	10
	40-59	05-06	1.57	0.29	6
		07-08	1.81	0.31	6
		09-10	1.68	0.22	9
	60+	05-06	3.29	0.62	3
07-08		2.34	0.33	5	
09-10		1.95	0.21	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.6, 0.6, and 0.66, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,4,4'-Tribromodiphenyl ether (BDE 28) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	1.65	0.22	11
	20-39	09-10	1.61	0.16	13
	40-59	09-10	1.53	0.17	13
	60+	09-10	1.90	0.34	8
All Hispanic Female	12-19	09-10	1.66	0.18	10
	20-39	09-10	1.21	0.15	14
	40-59	09-10	1.46	0.16	14
	60+	09-10	1.77	0.22	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.6, 0.6, and 0.66, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',4,4'-Tetrabromodiphenyl ether (BDE 47) (lipid adjusted) (2003 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	03-04	20.5 (17.6-23.9)	19.2 (15.7-22.3)	41.1 (35.6-49.2)	85.1 (66.8-127)	163 (108-240)	2016
Age group							
12-19 years	03-04	28.2 (24.6-32.3)	27.2 (22.1-33.6)	53.6 (44.9-63.6)	104 (82.4-145)	174 (115-211)	615
20 years and older	03-04	19.5 (16.5-23.1)	18.0 (14.6-21.6)	39.1 (32.8-47.0)	83.3 (63.0-127)	163 (102-240)	1401
Gender							
Males	03-04	21.4 (18.1-25.3)	19.2 (15.8-24.0)	45.2 (37.3-54.9)	94.3 (66.8-148)	168 (112-382)	981
Females	03-04	19.6 (16.4-23.5)	19.1 (14.1-23.2)	38.4 (31.8-46.4)	79.5 (60.7-121)	155 (102-239)	1035
Race/ethnicity							
Mexican Americans	03-04	25.5 (23.0-28.1)	23.6 (21.2-25.5)	47.1 (38.2-56.5)	87.2 (72.0-105)	151 (105-195)	478
Non-Hispanic blacks	03-04	24.3 (20.9-28.2)	21.4 (18.2-25.6)	47.5 (40.7-53.2)	116 (81.8-149)	242 (136-481)	499
Non-Hispanic whites	03-04	19.5 (16.1-23.7)	17.4 (14.4-22.2)	40.2 (33.1-51.9)	85.1 (60.3-142)	163 (90.2-283)	912

Limit of detection (LOD, see Data Analysis section) for Survey year 03-04 is 4.2.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',4,4'-Tetrabromodiphenyl ether (BDE 47) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	59.0	16.8	9
		07-08	32.9	4.8	6
		09-10	**46.8	16.5	10
	20-39	05-06	**46.1	14.4	12
		07-08	29.1	4.2	15
		09-10	25.7	4.1	17
	40-59	05-06	21.2	2.6	12
		07-08	38.7	9.7	16
		09-10	23.3	4.4	17
60+	05-06	67.3	12.4	15	
	07-08	40.1	6.5	23	
	09-10	26.0	4.8	21	
Non-Hispanic White Female	12-19	05-06	62.5	14.4	10
		07-08	31.2	3.2	7
		09-10	22.0	1.7	8
	20-39	05-06	**50.0	16.4	16
		07-08	32.2	6.6	13
		09-10	15.2	1.6	19
	40-59	05-06	22.5	4.6	13
		07-08	20.5	3.1	17
		09-10	17.1	2.3	17
60+	05-06	**60.0	20.4	17	
	07-08	40.4	7.5	21	
	09-10	33.6	5	22	
Non-Hispanic Black Male	12-19	05-06	51.3	4.9	13
		07-08	31.0	4.9	6
		09-10	20.3	3.5	6
	20-39	05-06	42.8	8.7	6
		07-08	28.1	3.3	6
		09-10	19.6	3.3	7
	40-59	05-06	29.6	6.9	5
		07-08	30.5	5.3	6
		09-10	**60.3	21.1	7
60+	05-06	65.8	18.9	5	
	07-08	31.8	4.1	8	
	09-10	68.4	19	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.6, 0.6, and 0.64, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',4,4'-Tetrabromodiphenyl ether (BDE 47) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	74.9	13.9	14
		07-08	**56.4	23.5	5
		09-10	36.6	6	6
	20-39	05-06	**61.0	21.6	7
		07-08	32.2	4.1	8
		09-10	36.3	2.3	7
	40-59	05-06	**59.0	26.9	7
		07-08	20.9	2.4	8
		09-10	22.0	5.4	7
	60+	05-06	41.4	8.5	5
07-08		46.4	12.5	7	
09-10		28.6	5.5	7	
Mexican American Male	12-19	05-06	46.8	5	11
		07-08	53.1	9.7	6
		09-10	45.3	6.4	8
	20-39	05-06	41.2	4.2	9
		07-08	33.9	6	9
		09-10	32.2	3.9	8
	40-59	05-06	36.4	3.7	4
		07-08	37.4	8.6	6
		09-10	25.1	3.5	8
	60+	05-06	36.8	2.9	4
07-08		41.5	6.6	5	
09-10		36.0	7.4	5	
Mexican American Female	12-19	05-06	50.7	5.4	16
		07-08	34.2	6	5
		09-10	37.6	4.6	7
	20-39	05-06	30.4	3.6	9
		07-08	31.2	8.1	8
		09-10	25.1	3.9	10
	40-59	05-06	25.4	4	6
		07-08	23.0	3	6
		09-10	29.6	4.1	9
	60+	05-06	52.9	12.1	3
07-08		37.8	6.9	5	
09-10		33.1	4	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.6, 0.6, and 0.64, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',4,4'-Tetrabromodiphenyl ether (BDE 47) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	40.2	5.3	11
	20-39	09-10	31.0	2.9	13
	40-59	09-10	26.7	3.3	13
	60+	09-10	29.8	5.7	8
All Hispanic Female	12-19	09-10	39.6	4.2	10
	20-39	09-10	23.3	2.9	14
	40-59	09-10	27.4	3.2	14
	60+	09-10	29.8	4.5	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.6, 0.6, and 0.64, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,3',4,4'-Tetrabromodiphenyl ether (BDE 66) (lipid adjusted) (2003 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	03-04	*	< LOD	< LOD	< LOD	1.30 (1.00-2.10)	1999
Age group							
12-19 years	03-04	*	< LOD	< LOD	< LOD	1.30 (<LOD-1.90)	606
20 years and older	03-04	*	< LOD	< LOD	< LOD	1.30 (1.00-2.20)	1393
Gender							
Males	03-04	*	< LOD	< LOD	< LOD	1.40 (1.00-2.60)	970
Females	03-04	*	< LOD	< LOD	< LOD	1.10 (<LOD-2.20)	1029
Race/ethnicity							
Mexican Americans	03-04	*	< LOD	< LOD	< LOD	1.20 (<LOD-1.60)	461
Non-Hispanic blacks	03-04	*	< LOD	< LOD	1.00 (<LOD-2.00)	2.40 (1.40-5.10)	496
Non-Hispanic whites	03-04	*	< LOD	< LOD	< LOD	1.20 (<LOD-2.50)	914

Limit of detection (LOD, see Data Analysis section) for Survey year 03-04 is 1.0.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,3',4,4'-Tetrabromodiphenyl ether (BDE 66) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	*	*	12
		07-08	*	*	15
		09-10	*	*	17
	40-59	05-06	*	*	12
		07-08	*	*	16
		09-10	*	*	17
60+	05-06	*	*	15	
	07-08	*	*	23	
	09-10	*	*	21	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	*	*	16
		07-08	*	*	13
		09-10	*	*	19
	40-59	05-06	*	*	13
		07-08	*	*	17
		09-10	*	*	17
60+	05-06	*	*	17	
	07-08	*	*	21	
	09-10	*	*	22	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	6
	20-39	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	*	*	5
		07-08	*	*	6
		09-10	** .494	0.227	7
60+	05-06	*	*	5	
	07-08	*	*	8	
	09-10	.536	0.142	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.6, 0.6, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,3',4,4'-Tetrabromodiphenyl ether (BDE 66) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
60+	05-06	*	*	5	
	07-08	*	*	7	
	09-10	*	*	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	*	*	9
		07-08	*	*	9
		09-10	*	*	8
	40-59	05-06	*	*	4
		07-08	*	*	6
		09-10	*	*	8
60+	05-06	*	*	4	
	07-08	*	*	5	
	09-10	*	*	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	8
		09-10	*	*	10
	40-59	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	9
60+	05-06	*	*	3	
	07-08	*	*	5	
	09-10	*	*	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.6, 0.6, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,3',4,4'-Tetrabromodiphenyl ether (BDE 66) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	*	*	13
	40-59	09-10	*	*	13
	60+	09-10	*	*	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	*	*	14
	60+	09-10	*	*	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.6, 0.6, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',3,4,4'-Pentabromodiphenyl ether (BDE 85) (lipid adjusted) (2003 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	03-04	*	< LOD	< LOD	< LOD	4.10 (2.80-6.30)	2000
Age group							
12-19 years	03-04	*	< LOD	< LOD	2.80 (<LOD-3.50)	4.00 (3.50-6.30)	610
20 years and older	03-04	*	< LOD	< LOD	< LOD	4.10 (2.50-6.70)	1390
Gender							
Males	03-04	*	< LOD	< LOD	2.40 (<LOD-3.30)	4.80 (3.10-8.40)	967
Females	03-04	*	< LOD	< LOD	< LOD	3.60 (<LOD-5.20)	1033
Race/ethnicity							
Mexican Americans	03-04	*	< LOD	< LOD	< LOD	3.70 (2.80-4.80)	484
Non-Hispanic blacks	03-04	*	< LOD	< LOD	3.50 (2.50-4.40)	6.90 (3.10-18.0)	493
Non-Hispanic whites	03-04	*	< LOD	< LOD	< LOD	3.90 (<LOD-7.50)	895

Limit of detection (LOD, see Data Analysis section) for Survey year 03-04 is 2.4.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',3,4,4'-Pentabromodiphenyl ether (BDE 85) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	**1.56	0.49	9
		07-08	.648	0.088	6
		09-10	**1.07	0.47	10
	20-39	05-06	**1.960	0.337	12
		07-08	.618	0.09	15
		09-10	.510	0.111	17
	40-59	05-06	*	*	12
		07-08	1.06	0.29	16
		09-10	*	*	17
	60+	05-06	1.58	0.32	15
		07-08	.971	0.197	23
		09-10	.486	0.106	21
Non-Hispanic White Female	12-19	05-06	1.50	0.41	10
		07-08	.807	0.166	7
		09-10	.447	0.065	8
	20-39	05-06	**1.26	0.43	16
		07-08	.804	0.207	13
		09-10	*	*	19
	40-59	05-06	*	*	13
		07-08	*	*	17
		09-10	*	*	17
	60+	05-06	**1.70	0.77	17
		07-08	.802	0.172	21
		09-10	.606	0.124	22
Non-Hispanic Black Male	12-19	05-06	1.14	0.11	13
		07-08	.763	0.149	6
		09-10	*	*	6
	20-39	05-06	1.08	0.2	6
		07-08	.727	0.104	6
		09-10	*	*	7
	40-59	05-06	*	*	5
		07-08	.829	0.141	6
		09-10	**1.53	0.71	7
	60+	05-06	**1.55	0.6	5
		07-08	.848	0.199	8
		09-10	**1.34	0.46	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.6, 0.6, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',3,4,4'-Pentabromodiphenyl ether (BDE 85) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	1.88	0.41	14
		07-08	**1.61	0.74	5
		09-10	.732	0.112	6
	20-39	05-06	**1.58	0.69	7
		07-08	.905	0.109	8
		09-10	.779	0.039	7
	40-59	05-06	**1.51	0.8	7
		07-08	*	*	8
		09-10	.455	0.128	7
	60+	05-06	1.11	0.32	5
07-08		1.16	0.33	7	
09-10		.625	0.141	7	
Mexican American Male	12-19	05-06	.899	0.078	11
		07-08	1.04	0.3	6
		09-10	.684	0.096	8
	20-39	05-06	.825	0.081	9
		07-08	.790	0.125	9
		09-10	.571	0.075	8
	40-59	05-06	.900	0.144	4
		07-08	.804	0.214	6
		09-10	.505	0.061	8
	60+	05-06	.683	0.167	4
07-08		.967	0.239	5	
09-10		.711	0.155	5	
Mexican American Female	12-19	05-06	1.00	0.1	16
		07-08	.766	0.147	5
		09-10	.687	0.096	7
	20-39	05-06	.662	0.098	9
		07-08	** .789	0.256	8
		09-10	.504	0.078	10
	40-59	05-06	*	*	6
		07-08	*	*	6
		09-10	.675	0.118	9
	60+	05-06	1.10	0.33	3
07-08		1.00	0.25	5	
09-10		.684	0.132	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.6, 0.6, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',3,4,4'-Pentabromodiphenyl ether (BDE 85) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	.605	0.081	11
	20-39	09-10	.554	0.055	13
	40-59	09-10	.602	0.1	13
	60+	09-10	.575	0.122	8
All Hispanic Female	12-19	09-10	.778	0.107	10
	20-39	09-10	.495	0.063	14
	40-59	09-10	.617	0.091	14
	60+	09-10	.571	0.092	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.6, 0.6, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',4,4',5-Pentabromodiphenyl ether (BDE 99) (lipid adjusted) (2003 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	03-04	*	< LOD	9.20 (7.50-11.1)	21.7 (17.0-29.1)	42.2 (33.3-54.8)	1985
Age group							
12-19 years	03-04	6.88 (6.14-7.72)	5.70 (<LOD-7.70)	12.9 (11.4-15.7)	27.9 (19.6-37.9)	45.2 (35.9-56.8)	602
20 years and older	03-04	*	< LOD	8.50 (7.10-10.5)	20.6 (15.5-28.8)	41.6 (30.8-57.3)	1383
Gender							
Males	03-04	5.28 (<LOD-6.14)	< LOD	10.0 (8.40-11.6)	24.5 (18.0-37.3)	45.5 (33.8-57.3)	964
Females	03-04	*	< LOD	8.70 (6.60-10.6)	18.3 (14.7-28.8)	41.2 (22.9-60.3)	1021
Race/ethnicity							
Mexican Americans	03-04	5.90 (5.45-6.39)	5.50 (<LOD-5.80)	10.8 (9.30-12.6)	20.0 (17.0-23.5)	30.8 (24.5-41.7)	478
Non-Hispanic blacks	03-04	6.22 (5.42-7.12)	5.00 (<LOD-5.70)	11.5 (9.60-13.1)	30.2 (21.5-42.2)	74.7 (30.2-155)	479
Non-Hispanic whites	03-04	*	< LOD	8.90 (6.80-11.3)	21.7 (15.3-34.0)	43.6 (30.7-71.4)	903

Limit of detection (LOD, see Data Analysis section) for Survey year 03-04 is 5.0.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',4,4',5-Pentabromodiphenyl ether (BDE 99) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	**14.6	4.7	9
		07-08	6.80	1.22	6
		09-10	**11.8	5.1	10
	20-39	05-06	**10.3	3.6	12
		07-08	5.38	0.78	15
		09-10	5.13	1.02	17
	40-59	05-06	4.45	0.74	12
		07-08	**9.95	3.12	16
		09-10	4.56	1.02	17
60+	05-06	15.4	4.3	15	
	07-08	9.80	2.13	23	
	09-10	5.22	1.24	21	
Non-Hispanic White Female	12-19	05-06	17.5	4.8	10
		07-08	8.10	2.09	7
		09-10	4.95	0.84	8
	20-39	05-06	**13.4	5	16
		07-08	7.72	2.02	13
		09-10	2.74	0.48	19
	40-59	05-06	4.16	0.79	13
		07-08	4.40	0.82	17
		09-10	3.25	0.42	17
60+	05-06	**12.3	4.4	17	
	07-08	8.00	1.79	21	
	09-10	6.60	1.33	22	
Non-Hispanic Black Male	12-19	05-06	12.6	1.4	13
		07-08	7.39	1.79	6
		09-10	4.38	0.94	6
	20-39	05-06	**16.5	6.2	6
		07-08	6.25	0.82	6
		09-10	4.28	0.78	7
	40-59	05-06	5.66	1.1	5
		07-08	7.22	1.5	6
		09-10	**18.3	10.8	7
60+	05-06	**19.5	10.2	5	
	07-08	8.27	1.74	8	
	09-10	**21.6	9.4	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.2, 0.6, and 0.56, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',4,4',5-Pentabromodiphenyl ether (BDE 99) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	23.3	4.8	14
		07-08	**17.6	8.3	5
		09-10	9.84	1.81	6
	20-39	05-06	**17.5	7.8	7
		07-08	7.19	1.14	8
		09-10	8.51	0.96	7
	40-59	05-06	**16.1	8.9	7
		07-08	4.30	0.6	8
		09-10	4.18	1.1	7
	60+	05-06	11.2	3.1	5
07-08		**11.3	4	7	
09-10		5.92	1.34	7	
Mexican American Male	12-19	05-06	9.27	0.91	11
		07-08	10.7	2.5	6
		09-10	8.21	1.28	8
	20-39	05-06	8.47	1	9
		07-08	7.77	1.66	9
		09-10	5.66	0.66	8
	40-59	05-06	9.14	0.97	4
		07-08	6.94	1.71	6
		09-10	5.98	1.19	8
	60+	05-06	7.52	1.13	4
07-08		8.39	1.47	5	
09-10		6.99	1.39	5	
Mexican American Female	12-19	05-06	10.7	1.3	16
		07-08	7.04	0.95	5
		09-10	7.91	1.43	7
	20-39	05-06	6.51	0.65	9
		07-08	**6.44	1.97	8
		09-10	4.74	0.64	10
	40-59	05-06	**6.30	2.32	6
		07-08	4.47	0.66	6
		09-10	6.48	1.14	9
	60+	05-06	13.0	3.7	3
07-08		9.24	1.82	5	
09-10		6.99	1.41	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.2, 0.6, and 0.56, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',4,4',5-Pentabromodiphenyl ether (BDE 99) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	7.16	1.08	11
	20-39	09-10	5.92	0.57	13
	40-59	09-10	6.42	1.02	13
	60+	09-10	5.81	1.12	8
All Hispanic Female	12-19	09-10	8.98	1.38	10
	20-39	09-10	4.88	0.6	14
	40-59	09-10	5.77	0.83	14
	60+	09-10	5.98	0.96	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.2, 0.6, and 0.56, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',4,4',6-Pentabromodiphenyl ether (BDE 100) (lipid adjusted) (2003 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	03-04	3.93 (3.42-4.51)	3.60 (3.10-4.10)	7.80 (6.80-9.00)	18.4 (15.4-22.0)	36.5 (24.6-54.0)	2040
Age group							
12-19 years	03-04	5.17 (4.46-6.00)	4.90 (3.80-6.10)	9.50 (7.90-12.8)	19.3 (14.4-26.2)	34.3 (25.2-45.0)	622
20 years and older	03-04	3.77 (3.24-4.38)	3.30 (2.90-4.00)	7.40 (6.20-9.00)	18.3 (15.0-22.2)	36.6 (23.2-59.2)	1418
Gender							
Males	03-04	4.16 (3.55-4.86)	3.80 (3.10-4.50)	8.50 (7.50-9.90)	18.5 (14.9-25.1)	44.1 (21.9-61.5)	994
Females	03-04	3.72 (3.15-4.40)	3.30 (2.80-4.10)	7.10 (6.00-8.00)	18.4 (14.4-23.1)	33.3 (23.3-46.0)	1046
Race/ethnicity							
Mexican Americans	03-04	4.58 (4.03-5.22)	4.30 (3.80-5.20)	8.10 (6.80-9.10)	14.9 (11.4-20.3)	26.7 (20.3-36.2)	488
Non-Hispanic blacks	03-04	4.72 (4.01-5.55)	4.30 (3.30-5.20)	9.50 (7.80-10.9)	24.1 (16.6-34.3)	41.3 (26.0-79.2)	503
Non-Hispanic whites	03-04	3.78 (3.17-4.51)	3.30 (2.90-4.10)	7.70 (6.20-9.70)	18.6 (14.5-23.3)	40.5 (22.6-59.2)	921

Limit of detection (LOD, see Data Analysis section) for Survey year 03-04 is 1.4.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',4,4',6-Pentabromodiphenyl ether (BDE 100) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	**13.1	4.2	9
		07-08	5.68	0.92	6
		09-10	**8.17	2.49	10
	20-39	05-06	**8.98	2.81	12
		07-08	7.65	1.18	15
		09-10	5.37	0.8	17
	40-59	05-06	4.07	0.61	12
		07-08	9.00	2.08	16
		09-10	4.66	0.97	17
60+	05-06	14.2	2.6	15	
	07-08	7.76	1.41	23	
	09-10	4.63	0.76	21	
Non-Hispanic White Female	12-19	05-06	10.8	1.9	10
		07-08	5.98	0.69	7
		09-10	4.31	0.34	8
	20-39	05-06	9.89	2.83	16
		07-08	6.11	1.05	13
		09-10	3.52	0.44	19
	40-59	05-06	4.06	0.66	13
		07-08	4.12	0.55	17
		09-10	4.46	1.15	17
60+	05-06	**12.8	5.3	17	
	07-08	8.12	1.66	21	
	09-10	7.17	1.35	22	
Non-Hispanic Black Male	12-19	05-06	10.8	1	13
		07-08	6.45	0.92	6
		09-10	4.69	1.19	6
	20-39	05-06	9.11	2.32	6
		07-08	7.18	1.05	6
		09-10	3.93	0.6	7
	40-59	05-06	7.19	1.91	5
		07-08	7.41	0.94	6
		09-10	12.5	3.4	7
60+	05-06	12.1	2.6	5	
	07-08	6.56	0.9	8	
	09-10	11.4	2.8	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.6, 0.6, and 0.44, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',4,4',6-Pentabromodiphenyl ether (BDE 100) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	14.2	2.8	14
		07-08	**10.2	3.6	5
		09-10	8.70	1.56	6
	20-39	05-06	**11.7	4.5	7
		07-08	7.39	1.17	8
		09-10	7.49	0.98	7
	40-59	05-06	**10.4	5	7
		07-08	4.37	0.48	8
		09-10	4.39	0.99	7
	60+	05-06	8.03	2.35	5
07-08		8.54	2.26	7	
09-10		5.70	1.01	7	
Mexican American Male	12-19	05-06	8.93	1.09	11
		07-08	11.0	2.6	6
		09-10	7.19	0.77	8
	20-39	05-06	8.90	1.44	9
		07-08	7.71	1.43	9
		09-10	6.01	0.83	8
	40-59	05-06	7.89	1.25	4
		07-08	8.15	1.99	6
		09-10	5.55	0.8	8
	60+	05-06	6.74	0.97	4
07-08		**9.53	3.21	5	
09-10		7.70	1.84	5	
Mexican American Female	12-19	05-06	9.45	1.14	16
		07-08	6.40	1.09	5
		09-10	7.20	0.83	7
	20-39	05-06	5.36	0.72	9
		07-08	7.45	1.76	8
		09-10	5.39	0.9	10
	40-59	05-06	5.98	1.15	6
		07-08	4.87	0.76	6
		09-10	6.46	0.86	9
	60+	05-06	10.2	2.3	3
07-08		7.86	1.53	5	
09-10		6.30	0.81	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.6, 0.6, and 0.44, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',4,4',6-Pentabromodiphenyl ether (BDE 100) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	6.44	0.69	11
	20-39	09-10	5.74	0.61	13
	40-59	09-10	5.96	0.87	13
	60+	09-10	6.25	1.34	8
All Hispanic Female	12-19	09-10	7.58	0.79	10
	20-39	09-10	4.85	0.67	14
	40-59	09-10	5.88	0.72	14
	60+	09-10	5.52	0.74	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.6, 0.6, and 0.44, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',4,4',5,5'-Hexabromodiphenyl ether (BDE 153) (lipid adjusted) (2003 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	03-04	5.69 (5.11-6.34)	4.80 (4.20-5.30)	11.3 (9.90-12.8)	32.6 (27.9-40.3)	65.7 (54.9-88.4)	2039
Age group							
12-19 years	03-04	8.05 (6.68-9.70)	7.50 (6.10-9.90)	15.3 (11.7-19.4)	31.0 (22.9-44.2)	52.9 (35.9-68.5)	621
20 years and older	03-04	5.41 (4.83-6.05)	4.40 (3.80-5.10)	10.6 (9.00-12.3)	32.8 (26.5-45.9)	73.3 (58.2-90.4)	1418
Gender							
Males	03-04	6.85 (5.99-7.84)	5.50 (4.80-6.70)	12.7 (11.2-16.5)	49.3 (31.0-62.9)	88.4 (63.4-115)	994
Females	03-04	4.78 (4.20-5.43)	4.10 (3.40-5.00)	9.70 (7.40-11.9)	26.0 (20.2-31.6)	54.5 (34.6-62.9)	1045
Race/ethnicity							
Mexican Americans	03-04	5.11 (4.32-6.06)	4.80 (4.20-5.40)	8.70 (6.50-11.0)	17.2 (13.0-25.3)	34.0 (18.3-55.1)	487
Non-Hispanic blacks	03-04	6.05 (5.35-6.83)	5.50 (4.80-6.20)	12.9 (9.90-17.5)	30.0 (21.0-44.2)	53.1 (36.8-63.3)	503
Non-Hispanic whites	03-04	5.85 (5.03-6.81)	4.90 (3.90-5.70)	11.9 (9.90-15.2)	39.0 (28.5-54.9)	75.9 (58.0-93.2)	921

Limit of detection (LOD, see Data Analysis section) for Survey year 03-04 is 2.2.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',4,4',5,5'-Hexabromodiphenyl ether (BDE 153) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	18.0	4.4	9
		07-08	13.8	2.3	6
		09-10	13.8	2	10
	20-39	05-06	15.4	3.7	12
		07-08	20.9	3.1	15
		09-10	13.0	1.4	17
	40-59	05-06	7.53	1.04	12
		07-08	16.0	3.1	16
		09-10	16.5	3	17
60+	05-06	19.7	4.7	15	
	07-08	14.7	3.8	23	
	09-10	10.8	1.9	21	
Non-Hispanic White Female	12-19	05-06	12.8	2.2	10
		07-08	8.84	0.94	7
		09-10	8.53	0.94	8
	20-39	05-06	11.1	1.9	16
		07-08	11.8	1.7	13
		09-10	13.2	3	19
	40-59	05-06	10.4	2.3	13
		07-08	9.89	1.77	17
		09-10	12.5	3.1	17
60+	05-06	**9.64	2.9	17	
	07-08	13.2	2.5	21	
	09-10	11.7	2.3	22	
Non-Hispanic Black Male	12-19	05-06	16.5	1.5	13
		07-08	20.7	3.9	6
		09-10	13.3	2.6	6
	20-39	05-06	10.3	1.6	6
		07-08	13.4	2.8	6
		09-10	**21.7	8.3	7
	40-59	05-06	13.4	3.6	5
		07-08	10.2	1.1	6
		09-10	13.5	2.6	7
60+	05-06	14.7	1.6	5	
	07-08	10.6	1.8	8	
	09-10	**14.8	5.1	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.6, 0.6, and 0.6, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',4,4',5,5'-Hexabromodiphenyl ether (BDE 153) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	12.1	1.5	14
		07-08	11.1	2	5
		09-10	12.8	2.7	6
	20-39	05-06	9.55	1.69	7
		07-08	11.0	1.7	8
		09-10	10.1	2.8	7
	40-59	05-06	7.41	2.22	7
		07-08	6.28	1.03	8
		09-10	4.46	0.65	7
	60+	05-06	**6.89	2.52	5
07-08		7.91	2.1	7	
09-10		7.22	1.1	7	
Mexican American Male	12-19	05-06	11.0	1	11
		07-08	17.2	5	6
		09-10	11.0	1.1	8
	20-39	05-06	11.9	2.6	9
		07-08	10.7	2.1	9
		09-10	10.2	2.5	8
	40-59	05-06	**11.3	3.7	4
		07-08	11.9	2.4	6
		09-10	15.9	4.5	8
	60+	05-06	8.00	1.44	4
07-08		17.6	4.5	5	
09-10		10.3	2.3	5	
Mexican American Female	12-19	05-06	10.5	1.4	16
		07-08	7.14	0.72	5
		09-10	8.58	1.78	7
	20-39	05-06	6.73	1.42	9
		07-08	11.1	2.3	8
		09-10	7.75	1.4	10
	40-59	05-06	9.24	2.16	6
		07-08	6.55	1.61	6
		09-10	10.3	1.5	9
	60+	05-06	11.0	1.8	3
07-08		**10.2	3.7	5	
09-10		9.72	1.92	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.6, 0.6, and 0.6, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',4,4',5,5'-Hexabromodiphenyl ether (BDE 153) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	10.9	1	11
	20-39	09-10	9.04	1.6	13
	40-59	09-10	14.9	2.9	13
	60+	09-10	9.73	1.5	8
All Hispanic Female	12-19	09-10	8.80	1.34	10
	20-39	09-10	7.37	1.02	14
	40-59	09-10	8.98	1.14	14
	60+	09-10	7.97	1.23	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.6, 0.6, and 0.6, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',4,4',5,6'-Hexabromodiphenyl ether (BDE 154) (lipid adjusted) (2003 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	03-04	*	< LOD	.900 (.800-1.10)	2.10 (1.70-2.70)	4.20 (2.80-5.40)	2014
Age group							
12-19 years	03-04	*	< LOD	1.20 (1.00-1.40)	2.70 (2.00-3.00)	4.00 (3.00-4.80)	614
20 years and older	03-04	*	< LOD	.900 (.800-1.10)	2.00 (1.60-2.60)	4.20 (2.70-5.70)	1400
Gender							
Males	03-04	*	< LOD	1.00 (.800-1.20)	2.30 (1.80-3.00)	4.30 (3.20-6.50)	976
Females	03-04	*	< LOD	.900 (.800-1.00)	1.80 (1.40-2.80)	4.20 (2.50-5.70)	1038
Race/ethnicity							
Mexican Americans	03-04	*	< LOD	1.00 (.900-1.10)	1.80 (1.40-2.30)	3.90 (2.30-4.50)	477
Non-Hispanic blacks	03-04	*	< LOD	1.20 (.900-1.40)	2.70 (2.30-4.40)	5.30 (3.10-8.70)	498
Non-Hispanic whites	03-04	*	< LOD	.900 (.800-1.10)	2.00 (1.50-2.80)	4.20 (2.50-6.70)	913

Limit of detection (LOD, see Data Analysis section) for Survey year 03-04 is 0.8.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',4,4',5,6'-Hexabromodiphenyl ether (BDE 154) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	**1.30	0.45	9
		07-08	*	*	6
		09-10	** .798	0.297	10
	20-39	05-06	.802	0.237	12
		07-08	.686	0.089	15
		09-10	*	*	15
	40-59	05-06	*	*	12
		07-08	.974	0.279	16
		09-10	*	*	17
60+	05-06	1.36	0.28	15	
	07-08	.833	0.152	23	
	09-10	*	*	21	
Non-Hispanic White Female	12-19	05-06	1.23	0.3	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	*	*	16
		07-08	*	*	13
		09-10	*	*	19
	40-59	05-06	*	*	13
		07-08	*	*	17
		09-10	*	*	17
	60+	05-06	**1.30	0.53	17
		07-08	.753	0.141	21
		09-10	.619	0.114	22
Non-Hispanic Black Male	12-19	05-06	1.20	0.16	13
		07-08	.712	0.108	6
		09-10	*	*	6
	20-39	05-06	**1.24	0.42	6
		07-08	.637	0.083	6
		09-10	*	*	7
	40-59	05-06	.623	0.16	5
		07-08	.733	0.099	6
		09-10	**1.43	0.69	7
	60+	05-06	1.40	0.38	5
		07-08	.693	0.103	8
		09-10	**1.38	0.5	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.6, 0.6, and 0.58, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',4,4',5,6'-Hexabromodiphenyl ether (BDE 154) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	1.73	0.39	14
		07-08	**1.25	0.46	5
		09-10	.972	0.24	6
	20-39	05-06	**1.32	0.55	7
		07-08	.704	0.088	8
		09-10	.656	0.042	7
	40-59	05-06	**1.26	0.66	7
		07-08	*	*	8
		09-10	*	*	7
	60+	05-06	**1.11	0.46	5
		07-08	**1.940	0.329	7
		09-10	*	*	7
Mexican American Male	12-19	05-06	.902	0.091	11
		07-08	.973	0.224	6
		09-10	.638	0.085	8
	20-39	05-06	.827	0.103	9
		07-08	.789	0.148	9
		09-10	*	*	8
	40-59	05-06	.870	0.104	4
		07-08	.732	0.19	6
		09-10	**1.784	0.308	8
	60+	05-06	.657	0.135	4
		07-08	.797	0.177	5
		09-10	.733	0.203	5
Mexican American Female	12-19	05-06	.965	0.106	16
		07-08	.649	0.13	5
		09-10	.658	0.108	7
	20-39	05-06	.609	0.061	9
		07-08	.671	0.177	8
		09-10	*	*	10
	40-59	05-06	**1.710	0.295	6
		07-08	*	*	6
		09-10	.613	0.099	9
	60+	05-06	1.09	0.25	3
		07-08	.898	0.201	5
		09-10	.619	0.091	6

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.6, 0.6, and 0.58, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',4,4',5,6'-Hexabromodiphenyl ether (BDE 154) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	*	*	13
	40-59	09-10	.701	0.196	13
	60+	09-10	*	*	8
All Hispanic Female	12-19	09-10	.750	0.11	10
	20-39	09-10	*	*	14
	40-59	09-10	*	*	14
	60+	09-10	*	*	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.6, 0.6, and 0.58, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',3,4,4',5',6-Heptabromodiphenyl ether (BDE 183) (lipid adjusted) (2003 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	03-04	*	< LOD	< LOD	< LOD	< LOD	1993
Age group							
12-19 years	03-04	*	< LOD	< LOD	< LOD	< LOD	604
20 years and older	03-04	*	< LOD	< LOD	< LOD	< LOD	1389
Gender							
Males	03-04	*	< LOD	< LOD	< LOD	1.70 (<LOD-2.60)	962
Females	03-04	*	< LOD	< LOD	< LOD	< LOD	1031
Race/ethnicity							
Mexican Americans	03-04	*	< LOD	< LOD	< LOD	< LOD	484
Non-Hispanic blacks	03-04	*	< LOD	< LOD	< LOD	1.80 (<LOD-2.70)	482
Non-Hispanic whites	03-04	*	< LOD	< LOD	< LOD	< LOD	901

Limit of detection (LOD, see Data Analysis section) for Survey year 03-04 is 1.7.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',3,4,4',5',6-Heptabromodiphenyl ether (BDE 183) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	*	*	12
		07-08	*	*	15
		09-10	*	*	17
	40-59	05-06	*	*	12
		07-08	** .694	0.238	16
		09-10	*	*	17
60+	05-06	*	*	15	
	07-08	*	*	23	
	09-10	*	*	21	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	*	*	16
		07-08	*	*	13
		09-10	*	*	19
	40-59	05-06	*	*	13
		07-08	*	*	17
		09-10	*	*	17
60+	05-06	*	*	17	
	07-08	*	*	21	
	09-10	*	*	22	
Non-Hispanic Black Male	12-19	05-06	.611	0.077	13
		07-08	*	*	6
		09-10	*	*	6
	20-39	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	.693	0.188	5
		07-08	.733	0.087	6
		09-10	.572	0.093	7
60+	05-06	*	*	5	
	07-08	*	*	8	
	09-10	*	*	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.6, 0.6, and 0.49, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',3,4,4',5',6-Heptabromodiphenyl ether (BDE 183) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
60+	05-06	*	*	5	
	07-08	*	*	7	
	09-10	*	*	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	*	*	9
		07-08	*	*	9
		09-10	*	*	8
	40-59	05-06	*	*	4
		07-08	*	*	6
		09-10	*	*	8
60+	05-06	*	*	4	
	07-08	*	*	5	
	09-10	** .508	0.171	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	8
		09-10	*	*	10
	40-59	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	9
60+	05-06	*	*	3	
	07-08	*	*	5	
	09-10	*	*	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.6, 0.6, and 0.49, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',3,4,4',5',6-Heptabromodiphenyl ether (BDE 183) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	*	*	13
	40-59	09-10	*	*	13
	60+	09-10	*	*	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	*	*	14
	60+	09-10	*	*	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.6, 0.6, and 0.49, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',3,3',4,4',5,5',6,6'-Decabromodiphenyl ether (BDE 209) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	**6.31	1.92	10
	20-39	05-06	*	*	12
		07-08	*	*	15
		09-10	2.63	0.4	17
	40-59	05-06	*	*	12
		07-08	*	*	16
		09-10	**6.36	3.89	17
60+	05-06	*	*	15	
	07-08	*	*	23	
	09-10	3.58	0.8	21	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	*	*	16
		07-08	*	*	13
		09-10	2.27	0.48	18
	40-59	05-06	*	*	13
		07-08	*	*	17
		09-10	*	*	17
60+	05-06	*	*	17	
	07-08	*	*	21	
	09-10	**8.64	5.4	22	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	3.07	0.47	6
	20-39	05-06	*	*	6
		07-08	*	*	6
		09-10	**8.38	3.46	7
	40-59	05-06	*	*	5
		07-08	*	*	6
		09-10	3.47	0.42	7
60+	05-06	*	*	5	
	07-08	*	*	8	
	09-10	3.59	0.73	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 6.0, 5.8, and 2.19, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',3,3',4,4',5,5',6,6'-Decabromodiphenyl ether (BDE 209) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	*	*	7
		07-08	*	*	8
		09-10	2.22	0.18	7
	40-59	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
	60+	05-06	*	*	5
07-08		*	*	7	
09-10		2.94	0.17	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	2.37	0.27	8
	20-39	05-06	*	*	9
		07-08	*	*	9
		09-10	2.77	0.28	8
	40-59	05-06	*	*	4
		07-08	*	*	6
		09-10	3.62	0.5	8
	60+	05-06	*	*	4
07-08		*	*	5	
09-10		2.37	0.27	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	**2.67	0.84	7
	20-39	05-06	*	*	9
		07-08	*	*	8
		09-10	3.25	0.44	10
	40-59	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	9
	60+	05-06	*	*	3
07-08		*	*	5	
09-10		3.80	0.45	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 6.0, 5.8, and 2.19, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',3,3',4,4',5,5',6,6'-Decabromodiphenyl ether (BDE 209) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	2.55	0.22	11
	20-39	09-10	2.91	0.23	13
	40-59	09-10	4.02	0.45	13
	60+	09-10	2.52	0.34	8
All Hispanic Female	12-19	09-10	3.06	0.67	10
	20-39	09-10	3.29	0.43	14
	40-59	09-10	**2.81	0.85	14
	60+	09-10	3.75	0.47	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 6.0, 5.8, and 2.19, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',4,4',5,5'-Hexabromobiphenyl (PBB 153) (lipid adjusted) (2003 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	03-04	2.29 (1.82-2.87)	2.20 (2.00-2.60)	4.40 (3.40-6.30)	12.8 (6.60-25.5)	27.2 (11.7-60.9)	2032
Age group							
12-19 years	03-04	*	< LOD	1.10 (.900-1.60)	2.70 (2.00-3.00)	4.10 (2.90-4.70)	616
20 years and older	03-04	2.72 (2.14-3.47)	2.50 (2.20-2.80)	4.90 (3.60-7.90)	13.6 (7.20-34.6)	34.6 (12.8-66.8)	1416
Gender							
Males	03-04	2.76 (2.21-3.45)	2.70 (2.30-3.20)	5.40 (3.90-8.50)	15.8 (9.30-27.8)	35.4 (13.5-70.3)	987
Females	03-04	1.92 (1.50-2.46)	2.00 (1.60-2.30)	3.60 (2.80-4.90)	9.70 (4.60-27.5)	23.9 (7.40-56.6)	1045
Race/ethnicity							
Mexican Americans	03-04	1.11 (.917-1.33)	1.10 (<LOD-1.30)	2.60 (2.00-3.00)	6.00 (3.50-8.60)	10.0 (6.50-15.2)	484
Non-Hispanic blacks	03-04	2.35 (1.64-3.37)	2.10 (1.70-2.80)	4.80 (3.00-12.1)	13.9 (7.00-38.2)	29.7 (12.1-70.2)	503
Non-Hispanic whites	03-04	2.66 (2.06-3.42)	2.50 (2.20-2.80)	4.90 (3.40-7.80)	13.5 (6.60-36.4)	34.6 (11.6-70.3)	917

Limit of detection (LOD, see Data Analysis section) for Survey year 03-04 is 0.8.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',4,4',5,5'-Hexabromobiphenyl (PBB 153) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	**1.90	1.09	9
		07-08	.824	0.161	6
		09-10	*	*	10
	20-39	05-06	**6.86	3.02	12
		07-08	**3.58	1.27	15
		09-10	2.75	0.57	17
	40-59	05-06	**16.8	11.2	12
		07-08	8.92	1.44	16
		09-10	**9.87	3.19	17
60+	05-06	8.95	2.02	15	
	07-08	6.84	0.74	23	
	09-10	9.28	1.76	21	
Non-Hispanic White Female	12-19	05-06	.826	0.18	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	2.63	0.45	16
		07-08	1.81	0.34	13
		09-10	**1.69	0.52	18
	40-59	05-06	**9.35	3.65	13
		07-08	4.63	1.07	17
		09-10	3.40	0.37	17
60+	05-06	8.83	1.74	17	
	07-08	6.74	1.65	21	
	09-10	8.50	1.91	22	
Non-Hispanic Black Male	12-19	05-06	1.13	0.18	13
		07-08	.689	0.111	6
		09-10	*	*	6
	20-39	05-06	**4.08	2.26	6
		07-08	2.10	0.56	6
		09-10	1.46	0.23	7
	40-59	05-06	**17.1	8.8	5
		07-08	**14.5	6.6	6
		09-10	4.59	0.67	7
60+	05-06	8.56	1.13	5	
	07-08	7.25	1.17	8	
	09-10	6.51	0.73	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.6, 0.6, and 0.92, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',4,4',5,5'-Hexabromobiphenyl (PBB 153) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	2.38	0.55	7
		07-08	**3.36	1.64	8
		09-10	*	*	7
	40-59	05-06	**4.26	1.69	7
		07-08	6.31	1.13	8
		09-10	**4.18	1.77	7
	60+	05-06	**6.84	2.86	5
07-08		8.01	1.65	7	
09-10		4.88	1.46	7	
Mexican American Male	12-19	05-06	.601	0.074	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	1.69	0.44	9
		07-08	.962	0.178	9
		09-10	*	*	8
	40-59	05-06	4.29	1.26	4
		07-08	**22.7	20.5	6
		09-10	4.74	1.14	8
	60+	05-06	**19.7	9.8	4
07-08		**14.0	8.8	5	
09-10		4.69	0.94	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	**2.53	1.14	9
		07-08	**1.30	0.45	8
		09-10	.941	0.266	10
	40-59	05-06	2.12	0.4	6
		07-08	1.64	0.35	6
		09-10	2.26	0.36	9
	60+	05-06	**4.16	1.3	3
07-08		**4.28	1.44	5	
09-10		3.29	0.55	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.6, 0.6, and 0.92, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 2,2',4,4',5,5'-Hexabromobiphenyl (PBB 153) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	1.03	0.12	13
	40-59	09-10	4.29	0.73	13
	60+	09-10	4.53	0.66	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	2.17	0.25	14
	60+	09-10	3.52	0.37	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.6, 0.6, and 0.92, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/PBDEs_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html

Serum 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	58.2 (<LOD-63.6)	86.0 (75.5-96.7)	112 (101-131)	1894
	01-02	39.0 (33.7-45.0)	40.2 (34.9-46.9)	68.7 (56.7-82.2)	115 (88.2-138)	147 (126-181)	1220
	03-04	25.3 (23.4-27.3)	24.9 (22.8-26.9)	42.5 (38.8-48.1)	70.4 (62.7-80.1)	91.3 (73.5-117)	1874
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	63.6 (<LOD-75.6)	657
	01-02	†	†	†	†	†	†
	03-04	16.7 (15.1-18.4)	16.4 (15.1-18.3)	23.6 (21.5-25.8)	33.4 (28.6-36.8)	46.7 (34.5-78.1)	586
20 years and older	99-00	*	< LOD	62.0 (57.1-66.7)	92.9 (81.2-101)	120 (102-139)	1237
	01-02	39.0 (33.7-45.0)	40.2 (34.9-46.9)	68.7 (56.7-82.2)	115 (88.2-138)	147 (126-181)	1220
	03-04	26.8 (24.6-29.2)	27.3 (24.6-29.0)	45.6 (41.3-53.2)	73.7 (64.1-88.6)	95.0 (76.1-126)	1288
Gender Males	99-00	*	< LOD	< LOD	73.6 (69.0-80.8)	94.7 (83.1-103)	910
	01-02	36.6 (31.7-42.3)	39.0 (33.3-42.6)	62.1 (49.7-75.0)	102 (75.8-132)	138 (103-169)	553
	03-04	24.2 (21.7-27.0)	23.2 (21.1-25.6)	40.6 (35.3-46.9)	64.2 (58.8-73.7)	85.0 (65.8-113)	920
Females	99-00	*	< LOD	62.7 (<LOD-69.1)	102 (86.0-118)	131 (111-164)	984
	01-02	41.2 (34.9-48.7)	43.6 (35.3-52.4)	76.0 (59.5-90.1)	125 (93.4-150)	158 (130-191)	667
	03-04	26.3 (24.4-28.3)	26.8 (24.3-28.3)	44.4 (41.1-50.2)	76.1 (65.3-89.1)	95.7 (80.7-128)	954
Race/ethnicity Mexican Americans	99-00	*	< LOD	61.4 (<LOD-69.0)	97.7 (82.8-111)	132 (108-159)	621
	01-02	39.6 (35.7-43.9)	39.7 (33.6-47.4)	64.0 (55.8-74.7)	107 (82.4-128)	149 (111-171)	262
	03-04	25.8 (22.6-29.4)	26.1 (20.9-30.9)	41.9 (36.7-44.7)	61.0 (49.7-71.9)	80.1 (65.0-89.1)	424
Non-Hispanic blacks	99-00	*	< LOD	58.1 (<LOD-71.1)	95.0 (75.1-110)	125 (102-183)	408
	01-02	43.7 (35.4-54.0)	42.8 (32.2-59.8)	80.6 (60.9-106)	134 (101-166)	167 (130-230)	218
	03-04	25.8 (22.6-29.4)	23.7 (20.7-27.1)	41.2 (32.6-56.4)	69.2 (54.6-115)	115 (67.1-164)	454
Non-Hispanic whites	99-00	*	< LOD	59.0 (<LOD-64.8)	84.9 (72.0-97.0)	106 (96.7-122)	709
	01-02	39.3 (33.0-46.8)	40.5 (34.0-50.1)	71.0 (56.3-87.5)	117 (87.1-147)	147 (125-186)	657
	03-04	25.0 (22.6-27.7)	24.6 (22.3-27.4)	42.6 (39.4-48.5)	73.5 (60.4-86.7)	93.7 (71.6-127)	875

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 55.9, 10.3, and 13.0, respectively.

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	19.2	1.6	9
		07-08	14.5	0.4	6
		09-10	13.2	0.5	10
	20-39	05-06	19.4	1.4	12
		07-08	16.9	1.6	15
		09-10	17.1	1	17
	40-59	05-06	36.1	4.6	12
		07-08	21.0	1.8	16
		09-10	24.1	2.5	17
60+	05-06	47.8	4.3	15	
	07-08	36.5	2.2	23	
	09-10	30.1	1.6	21	
Non-Hispanic White Female	12-19	05-06	15.0	1	10
		07-08	12.7	1	7
		09-10	9.94	0.9	8
	20-39	05-06	20.5	2.1	16
		07-08	17.3	0.9	13
		09-10	15.1	2.6	18
	40-59	05-06	32.2	2.9	13
		07-08	22.2	1.8	17
		09-10	19.0	0.9	17
60+	05-06	49.8	3	17	
	07-08	41.6	3.9	21	
	09-10	30.8	2.8	14	
Non-Hispanic Black Male	12-19	05-06	17.2	0.7	13
		07-08	11.9	0.9	6
		09-10	8.75	0.59	6
	20-39	05-06	16.1	1	6
		07-08	16.0	1.1	6
		09-10	11.6	1.5	7
	40-59	05-06	23.4	1.6	5
		07-08	20.8	1.5	6
		09-10	17.6	2.6	7
60+	05-06	44.9	5.7	5	
	07-08	28.9	5.1	8	
	09-10	24.4	1.6	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 2.43, 4.22, and 4.5, respectively.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	15.9	1.7	14
		07-08	11.0	1.1	5
		09-10	8.67	0.72	6
	20-39	05-06	20.8	1.6	7
		07-08	19.4	1.7	8
		09-10	13.6	1.9	7
	40-59	05-06	36.3	4.3	7
		07-08	28.1	2.1	8
		09-10	21.9	4.1	7
	60+	05-06	77.4	12.5	5
07-08		55.1	6	7	
09-10		51.0	5.4	7	
Mexican American Male	12-19	05-06	15.3	1.1	11
		07-08	12.8	1.1	6
		09-10	12.5	0.9	8
	20-39	05-06	26.0	2.6	9
		07-08	17.7	1.4	9
		09-10	19.9	2.1	8
	40-59	05-06	34.5	3.6	4
		07-08	29.0	2.2	6
		09-10	29.5	2.2	7
	60+	05-06	40.3	5	4
07-08		27.5	3.8	5	
09-10		46.0	7.2	5	
Mexican American Female	12-19	05-06	13.2	0.7	16
		07-08	10.9	2.3	5
		09-10	7.94	0.68	7
	20-39	05-06	25.1	1.9	9
		07-08	23.0	2.9	8
		09-10	14.0	2.2	10
	40-59	05-06	41.8	4.3	6
		07-08	30.9	3.6	6
		09-10	39.2	4.3	9
	60+	05-06	59.1	6.9	3
07-08		52.8	2.8	5	
09-10		68.0	7.7	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 2.43, 4.22, and 4.5, respectively.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	12.4	0.8	11
	20-39	09-10	16.9	1.9	13
	40-59	09-10	24.0	2.3	12
	60+	09-10	37.4	6.3	8
All Hispanic Female	12-19	09-10	8.23	0.56	10
	20-39	09-10	14.1	1.6	14
	40-59	09-10	33.3	3.6	14
	60+	09-10	53.5	6.9	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 2.43, 4.22, and 4.5, respectively.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	354 (<LOD384)	564 (501-617)	749 (646-869)	1894
	01-02	252 (219-289)	267 (232-305)	440 (376-529)	779 (591-989)	1030 (840-1290)	1220
	03-04	155 (143-167)	150 (134-163)	288 (242-319)	465 (399-550)	618 (516-787)	1874
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	289 (<LOD340)	657
	01-02	†	†	†	†	†	†
	03-04	84.6 (77.4-92.5)	83.9 (76.1-92.0)	118 (106-131)	165 (139-185)	210 (176-319)	586
20 years and older	99-00	*	< LOD	385 (354-418)	610 (534-677)	802 (681-936)	1237
	01-02	252 (219-289)	267 (232-305)	440 (376-529)	779 (591-989)	1030 (840-1290)	1220
	03-04	169 (155-184)	170 (150-186)	314 (267-348)	506 (419-576)	628 (546-810)	1288
Gender Males	99-00	*	< LOD	< LOD	489 (436-543)	613 (535-681)	910
	01-02	243 (211-279)	245 (213-291)	422 (349-527)	766 (536-976)	983 (766-1260)	553
	03-04	150 (135-167)	144 (129-161)	273 (236-305)	424 (365-516)	554 (440-667)	920
Females	99-00	*	< LOD	373 (<LOD428)	637 (562-802)	907 (806-1040)	984
	01-02	260 (221-306)	281 (236-324)	466 (386-551)	795 (621-997)	1140 (849-1330)	667
	03-04	159 (147-172)	158 (138-170)	303 (249-345)	520 (429-591)	623 (545-848)	954
Race/ethnicity Mexican Americans	99-00	*	< LOD	372 (<LOD404)	598 (546-657)	849 (657-1020)	621
	01-02	254 (232-278)	249 (229-286)	403 (360-521)	791 (643-929)	988 (817-1240)	262
	03-04	158 (139-180)	159 (138-193)	274 (241-299)	414 (349-469)	556 (451-592)	424
Non-Hispanic blacks	99-00	*	< LOD	323 (<LOD391)	567 (422-716)	778 (574-1130)	408
	01-02	258 (208-319)	262 (180-339)	478 (343-600)	852 (578-1170)	1170 (821-1660)	218
	03-04	148 (128-170)	137 (117-156)	247 (188-344)	434 (345-599)	715 (405-1090)	454
Non-Hispanic whites	99-00	*	< LOD	370 (<LOD401)	565 (491-634)	733 (637-816)	709
	01-02	255 (216-302)	277 (228-328)	442 (374-547)	782 (551-1020)	1020 (803-1290)	657
	03-04	155 (140-170)	152 (131-171)	292 (248-325)	492 (390-571)	621 (506-810)	875

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	106	10	9
		07-08	72.5	2.5	6
		09-10	70.6	3.5	10
	20-39	05-06	140	12	12
		07-08	111	10	15
		09-10	113	8	17
	40-59	05-06	274	39	12
		07-08	154	12	16
		09-10	162	16	17
60+	05-06	325	28	15	
	07-08	233	13	23	
	09-10	182	8	21	
Non-Hispanic White Female	12-19	05-06	79.4	5	10
		07-08	59.1	3.8	7
		09-10	47.5	4.6	8
	20-39	05-06	135	17	16
		07-08	103	6	13
		09-10	80.5	14.4	18
	40-59	05-06	237	23	13
		07-08	146	12	17
		09-10	120	7	17
	60+	05-06	365	24	17
		07-08	279	27	21
		09-10	190	15	14
Non-Hispanic Black Male	12-19	05-06	86.6	3.3	13
		07-08	56.1	3.8	6
		09-10	40.1	3.5	6
	20-39	05-06	95.6	7.3	6
		07-08	90.1	7	6
		09-10	64.2	6.9	7
	40-59	05-06	149	12	5
		07-08	133	9	6
		09-10	107	13	7
	60+	05-06	266	30	5
		07-08	174	31	8
		09-10	131	9	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	78.3	7.7	14
		07-08	52.6	6.3	5
		09-10	38.1	2.7	6
	20-39	05-06	120	10	7
		07-08	98.6	9.4	8
		09-10	66.7	9	7
	40-59	05-06	234	31	7
		07-08	169	14	8
		09-10	124	23	7
	60+	05-06	522	90	5
07-08		329	29	7	
09-10		290	27	7	
Mexican American Male	12-19	05-06	82.5	5.3	11
		07-08	67.4	4.5	6
		09-10	59.1	5	8
	20-39	05-06	184	16	9
		07-08	123	15	9
		09-10	121	14	8
	40-59	05-06	284	41	4
		07-08	207	19	6
		09-10	207	13	7
	60+	05-06	286	26	4
07-08		207	44	5	
09-10		282	44	5	
Mexican American Female	12-19	05-06	72.1	4.2	16
		07-08	52.9	10.5	5
		09-10	37.0	2.9	7
	20-39	05-06	168	15	9
		07-08	133	17	8
		09-10	75.9	12.5	10
	40-59	05-06	311	37	6
		07-08	210	28	6
		09-10	245	21	9
	60+	05-06	458	88	3
07-08		363	25	5	
09-10		376	37	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	58.2	4.4	11
	20-39	09-10	108	14	13
	40-59	09-10	166	16	12
	60+	09-10	236	38	8
All Hispanic Female	12-19	09-10	38.1	2.5	10
	20-39	09-10	77.4	9	14
	40-59	09-10	206	20	14
	60+	09-10	310	33	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD) (lipid adjusted) (2001 – 2004)

Geometric mean and selected percentiles of serum concentrations (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	01-02	*	< LOD	< LOD	10.7 (<LOD-13.9)	14.9 (11.7-20.0)	1239
	03-04	*	< LOD	< LOD	< LOD	< LOD	1861
Age group							
12-19 years	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	< LOD	< LOD	582
20 years and older	01-02	*	< LOD	< LOD	10.7 (<LOD-13.9)	14.9 (11.7-20.0)	1239
	03-04	*	< LOD	< LOD	< LOD	< LOD	1279
Gender							
Males	01-02	*	< LOD	< LOD	10.9 (<LOD-14.3)	14.7 (11.5-17.6)	566
	03-04	*	< LOD	< LOD	< LOD	< LOD	914
Females	01-02	*	< LOD	< LOD	10.7 (<LOD-14.1)	15.6 (11.1-23.0)	673
	03-04	*	< LOD	< LOD	< LOD	< LOD	947
Race/ethnicity							
Mexican Americans	01-02	*	< LOD	< LOD	< LOD	9.20 (<LOD-11.8)	263
	03-04	*	< LOD	< LOD	< LOD	< LOD	421
Non-Hispanic blacks	01-02	*	< LOD	< LOD	13.9 (<LOD-17.6)	18.3 (13.9-23.0)	220
	03-04	*	< LOD	< LOD	< LOD	< LOD	450
Non-Hispanic whites	01-02	*	< LOD	< LOD	11.3 (<LOD-14.4)	15.1 (12.0-20.5)	672
	03-04	*	< LOD	< LOD	< LOD	< LOD	870

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02 and 03-04 are 9.0 and 11.9.

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	1.11	0.25	6
		09-10	1.08	0.06	10
	20-39	05-06	1.44	0.35	12
		07-08	1.38	0.25	15
		09-10	1.79	0.1	17
	40-59	05-06	4.47	0.42	12
		07-08	2.95	0.17	16
		09-10	2.84	0.2	17
60+	05-06	7.15	0.76	15	
	07-08	5.65	0.49	23	
	09-10	4.51	0.19	20	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	.767	0.094	8
	20-39	05-06	*	*	16
		07-08	1.10	0.19	13
		09-10	1.19	0.09	18
	40-59	05-06	3.59	0.2	13
		07-08	2.45	0.21	17
		09-10	2.42	0.11	17
60+	05-06	6.40	0.33	17	
	07-08	5.71	0.44	21	
	09-10	4.93	0.38	22	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	.705	0.137	5
	20-39	05-06	1.56	0.33	6
		07-08	**1.06	0.38	6
		09-10	1.17	0.15	7
	40-59	05-06	2.78	0.37	5
		07-08	2.93	0.17	6
		09-10	2.34	0.22	7
60+	05-06	6.65	0.19	5	
	07-08	4.83	0.8	8	
	09-10	3.85	0.34	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.15, 0.26, and 0.28, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	.800	0.097	6
	20-39	05-06	1.87	0.24	7
		07-08	*	*	8
		09-10	1.23	0.13	7
	40-59	05-06	3.83	0.44	7
		07-08	3.34	0.44	8
		09-10	2.49	0.36	7
60+	05-06	12.7	1.7	5	
	07-08	9.88	1.7	7	
	09-10	6.79	0.82	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	1.01	0.1	8
	20-39	05-06	*	*	9
		07-08	1.41	0.2	9
		09-10	1.44	0.17	8
	40-59	05-06	**2.65	0.93	4
		07-08	2.91	0.2	6
		09-10	2.66	0.13	7
60+	05-06	4.96	0.17	4	
	07-08	4.83	0.34	5	
	09-10	5.68	0.82	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	.544	0.043	7
	20-39	05-06	*	*	9
		07-08	1.47	0.27	8
		09-10	.944	0.133	10
	40-59	05-06	3.64	0.8	6
		07-08	3.03	0.47	6
		09-10	2.76	0.18	9
60+	05-06	7.30	0.67	3	
	07-08	6.19	0.72	5	
	09-10	6.95	0.96	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.15, 0.26, and 0.28, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	.954	0.081	11
	20-39	09-10	1.30	0.14	13
	40-59	09-10	2.41	0.15	12
	60+	09-10	4.75	0.68	8
All Hispanic Female	12-19	09-10	.573	0.036	10
	20-39	09-10	.979	0.096	14
	40-59	09-10	2.46	0.19	14
	60+	09-10	5.85	0.71	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.15, 0.26, and 0.28, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD) (whole weight) (2001 – 2004)

Geometric mean and selected percentiles of serum concentrations (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	01-02	*	< LOD	< LOD	74.7 (<LOD-90.7)	105 (81.2-139)	1239
	03-04	*	< LOD	< LOD	< LOD	< LOD	1861
Age group							
12-19 years	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	< LOD	< LOD	582
20 years and older	01-02	*	< LOD	< LOD	74.7 (<LOD-90.7)	105 (81.2-139)	1239
	03-04	*	< LOD	< LOD	< LOD	< LOD	1279
Gender							
Males	01-02	*	< LOD	< LOD	73.6 (<LOD-90.7)	105 (77.9-134)	566
	03-04	*	< LOD	< LOD	< LOD	< LOD	914
Females	01-02	*	< LOD	< LOD	74.7 (<LOD-90.7)	102 (78.0-152)	673
	03-04	*	< LOD	< LOD	< LOD	< LOD	947
Race/ethnicity							
Mexican Americans	01-02	*	< LOD	< LOD	< LOD	71.2 (<LOD-118)	263
	03-04	*	< LOD	< LOD	< LOD	< LOD	421
Non-Hispanic blacks	01-02	*	< LOD	< LOD	82.1 (<LOD-130)	130 (75.7-184)	220
	03-04	*	< LOD	< LOD	< LOD	< LOD	450
Non-Hispanic whites	01-02	*	< LOD	< LOD	77.5 (<LOD-97.1)	105 (78.8-143)	672
	03-04	*	< LOD	< LOD	< LOD	< LOD	870

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	5.49	1.24	6
		09-10	5.72	0.32	10
	20-39	05-06	10.8	2.9	12
		07-08	9.33	1.72	15
		09-10	11.8	0.8	17
	40-59	05-06	33.7	3.5	12
		07-08	21.5	0.9	16
		09-10	19.2	1.4	17
	60+	05-06	48.4	4.7	15
07-08		36.0	2.7	23	
09-10		27.2	0.9	20	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	3.67	0.46	8
	20-39	05-06	*	*	16
		07-08	6.65	1.23	13
		09-10	6.35	0.53	18
	40-59	05-06	26.6	2.2	13
		07-08	16.2	1.4	17
		09-10	15.4	1	17
	60+	05-06	46.7	2.5	17
07-08		38.5	3.2	21	
09-10		29.8	2.1	22	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	3.20	0.64	5
	20-39	05-06	9.31	2.04	6
		07-08	**6.04	2.2	6
		09-10	6.50	0.71	7
	40-59	05-06	17.8	2.4	5
		07-08	18.7	0.9	6
		09-10	14.4	1.4	7
	60+	05-06	40.0	2.1	5
07-08		29.2	5	8	
09-10		20.5	1.7	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	3.52	0.39	6
	20-39	05-06	10.7	1.4	7
		07-08	*	*	8
		09-10	6.07	0.64	7
	40-59	05-06	24.6	3	7
		07-08	20.0	2.8	8
		09-10	14.1	2.1	7
	60+	05-06	83.9	9.4	5
07-08		59.3	10	7	
09-10		38.5	4.1	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	4.74	0.52	8
	20-39	05-06	*	*	9
		07-08	9.33	1.39	9
		09-10	8.95	1.39	8
	40-59	05-06	**21.7	8.3	4
		07-08	20.8	2	6
		09-10	18.8	0.9	7
	60+	05-06	36.0	2.7	4
07-08		35.1	3.8	5	
09-10		34.7	4.9	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	2.54	0.2	7
	20-39	05-06	*	*	9
		07-08	8.36	1.42	8
		09-10	5.10	0.74	10
	40-59	05-06	27.1	5.7	6
		07-08	20.4	3.3	6
		09-10	17.6	1.2	9
	60+	05-06	55.9	8.6	3
07-08		42.7	5.7	5	
09-10		38.2	4.7	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	4.45	0.41	11
	20-39	09-10	8.46	1.21	13
	40-59	09-10	16.7	1.1	12
	60+	09-10	29.7	4	8
All Hispanic Female	12-19	09-10	2.65	0.17	10
	20-39	09-10	5.36	0.54	14
	40-59	09-10	15.4	1.3	14
	60+	09-10	33.9	3.4	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	32.6 (28.3-38.2)	56.9 (47.4-67.3)	74.0 (68.3-82.4)	1885
	01-02	34.6 (29.6-40.6)	39.2 (32.7-44.7)	60.8 (50.3-74.2)	95.2 (76.2-120)	128 (99.4-153)	1234
	03-04	17.2 (15.7-18.9)	20.0 (17.8-22.9)	36.5 (32.2-40.0)	53.0 (48.1-59.6)	68.5 (59.6-74.9)	1871
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	26.7 (20.2-29.6)	648
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	16.1 (14.3-18.1)	19.4 (16.4-27.7)	584
20 years and older	99-00	*	< LOD	36.2 (31.5-40.7)	62.8 (53.6-69.1)	75.6 (70.5-84.2)	1237
	01-02	34.6 (29.6-40.6)	39.2 (32.7-44.7)	60.8 (50.3-74.2)	95.2 (76.2-120)	128 (99.4-153)	1234
	03-04	19.7 (17.8-21.8)	23.8 (20.7-26.4)	39.3 (35.4-42.2)	56.6 (49.7-63.8)	70.8 (60.7-82.2)	1287
Gender Males	99-00	*	< LOD	31.5 (23.7-38.2)	55.0 (45.7-64.2)	71.3 (59.4-79.4)	908
	01-02	34.1 (28.3-41.1)	38.9 (32.1-44.7)	61.9 (50.0-79.5)	94.9 (70.8-131)	130 (88.5-181)	564
	03-04	17.5 (15.5-19.8)	19.8 (17.8-21.6)	35.5 (29.8-40.3)	52.9 (45.4-63.2)	70.2 (57.5-88.7)	920
Females	99-00	*	< LOD	34.9 (29.1-39.7)	61.2 (51.0-69.2)	74.9 (68.4-92.2)	977
	01-02	35.1 (29.9-41.2)	40.1 (32.4-46.3)	59.8 (49.8-72.3)	97.6 (77.1-114)	126 (108-142)	670
	03-04	16.9 (15.3-18.6)	20.5 (17.8-24.6)	36.9 (33.2-41.0)	53.6 (48.3-59.6)	65.6 (60.0-73.4)	951
Race/ethnicity Mexican Americans	99-00	*	< LOD	21.3 (<LOD-27.6)	43.3 (34.1-52.3)	58.0 (49.5-64.8)	624
	01-02	18.3 (15.6-21.4)	21.2 (19.4-25.0)	31.9 (27.5-40.3)	51.5 (40.3-69.9)	68.3 (48.0-111)	260
	03-04	*	< LOD	21.1 (16.3-26.5)	32.2 (24.5-47.4)	43.0 (31.5-65.3)	424
Non-Hispanic blacks	99-00	*	< LOD	31.9 (26.6-41.2)	56.7 (44.9-74.6)	81.6 (72.2-91.7)	402
	01-02	38.9 (33.6-45.0)	40.3 (33.5-47.3)	63.5 (54.6-76.9)	93.9 (78.7-133)	136 (92.6-185)	219
	03-04	16.2 (12.9-20.4)	18.1 (14.4-21.6)	34.9 (28.4-42.9)	54.5 (44.4-69.4)	74.0 (54.3-122)	454
Non-Hispanic whites	99-00	*	< LOD	35.5 (29.7-40.0)	60.9 (51.4-68.3)	74.3 (68.3-83.0)	703
	01-02	37.8 (31.5-45.4)	42.8 (33.9-51.2)	65.0 (52.3-82.9)	99.6 (78.4-130)	131 (103-165)	671
	03-04	18.7 (17.0-20.6)	22.9 (19.9-26.2)	38.0 (35.2-41.5)	56.6 (48.7-63.8)	69.0 (60.6-74.9)	872

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 20.1, 9.1, and 12.3, respectively.

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	10.5	0.8	9
		07-08	9.78	0.51	6
		09-10	7.25	0.47	10
	20-39	05-06	14.7	1.4	12
		07-08	14.2	0.7	15
		09-10	11.9	0.6	17
	40-59	05-06	31.8	3.4	12
		07-08	23.0	1.1	16
		09-10	23.4	1.5	17
60+	05-06	46.6	3.4	15	
	07-08	40.5	2.6	23	
	09-10	36.5	2.1	20	
Non-Hispanic White Female	12-19	05-06	6.76	0.95	10
		07-08	6.74	0.45	7
		09-10	5.69	0.61	8
	20-39	05-06	13.1	1.4	16
		07-08	12.5	0.8	13
		09-10	10.8	1.1	18
	40-59	05-06	25.6	1.2	13
		07-08	23.7	0.9	17
		09-10	19.5	0.9	17
	60+	05-06	47.4	3.5	17
		07-08	45.7	2.9	21
		09-10	40.8	2.8	22
Non-Hispanic Black Male	12-19	05-06	9.16	0.4	13
		07-08	7.63	0.94	6
		09-10	6.71	0.71	6
	20-39	05-06	12.7	0.8	6
		07-08	13.4	1.2	6
		09-10	8.65	1.1	7
	40-59	05-06	20.4	1.3	5
		07-08	23.6	2.6	6
		09-10	18.2	1.8	7
	60+	05-06	45.5	6.1	5
		07-08	36.3	4.4	8
		09-10	31.0	2.1	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.12, 0.2, and 0.22, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	5.50	0.65	14
		07-08	6.07	0.4	5
		09-10	4.70	0.41	6
	20-39	05-06	12.2	0.8	7
		07-08	13.4	1.3	8
		09-10	9.23	0.94	7
	40-59	05-06	25.1	2.6	7
		07-08	25.8	1.4	8
		09-10	19.8	1.8	7
	60+	05-06	69.4	8	5
07-08		54.2	5.4	7	
09-10		49.8	5.3	7	
Mexican American Male	12-19	05-06	4.25	1.01	11
		07-08	7.12	0.85	6
		09-10	6.08	0.48	8
	20-39	05-06	9.78	0.77	9
		07-08	10.2	0.5	9
		09-10	8.73	0.74	8
	40-59	05-06	18.9	2.8	4
		07-08	19.4	1.3	6
		09-10	19.0	1.1	7
	60+	05-06	34.5	2.4	4
07-08		31.3	2.6	5	
09-10		38.3	5.7	5	
Mexican American Female	12-19	05-06	3.62	0.73	16
		07-08	**4.01	1.25	5
		09-10	3.95	0.2	7
	20-39	05-06	8.51	0.79	9
		07-08	9.61	0.86	8
		09-10	6.40	0.97	10
	40-59	05-06	18.9	1.5	6
		07-08	19.5	2	6
		09-10	18.4	1.4	9
	60+	05-06	36.4	3.3	3
07-08		36.7	4.6	5	
09-10		43.6	6.2	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.12, 0.2, and 0.22, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	6.11	0.38	11
	20-39	09-10	8.06	0.83	13
	40-59	09-10	16.8	1.1	12
	60+	09-10	32.9	4.4	8
All Hispanic Female	12-19	09-10	4.14	0.24	10
	20-39	09-10	6.82	0.69	14
	40-59	09-10	17.3	1	14
	60+	09-10	37.9	4.1	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.12, 0.2, and 0.22, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	202 (168-239)	374 (314-426)	496 (429-571)	1885
	01-02	224 (192-261)	247 (219-287)	412 (347-498)	663 (549-785)	870 (696-1100)	1234
	03-04	105 (95.7-116)	123 (111-136)	240 (219-263)	357 (325-395)	443 (395-487)	1871
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	126 (93.2-155)	648
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	77.6 (67.4-84.8)	94.5 (77.6-122)	584
20 years and older	99-00	*	< LOD	232 (196-268)	403 (349-458)	521 (458-607)	1237
	01-02	224 (192-261)	247 (219-287)	412 (347-498)	663 (549-785)	870 (696-1100)	1234
	03-04	124 (112-138)	146 (125-172)	259 (235-285)	376 (334-422)	466 (403-528)	1287
Gender Males	99-00	*	< LOD	189 (134-239)	353 (278-417)	449 (378-526)	908
	01-02	226 (190-270)	263 (223-301)	425 (347-540)	678 (547-794)	883 (666-1180)	564
	03-04	108 (95.4-123)	123 (108-141)	231 (206-261)	351 (286-424)	450 (374-538)	920
Females	99-00	*	< LOD	213 (174-263)	400 (344-467)	553 (467-651)	977
	01-02	222 (190-260)	239 (207-281)	397 (338-474)	644 (526-771)	864 (720-1060)	670
	03-04	103 (92.8-113)	121 (101-142)	249 (225-277)	363 (336-395)	429 (395-512)	951
Race/ethnicity Mexican Americans	99-00	*	< LOD	128 (<LOD-167)	284 (242-334)	380 (328-419)	624
	01-02	117 (99.4-139)	130 (107-157)	233 (198-270)	409 (278-524)	524 (384-731)	260
	03-04	*	< LOD	141 (106-188)	221 (188-337)	327 (210-426)	424
Non-Hispanic blacks	99-00	*	< LOD	191 (150-234)	374 (267-424)	477 (389-568)	402
	01-02	229 (199-264)	229 (190-284)	371 (333-477)	643 (480-799)	821 (596-1260)	219
	03-04	92.9 (73.3-118)	106 (77.0-125)	219 (165-260)	362 (279-460)	461 (372-689)	454
Non-Hispanic whites	99-00	*	< LOD	222 (183-270)	403 (346-460)	520 (450-615)	703
	01-02	246 (206-293)	275 (233-325)	443 (365-553)	684 (549-870)	897 (718-1150)	671
	03-04	116 (105-127)	136 (120-165)	258 (231-286)	375 (333-418)	466 (402-519)	872

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	57.9	5.2	9
		07-08	48.6	1.6	6
		09-10	38.3	1.9	10
	20-39	05-06	109	14	12
		07-08	93.4	5	15
		09-10	78.2	5.3	17
	40-59	05-06	240	27	12
		07-08	169	8	16
		09-10	159	10	17
60+	05-06	316	21	15	
	07-08	257	14	23	
	09-10	220	10	20	
Non-Hispanic White Female	12-19	05-06	36.0	4.9	10
		07-08	31.5	2.2	7
		09-10	27.3	3.1	8
	20-39	05-06	85.9	10.4	16
		07-08	74.7	5.5	13
		09-10	57.6	6.6	18
	40-59	05-06	189	13	13
		07-08	157	7	17
		09-10	123	7	17
	60+	05-06	344	24	17
		07-08	306	19	21
		09-10	246	15	22
Non-Hispanic Black Male	12-19	05-06	46.0	1.5	13
		07-08	35.8	3.9	6
		09-10	30.7	3.6	6
	20-39	05-06	75.2	5.9	6
		07-08	75.1	6.4	6
		09-10	47.9	5.1	7
	40-59	05-06	130	8	5
		07-08	151	16	6
		09-10	111	10	7
	60+	05-06	270	32	5
		07-08	219	27	8
		09-10	166	11	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	27.2	3.2	14
		07-08	28.9	2.5	5
		09-10	20.7	1.6	6
	20-39	05-06	70.2	4.3	7
		07-08	67.9	7.1	8
		09-10	45.7	4.7	7
	40-59	05-06	160	17	7
		07-08	156	12	8
		09-10	112	10	7
	60+	05-06	461	45	5
07-08		325	27	7	
09-10		283	26	7	
Mexican American Male	12-19	05-06	22.8	5.3	11
		07-08	37.9	4.9	6
		09-10	28.7	2.6	8
	20-39	05-06	68.7	4.7	9
		07-08	70.2	4.8	9
		09-10	53.6	5.9	8
	40-59	05-06	156	28	4
		07-08	139	12	6
		09-10	135	9	7
	60+	05-06	248	17	4
07-08		227	25	5	
09-10		235	35	5	
Mexican American Female	12-19	05-06	20.3	4.1	16
		07-08	**19.3	5.8	5
		09-10	18.4	0.9	7
	20-39	05-06	56.7	5.7	9
		07-08	55.4	5	8
		09-10	34.6	5.5	10
	40-59	05-06	140	13	6
		07-08	131	14	6
		09-10	117	8	9
	60+	05-06	280	43	3
07-08		252	35	5	
09-10		239	29	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	28.7	2.1	11
	20-39	09-10	52.8	8	13
	40-59	09-10	116	9	12
	60+	09-10	206	27	8
All Hispanic Female	12-19	09-10	19.2	1	10
	20-39	09-10	37.4	4	14
	40-59	09-10	108	7	14
	60+	09-10	221	19	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1870
	01-02	*	< LOD	< LOD	12.5 (10.5-15.3)	17.0 (14.3-20.0)	1238
	03-04	*	< LOD	< LOD	< LOD	< LOD	1869
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	642
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	< LOD	< LOD	585
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1228
	01-02	*	< LOD	< LOD	12.5 (10.5-15.3)	17.0 (14.3-20.0)	1238
	03-04	*	< LOD	< LOD	< LOD	< LOD	1284
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	895
	01-02	*	< LOD	< LOD	12.1 (<LOD-14.8)	15.1 (12.9-18.5)	567
	03-04	*	< LOD	< LOD	< LOD	< LOD	918
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	975
	01-02	*	< LOD	< LOD	13.0 (10.7-16.8)	18.3 (15.7-21.1)	671
	03-04	*	< LOD	< LOD	< LOD	< LOD	951
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	618
	01-02	*	< LOD	< LOD	9.60 (<LOD-11.6)	12.2 (<LOD-20.6)	262
	03-04	*	< LOD	< LOD	< LOD	< LOD	423
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	396
	01-02	*	< LOD	< LOD	14.6 (11.2-20.0)	19.9 (14.6-23.9)	220
	03-04	*	< LOD	< LOD	< LOD	< LOD	454
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	701
	01-02	*	< LOD	< LOD	12.9 (9.90-15.9)	17.3 (14.7-20.6)	672
	03-04	*	< LOD	< LOD	< LOD	< LOD	871

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 20.3, 9.3, and 12.3, respectively.

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	1.68	0.43	9
		07-08	2.18	0.11	6
		09-10	1.89	0.07	10
	20-39	05-06	1.92	0.26	12
		07-08	2.33	0.29	15
		09-10	2.25	0.1	17
	40-59	05-06	3.99	0.38	12
		07-08	2.99	0.16	16
		09-10	3.06	0.17	17
60+	05-06	5.48	0.47	15	
	07-08	4.80	0.3	23	
	09-10	4.56	0.25	21	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	1.61	0.4	7
		09-10	1.60	0.21	8
	20-39	05-06	2.47	0.2	16
		07-08	2.29	0.3	13
		09-10	2.04	0.21	18
	40-59	05-06	3.93	0.25	13
		07-08	3.29	0.25	17
		09-10	2.91	0.14	17
	60+	05-06	6.02	0.36	17
		07-08	6.23	0.41	21
		09-10	5.59	0.35	22
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	1.73	0.31	6
		09-10	1.49	0.03	5
	20-39	05-06	2.08	0.11	6
		07-08	**1.37	0.47	6
		09-10	1.52	0.18	7
	40-59	05-06	2.57	0.18	5
		07-08	3.26	0.33	6
		09-10	2.36	0.25	7
	60+	05-06	5.18	0.91	5
		07-08	4.15	0.53	8
		09-10	3.46	0.33	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.08, 0.13, and 0.14, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	1.23	0.14	6
	20-39	05-06	2.44	0.23	7
		07-08	*	*	8
		09-10	1.89	0.18	7
	40-59	05-06	3.84	0.36	7
		07-08	3.97	0.29	8
		09-10	3.17	0.41	7
	60+	05-06	9.10	1.09	5
07-08		8.05	0.9	7	
09-10		6.54	0.63	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	1.67	0.09	7
	20-39	05-06	2.20	0.29	9
		07-08	1.54	0.34	9
		09-10	1.67	0.15	8
	40-59	05-06	3.37	0.53	4
		07-08	2.47	0.61	6
		09-10	2.73	0.18	7
	60+	05-06	4.52	0.22	4
07-08		4.55	0.44	5	
09-10		5.43	0.74	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	**1.41	0.43	5
		09-10	1.16	0.11	7
	20-39	05-06	1.81	0.32	9
		07-08	*	*	8
		09-10	1.64	0.24	10
	40-59	05-06	4.02	0.32	6
		07-08	3.94	0.35	6
		09-10	4.04	0.32	9
	60+	05-06	6.50	0.96	3
07-08		7.38	0.68	5	
09-10		7.73	0.92	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.08, 0.13, and 0.14, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	1.77	0.12	10
	20-39	09-10	1.74	0.12	13
	40-59	09-10	2.50	0.14	12
	60+	09-10	4.67	0.6	8
All Hispanic Female	12-19	09-10	1.20	0.08	10
	20-39	09-10	1.70	0.17	14
	40-59	09-10	3.47	0.3	14
	60+	09-10	6.25	0.74	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.08, 0.13, and 0.14, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1870
	01-02	*	< LOD	< LOD	86.5 (68.8-108)	121 (99.5-146)	1238
	03-04	*	< LOD	< LOD	< LOD	< LOD	1869
Age group							
12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	642
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	< LOD	< LOD	585
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1228
	01-02	*	< LOD	< LOD	86.5 (68.8-108)	121 (99.5-146)	1238
	03-04	*	< LOD	< LOD	< LOD	< LOD	1284
Gender							
Males	99-00	*	< LOD	< LOD	< LOD	< LOD	895
	01-02	*	< LOD	< LOD	84.1 (<LOD-104)	108 (90.6-142)	567
	03-04	*	< LOD	< LOD	< LOD	< LOD	918
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	975
	01-02	*	< LOD	< LOD	89.8 (67.9-121)	123 (102-157)	671
	03-04	*	< LOD	< LOD	< LOD	< LOD	951
Race/ethnicity							
Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	618
	01-02	*	< LOD	< LOD	74.7 (<LOD-104)	107 (<LOD-167)	262
	03-04	*	< LOD	< LOD	< LOD	< LOD	423
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	396
	01-02	*	< LOD	< LOD	92.6 (62.8-126)	123 (82.6-169)	220
	03-04	*	< LOD	< LOD	< LOD	< LOD	454
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	701
	01-02	*	< LOD	< LOD	88.1 (67.9-119)	124 (96.6-152)	672
	03-04	*	< LOD	< LOD	< LOD	< LOD	871

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	9.49	2.41	9
		07-08	10.9	0.7	6
		09-10	10.0	0.3	10
	20-39	05-06	13.8	2	12
		07-08	15.4	1.7	15
		09-10	14.8	0.8	17
	40-59	05-06	30.2	3.2	12
		07-08	21.9	1	16
		09-10	20.8	1.2	17
	60+	05-06	37.3	3	15
07-08		30.5	1.6	23	
09-10		27.5	1.4	21	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	7.48	1.85	7
		09-10	7.66	1.04	8
	20-39	05-06	16.1	1.5	16
		07-08	13.8	1.8	13
		09-10	10.9	1.2	18
	40-59	05-06	29.1	2.3	13
		07-08	21.8	1.7	17
		09-10	18.4	1	17
	60+	05-06	44.0	2.6	17
		07-08	41.8	2.9	21
		09-10	33.7	1.8	22
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	8.07	1.37	6
		09-10	6.85	0.44	5
	20-39	05-06	12.3	0.8	6
		07-08	**8.05	2.77	6
		09-10	8.44	0.85	7
	40-59	05-06	16.4	1.2	5
		07-08	20.8	2	6
		09-10	14.5	1.5	7
	60+	05-06	30.7	5	5
		07-08	25.0	3.1	8
		09-10	18.4	1.7	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	5.39	0.54	6
	20-39	05-06	14.0	1.3	7
		07-08	*	*	8
		09-10	9.32	0.88	7
	40-59	05-06	24.6	2.4	7
		07-08	23.9	2.1	8
		09-10	17.9	2.3	7
	60+	05-06	60.7	6.7	5
07-08		48.1	4.7	7	
09-10		37.2	3	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	7.80	0.44	7
	20-39	05-06	15.7	2	9
		07-08	10.0	2.2	9
		09-10	10.2	1.2	8
	40-59	05-06	27.8	5.5	4
		07-08	17.2	4.2	6
		09-10	19.2	1.1	7
	60+	05-06	32.5	1.2	4
07-08		33.1	4.3	5	
09-10		33.3	4.6	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	6.79	1.99	5
		09-10	5.43	0.48	7
	20-39	05-06	12.3	2.2	9
		07-08	*	*	8
		09-10	8.87	1.33	10
	40-59	05-06	29.8	2.8	6
		07-08	26.6	2.8	6
		09-10	25.4	1.3	9
	60+	05-06	49.7	9.5	3
07-08		50.8	5.6	5	
09-10		42.6	4.3	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	8.20	0.5	10
	20-39	09-10	11.1	1.1	13
	40-59	09-10	17.2	1	12
	60+	09-10	29.3	3.6	8
All Hispanic Female	12-19	09-10	5.57	0.36	10
	20-39	09-10	9.31	0.96	14
	40-59	09-10	21.6	1.7	14
	60+	09-10	36.2	3.4	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	406 (359-453)	674 (597-767)	913 (787-1010)	1921
	01-02	346 (<LOD-394)	333 (<LOD-402)	573 (498-668)	944 (780-1090)	1260 (998-1610)	1171
	03-04	*	< LOD	336 (283-389)	582 (490-658)	767 (645-913)	1851
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	421 (363-517)	667
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	244 (<LOD-330)	352 (264-458)	581
20 years and older	99-00	*	< LOD	445 (389-496)	710 (624-802)	948 (822-1080)	1254
	01-02	346 (<LOD-394)	333 (<LOD-402)	573 (498-668)	944 (780-1090)	1260 (998-1610)	1171
	03-04	220 (<LOD-244)	223 (<LOD-243)	358 (297-421)	597 (502-719)	794 (665-978)	1270
Gender Males	99-00	*	< LOD	< LOD	517 (447-580)	704 (563-838)	919
	01-02	*	< LOD	442 (346-579)	767 (593-968)	1030 (837-1240)	517
	03-04	*	< LOD	270 (244-320)	457 (377-559)	668 (501-856)	910
Females	99-00	*	< LOD	504 (422-579)	802 (674-928)	1010 (928-1180)	1002
	01-02	410 (356-472)	405 (335-502)	647 (574-751)	1020 (858-1360)	1450 (1060-1780)	654
	03-04	235 (<LOD-256)	238 (225-248)	402 (321-486)	640 (551-749)	829 (675-1020)	941
Race/ethnicity Mexican Americans	99-00	*	< LOD	418 (365-502)	703 (610-873)	940 (737-1230)	632
	01-02	*	< LOD	432 (394-545)	755 (578-1220)	1150 (696-1640)	250
	03-04	*	< LOD	296 (225-356)	452 (363-540)	588 (417-861)	419
Non-Hispanic blacks	99-00	*	< LOD	444 (371-519)	741 (566-983)	1120 (799-1560)	411
	01-02	421 (352-503)	420 (339-509)	682 (537-907)	1110 (956-1520)	1640 (1130-1900)	210
	03-04	*	< LOD	345 (276-455)	642 (513-883)	926 (636-1310)	448
Non-Hispanic whites	99-00	*	< LOD	391 (333-452)	625 (562-754)	861 (676-1010)	721
	01-02	349 (<LOD-409)	335 (<LOD-421)	574 (496-679)	945 (764-1170)	1290 (972-1660)	632
	03-04	*	< LOD	343 (282-403)	585 (464-674)	758 (635-922)	865

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 329.0, 319.0, and 218.0, respectively.

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	123	13	9
		07-08	114	8	6
		09-10	96.4	7.3	10
	20-39	05-06	129	8	12
		07-08	125	12	15
		09-10	109	5	17
	40-59	05-06	238	25	12
		07-08	164	11	16
		09-10	172	16	17
60+	05-06	379	38	15	
	07-08	306	24	23	
	09-10	284	18	21	
Non-Hispanic White Female	12-19	05-06	106	9	10
		07-08	103	7	7
		09-10	83.6	6.2	8
	20-39	05-06	179	19	16
		07-08	139	7	13
		09-10	126	11	18
	40-59	05-06	304	22	13
		07-08	222	15	17
		09-10	198	10	17
60+	05-06	546	66	17	
	07-08	435	51	21	
	09-10	407	31	22	
Non-Hispanic Black Male	12-19	05-06	142	12	13
		07-08	111	12	6
		09-10	90.2	4.3	5
	20-39	05-06	127	9	6
		07-08	136	10	6
		09-10	102	6	7
	40-59	05-06	200	32	5
		07-08	190	17	6
		09-10	161	14	7
60+	05-06	420	82	5	
	07-08	314	32	8	
	09-10	265	11	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 13.0, 22.6, and 24.0, respectively.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	153	22	14
		07-08	100	12	5
		09-10	81.7	5.6	6
	20-39	05-06	188	18	7
		07-08	193	26	8
		09-10	139	15	7
	40-59	05-06	381	43	7
		07-08	303	25	8
		09-10	239	29	7
60+	05-06	927	135	5	
	07-08	660	88	7	
	09-10	672	133	7	
Mexican American Male	12-19	05-06	111	9	11
		07-08	117	10	6
		09-10	98.4	10.6	8
	20-39	05-06	180	21	9
		07-08	130	9	9
		09-10	130	12	8
	40-59	05-06	220	19	4
		07-08	217	14	6
		09-10	231	32	7
60+	05-06	350	46	4	
	07-08	266	23	5	
	09-10	413	78	5	
Mexican American Female	12-19	05-06	111	5	16
		07-08	107	12	5
		09-10	79.3	5.7	7
	20-39	05-06	184	12	9
		07-08	174	14	8
		09-10	123	19	10
	40-59	05-06	410	60	6
		07-08	290	20	6
		09-10	336	34	9
60+	05-06	540	65	3	
	07-08	426	34	5	
	09-10	552	52	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 13.0, 22.6, and 24.0, respectively.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	109	11	11
	20-39	09-10	128	13	13
	40-59	09-10	200	22	12
	60+	09-10	361	68	7
All Hispanic Female	12-19	09-10	78.4	4.7	10
	20-39	09-10	121	14	14
	40-59	09-10	286	29	14
	60+	09-10	458	48	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 13.0, 22.6, and 24.0, respectively.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	2530 (2230-2880)	4260 (3770-4760)	5950 (5090-6790)	1921
	01-02	2230 (<LOD-2540)	2170 (<LOD-2550)	3860 (3180-4520)	6460 (5140-8290)	9110 (6940-11400)	1171
	03-04	*	< LOD	2180 (1830-2540)	3760 (3100-4540)	5020 (4190-6070)	1851
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	1910 (1600-2340)	667
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	1160 (<LOD1590)	1780 (1160-2850)	581
20 years and older	99-00	*	< LOD	2810 (2480-3110)	4570 (4100-5020)	6200 (5340-7300)	1254
	01-02	2230 (<LOD-2540)	2170 (<LOD-2550)	3860 (3180-4520)	6460 (5140-8290)	9110 (6940-11400)	1171
	03-04	1380 (<LOD-1540)	1360 (<LOD-1470)	2350 (1970-2900)	4030 (3370-4700)	5340 (4490-6370)	1270
Gender Males	99-00	*	< LOD	< LOD	3160 (2760-3760)	4160 (3320-5570)	919
	01-02	*	< LOD	3160 (2410-4070)	5270 (4070-7140)	7620 (6020-9760)	517
	03-04	*	< LOD	1780 (1540-2070)	3090 (2410-4020)	4190 (3410-5350)	910
Females	99-00	*	< LOD	3110 (2680-3560)	5090 (4610-5740)	6760 (5870-8710)	1002
	01-02	2590 (2250-2980)	2620 (2160-3000)	4340 (3880-4860)	6990 (5870-9040)	10000 (7070-	654
	03-04	1420 (<LOD-1560)	1410 (1300-1510)	2700 (2210-3030)	4340 (3750-4830)	5770 (4590-6740)	941
Race/ethnicity Mexican Americans	99-00	*	< LOD	2470 (2240-2990)	4350 (3660-5570)	6560 (5340-7590)	632
	01-02	*	< LOD	3410 (2760-3860)	5810 (4250-7670)	8050 (5760-11800)	250
	03-04	*	< LOD	1880 (1560-2220)	3240 (2450-3880)	3910 (3240-4630)	419
Non-Hispanic blacks	99-00	*	< LOD	2520 (2090-2950)	4770 (4040-5740)	7140 (4740-10700)	411
	01-02	2480 (2050-3000)	2460 (2060-2970)	4170 (3160-5560)	7250 (5470-9920)	9920 (7990-12000)	210
	03-04	*	< LOD	2150 (1780-2880)	3860 (3080-5640)	5720 (3750-7830)	448
Non-Hispanic whites	99-00	*	< LOD	2560 (2160-2910)	4120 (3580-4780)	5800 (4740-6790)	721
	01-02	2270 (<LOD-2660)	2200 (<LOD-2770)	3860 (3090-4720)	6530 (4890-8860)	9150 (6630-12300)	632
	03-04	*	< LOD	2220 (1830-2700)	3770 (3040-4680)	5050 (4190-6350)	865

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	674	73	9
		07-08	570	41	6
		09-10	514	41	10
	20-39	05-06	936	79	12
		07-08	809	66	15
		09-10	721	43	17
	40-59	05-06	1800	219	12
		07-08	1210	84	16
		09-10	1160	106	17
60+	05-06	2580	245	15	
	07-08	1950	134	23	
	09-10	1700	92	21	
Non-Hispanic White Female	12-19	05-06	562	44	10
		07-08	476	26	7
		09-10	398	32	8
	20-39	05-06	1180	153	16
		07-08	829	50	13
		09-10	674	64	18
	40-59	05-06	2240	191	13
		07-08	1470	107	17
		09-10	1250	62	17
60+	05-06	3970	469	17	
	07-08	2920	348	21	
	09-10	2460	164	22	
Non-Hispanic Black Male	12-19	05-06	712	59	13
		07-08	523	48	6
		09-10	412	28	5
	20-39	05-06	761	71	6
		07-08	771	71	6
		09-10	573	23	7
	40-59	05-06	1270	183	5
		07-08	1210	109	6
		09-10	991	83	7
60+	05-06	2470	424	5	
	07-08	1900	184	8	
	09-10	1420	61	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	753	106	14
		07-08	483	75	5
		09-10	360	22	6
	20-39	05-06	1080	109	7
		07-08	978	136	8
		09-10	683	73	7
	40-59	05-06	2450	300	7
		07-08	1830	184	8
		09-10	1350	173	7
60+	05-06	6220	925	5	
	07-08	3920	407	7	
	09-10	3800	678	7	
Mexican American Male	12-19	05-06	606	47	11
		07-08	614	32	6
		09-10	458	43	8
	20-39	05-06	1280	156	9
		07-08	906	109	9
		09-10	784	70	8
	40-59	05-06	1800	216	4
		07-08	1540	138	6
		09-10	1620	211	7
60+	05-06	2500	251	4	
	07-08	1970	302	5	
	09-10	2540	493	5	
Mexican American Female	12-19	05-06	605	23	16
		07-08	524	56	5
		09-10	369	24	7
	20-39	05-06	1240	104	9
		07-08	1000	69	8
		09-10	664	102	10
	40-59	05-06	3050	469	6
		07-08	1960	171	6
		09-10	2100	156	9
60+	05-06	4190	843	3	
	07-08	2900	189	5	
	09-10	3050	242	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	508	54	11
	20-39	09-10	837	128	13
	40-59	09-10	1370	148	12
	60+	09-10	2210	436	7
All Hispanic Female	12-19	09-10	362	20	10
	20-39	09-10	662	76	14
	40-59	09-10	1770	165	14
	60+	09-10	2670	230	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1915
	01-02	*	< LOD	< LOD	11.3 (9.30-13.6)	15.8 (13.3-19.8)	1236
	03-04	*	< LOD	6.10 (5.50-6.80)	9.00 (8.30-9.70)	11.0 (9.90-12.2)	1878
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	659
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	< LOD	4.80 (<LOD-5.90)	588
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1256
	01-02	*	< LOD	< LOD	11.3 (9.30-13.6)	15.8 (13.3-19.8)	1236
	03-04	*	< LOD	6.60 (5.90-7.20)	9.30 (8.60-10.1)	11.3 (10.1-12.7)	1290
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	920
	01-02	*	< LOD	< LOD	10.8 (9.10-13.3)	14.5 (11.7-19.4)	564
	03-04	*	< LOD	5.90 (5.30-6.40)	8.90 (7.90-9.60)	11.0 (9.60-12.7)	923
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	995
	01-02	*	< LOD	6.10 (<LOD-7.80)	11.8 (9.40-14.3)	16.6 (13.7-20.8)	672
	03-04	*	< LOD	6.50 (5.70-7.20)	9.10 (8.30-10.1)	11.0 (10.0-12.2)	955
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	632
	01-02	*	< LOD	< LOD	< LOD	8.70 (<LOD-12.7)	262
	03-04	*	< LOD	< LOD	6.50 (5.20-7.90)	7.80 (6.70-9.20)	425
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	408
	01-02	*	< LOD	7.70 (<LOD-9.30)	13.9 (9.60-18.4)	18.4 (14.2-24.0)	218
	03-04	*	< LOD	6.40 (5.30-8.20)	9.90 (8.50-13.4)	14.4 (9.60-20.1)	455
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	717
	01-02	*	< LOD	< LOD	11.7 (9.50-14.3)	16.7 (13.6-20.2)	672
	03-04	*	< LOD	6.50 (5.80-7.10)	9.30 (8.60-10.0)	11.1 (10.1-12.2)	877

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 14.2, 6.0, and 4.5, respectively.

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	2.55	0.14	9
		07-08	2.31	0.31	6
		09-10	2.22	0.1	10
	20-39	05-06	2.49	0.23	12
		07-08	2.93	0.18	15
		09-10	2.59	0.17	17
	40-59	05-06	4.48	0.54	12
		07-08	3.96	0.13	16
		09-10	3.77	0.21	17
60+	05-06	7.26	0.4	15	
	07-08	7.08	0.78	23	
	09-10	6.03	0.24	20	
Non-Hispanic White Female	12-19	05-06	1.55	0.22	10
		07-08	1.61	0.36	7
		09-10	1.70	0.24	8
	20-39	05-06	2.57	0.23	16
		07-08	2.40	0.18	13
		09-10	2.06	0.12	17
	40-59	05-06	4.25	0.2	13
		07-08	4.12	0.16	17
		09-10	3.65	0.17	17
	60+	05-06	7.83	0.56	17
		07-08	8.09	0.42	21
		09-10	7.06	0.48	22
Non-Hispanic Black Male	12-19	05-06	2.34	0.15	13
		07-08	2.14	0.46	6
		09-10	1.43	0.17	6
	20-39	05-06	2.95	0.16	6
		07-08	2.94	0.28	6
		09-10	2.14	0.29	5
	40-59	05-06	4.00	0.24	5
		07-08	4.41	0.38	6
		09-10	2.81	0.31	7
	60+	05-06	8.16	1.26	5
		07-08	6.56	0.86	8
		09-10	5.33	0.38	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.62, 1.08, and 1.1, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	1.13	0.15	5
	20-39	05-06	2.52	0.1	7
		07-08	2.55	0.32	8
		09-10	2.17	0.19	7
	40-59	05-06	4.64	0.44	7
		07-08	4.40	0.5	8
		09-10	4.05	0.37	7
60+	05-06	12.5	1.7	5	
	07-08	11.4	1.1	7	
	09-10	8.95	0.84	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	1.84	0.13	6
		09-10	1.87	0.31	8
	20-39	05-06	2.13	0.26	9
		07-08	2.44	0.31	9
		09-10	2.09	0.17	8
	40-59	05-06	3.61	0.63	4
		07-08	3.96	0.38	6
		09-10	3.45	0.19	7
60+	05-06	5.59	0.16	4	
	07-08	5.92	0.34	5	
	09-10	6.57	1.05	5	
Mexican American Female	12-19	05-06	1.14	0.16	16
		07-08	1.50	0.29	5
		09-10	1.16	0.11	7
	20-39	05-06	1.65	0.23	9
		07-08	2.81	0.33	8
		09-10	1.46	0.21	10
	40-59	05-06	3.23	0.62	6
		07-08	4.15	0.81	6
		09-10	3.51	0.26	9
60+	05-06	6.48	0.82	3	
	07-08	6.35	0.75	5	
	09-10	7.45	0.93	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.62, 1.08, and 1.1, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	1.78	0.25	11
	20-39	09-10	1.83	0.18	13
	40-59	09-10	3.06	0.21	11
	60+	09-10	6.07	0.84	7
All Hispanic Female	12-19	09-10	1.21	0.09	10
	20-39	09-10	1.50	0.15	14
	40-59	09-10	3.25	0.2	14
	60+	09-10	6.22	0.73	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.62, 1.08, and 1.1, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1915
	01-02	*	< LOD	< LOD	77.8 (62.8-96.3)	117 (90.3-133)	1236
	03-04	*	< LOD	40.7 (37.4-43.0)	60.3 (53.2-67.4)	76.1 (66.9-87.4)	1878
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	659
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	< LOD	23.8 (<LOD-27.2)	588
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1256
	01-02	*	< LOD	< LOD	77.8 (62.8-96.3)	117 (90.3-133)	1236
	03-04	*	< LOD	43.0 (39.2-47.8)	63.5 (55.6-71.5)	80.7 (67.9-89.9)	1290
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	920
	01-02	*	< LOD	< LOD	76.1 (54.7-93.7)	107 (83.5-133)	564
	03-04	*	< LOD	39.3 (35.1-43.4)	57.3 (49.3-66.1)	67.8 (58.7-90.4)	923
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	995
	01-02	*	< LOD	37.8 (<LOD-50.2)	80.4 (62.9-107)	121 (85.7-167)	672
	03-04	*	< LOD	41.8 (37.7-45.2)	63.6 (55.9-72.9)	80.7 (70.5-88.3)	955
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	632
	01-02	*	< LOD	< LOD	< LOD	66.0 (<LOD-111)	262
	03-04	*	< LOD	< LOD	44.5 (34.2-52.0)	52.8 (44.5-76.6)	425
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	408
	01-02	*	< LOD	43.8 (<LOD-53.8)	81.9 (58.2-117)	123 (81.9-169)	218
	03-04	*	< LOD	39.7 (30.6-48.0)	67.3 (48.0-93.0)	93.0 (66.7-137)	455
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	717
	01-02	*	< LOD	< LOD	80.8 (61.6-107)	121 (88.6-142)	672
	03-04	*	< LOD	42.6 (38.6-45.1)	63.4 (55.4-67.9)	78.8 (67.9-84.7)	877

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	13.8	0.6	9
		07-08	11.6	1.6	6
		09-10	11.8	0.6	10
	20-39	05-06	18.0	2.1	12
		07-08	19.3	1.1	15
		09-10	17.0	1.3	17
	40-59	05-06	34.2	4.3	12
		07-08	29.2	1.1	16
		09-10	25.6	1.5	17
	60+	05-06	49.2	2.3	15
07-08		45.3	4.5	23	
09-10		36.4	1.2	20	
Non-Hispanic White Female	12-19	05-06	8.26	1.17	10
		07-08	7.53	1.75	7
		09-10	8.16	1.16	8
	20-39	05-06	16.8	1.7	16
		07-08	14.4	1.2	13
		09-10	10.8	0.7	17
	40-59	05-06	31.4	2.2	13
		07-08	27.2	1.2	17
		09-10	23.1	1.3	17
	60+	05-06	56.9	3.7	17
		07-08	54.3	3	21
		09-10	42.6	2.5	22
Non-Hispanic Black Male	12-19	05-06	11.7	0.6	13
		07-08	10.1	2.1	6
		09-10	6.53	0.89	6
	20-39	05-06	17.5	1	6
		07-08	16.4	1.4	6
		09-10	12.4	1.2	5
	40-59	05-06	25.5	1.5	5
		07-08	28.3	2.7	6
		09-10	17.4	2.3	7
	60+	05-06	48.9	7.8	5
		07-08	39.5	5.1	8
		09-10	28.4	1.8	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	5.09	0.75	5
	20-39	05-06	14.5	0.7	7
		07-08	12.9	1.6	8
		09-10	10.7	0.9	7
	40-59	05-06	29.8	3.1	7
		07-08	26.6	3.4	8
		09-10	22.8	2.1	7
	60+	05-06	83.0	10	5
07-08		68.3	5.7	7	
09-10		50.9	3.9	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	9.76	0.73	6
		09-10	8.83	1.5	8
	20-39	05-06	15.0	1.9	9
		07-08	16.0	1.9	9
		09-10	12.8	1.3	8
	40-59	05-06	29.7	6.3	4
		07-08	28.3	3.4	6
		09-10	24.5	1.6	7
	60+	05-06	40.5	2.9	4
07-08		42.9	3.8	5	
09-10		40.2	6.5	5	
Mexican American Female	12-19	05-06	6.29	0.9	16
		07-08	7.29	1.35	5
		09-10	5.40	0.49	7
	20-39	05-06	11.1	1.7	9
		07-08	16.0	1.5	8
		09-10	7.97	1.17	10
	40-59	05-06	24.1	4.6	6
		07-08	27.9	5.5	6
		09-10	22.3	1.4	9
	60+	05-06	49.3	8.2	3
07-08		43.7	5.7	5	
09-10		41.1	4.5	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	8.36	1.22	11
	20-39	09-10	11.6	1.3	13
	40-59	09-10	21.5	1.7	11
	60+	09-10	36.9	5.3	7
All Hispanic Female	12-19	09-10	5.60	0.41	10
	20-39	09-10	8.27	0.84	14
	40-59	09-10	20.3	1.2	14
	60+	09-10	36.2	3.5	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1898
	01-02	*	< LOD	< LOD	< LOD	< LOD	1228
	03-04	*	< LOD	< LOD	4.10 (<LOD-4.40)	5.20 (4.30-5.80)	1876
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	658
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	< LOD	< LOD	588
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1240
	01-02	*	< LOD	< LOD	< LOD	< LOD	1228
	03-04	*	< LOD	< LOD	4.30 (3.90-4.60)	5.30 (4.50-6.10)	1288
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	912
	01-02	*	< LOD	< LOD	< LOD	< LOD	559
	03-04	*	< LOD	< LOD	< LOD	4.60 (3.80-5.30)	921
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	986
	01-02	*	< LOD	< LOD	< LOD	6.40 (<LOD-9.20)	669
	03-04	*	< LOD	< LOD	4.40 (4.00-4.90)	5.50 (4.50-6.60)	955
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	630
	01-02	*	< LOD	< LOD	< LOD	< LOD	262
	03-04	*	< LOD	< LOD	< LOD	3.80 (<LOD-5.50)	424
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	404
	01-02	*	< LOD	< LOD	< LOD	7.50 (<LOD-10.0)	217
	03-04	*	< LOD	< LOD	4.50 (<LOD-6.10)	6.20 (4.40-10.3)	454
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	709
	01-02	*	< LOD	< LOD	< LOD	< LOD	665
	03-04	*	< LOD	< LOD	4.10 (<LOD-4.50)	5.20 (4.30-5.90)	877

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 12.1, 5.8, and 3.8, respectively.

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	*	*	12
		07-08	*	*	15
		09-10	*	*	17
	40-59	05-06	1.21	0.16	12
		07-08	.931	0.089	16
		09-10	.909	0.052	17
	60+	05-06	2.34	0.19	15
		07-08	2.13	0.23	23
		09-10	1.52	0.1	20
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	*	*	16
		07-08	*	*	13
		09-10	*	*	18
	40-59	05-06	1.31	0.19	13
		07-08	1.32	0.07	17
		09-10	.996	0.062	17
	60+	05-06	2.86	0.21	17
		07-08	2.98	0.21	21
		09-10	2.07	0.19	22
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	5
	20-39	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	1.26	0.18	5
		07-08	1.32	0.1	6
		09-10	.781	0.074	7
	60+	05-06	**3.47	1.25	5
		07-08	2.04	0.45	8
		09-10	1.34	0.13	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.42, 0.74, and 0.78, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	5
	20-39	05-06	.712	0.117	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	1.81	0.21	7
		07-08	1.68	0.17	8
		09-10	1.17	0.22	7
	60+	05-06	6.40	1.64	5
07-08		4.50	0.52	7	
09-10		3.54	0.37	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	9
		09-10	*	*	7
	40-59	05-06	1.01	0.24	4
		07-08	.984	0.206	6
		09-10	.957	0.071	7
	60+	05-06	1.29	0.25	4
07-08		1.74	0.22	5	
09-10		1.95	0.38	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	.925	0.133	8
		09-10	*	*	10
	40-59	05-06	1.08	0.3	6
		07-08	*	*	6
		09-10	1.06	0.09	9
	60+	05-06	2.34	0.3	3
07-08		2.92	0.38	5	
09-10		2.30	0.29	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.42, 0.74, and 0.78, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	9
	20-39	09-10	*	*	12
	40-59	09-10	1.00	0.1	11
	60+	09-10	1.82	0.29	7
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	.917	0.083	14
	60+	09-10	2.30	0.2	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.42, 0.74, and 0.78, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1898
	01-02	*	< LOD	< LOD	< LOD	< LOD	1228
	03-04	*	< LOD	< LOD	27.5 (<LOD-30.1)	34.1 (30.2-39.6)	1876
Age group							
12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	658
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	< LOD	< LOD	588
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1240
	01-02	*	< LOD	< LOD	< LOD	< LOD	1228
	03-04	*	< LOD	< LOD	28.6 (26.4-31.2)	36.4 (31.5-42.7)	1288
Gender							
Males	99-00	*	< LOD	< LOD	< LOD	< LOD	912
	01-02	*	< LOD	< LOD	< LOD	< LOD	559
	03-04	*	< LOD	< LOD	< LOD	28.8 (25.4-34.5)	921
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	986
	01-02	*	< LOD	< LOD	< LOD	50.7 (<LOD-74.3)	669
	03-04	*	< LOD	< LOD	30.2 (27.4-33.1)	38.7 (32.3-44.5)	955
Race/ethnicity							
Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	630
	01-02	*	< LOD	< LOD	< LOD	< LOD	262
	03-04	*	< LOD	< LOD	< LOD	23.6 (<LOD-32.5)	424
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	404
	01-02	*	< LOD	< LOD	< LOD	55.6 (<LOD-72.0)	217
	03-04	*	< LOD	< LOD	31.1 (<LOD-42.0)	42.4 (29.5-67.8)	454
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	709
	01-02	*	< LOD	< LOD	< LOD	< LOD	665
	03-04	*	< LOD	< LOD	28.0 (<LOD-30.0)	33.6 (31.1-38.8)	877

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	*	*	12
		07-08	*	*	15
		09-10	*	*	17
	40-59	05-06	9.21	1.29	12
		07-08	6.91	0.75	16
		09-10	6.15	0.35	17
60+	05-06	15.8	1.1	15	
	07-08	13.7	1.4	23	
	09-10	9.20	0.58	20	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	*	*	16
		07-08	*	*	13
		09-10	*	*	18
	40-59	05-06	10.0	1.6	13
		07-08	8.72	0.54	17
		09-10	6.35	0.49	17
60+	05-06	20.7	1.4	17	
	07-08	19.9	1.4	21	
	09-10	12.4	1	22	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	5
	20-39	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	7.96	1.02	5
		07-08	8.41	0.65	6
		09-10	4.81	0.45	7
60+	05-06	**20.7	7.7	5	
	07-08	12.0	2.3	8	
	09-10	7.13	0.65	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	5
	20-39	05-06	4.10	0.69	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	11.7	1.5	7
		07-08	10.2	1.3	8
		09-10	6.53	1.19	7
	60+	05-06	42.6	10.8	5
07-08		26.9	2.7	7	
09-10		20.1	1.8	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	9
		09-10	*	*	7
	40-59	05-06	8.36	2.32	4
		07-08	7.12	1.5	6
		09-10	6.84	0.62	7
	60+	05-06	9.23	1.8	4
07-08		12.6	1.8	5	
09-10		11.9	2.3	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	5.31	0.73	8
		09-10	*	*	10
	40-59	05-06	7.85	2.09	6
		07-08	*	*	6
		09-10	6.80	0.65	9
	60+	05-06	17.9	3.2	3
07-08		20.1	2.9	5	
09-10		12.7	1.4	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	9
	20-39	09-10	*	*	12
	40-59	09-10	7.00	0.73	11
	60+	09-10	11.0	1.8	7
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	5.78	0.58	14
	60+	09-10	13.6	1.2	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	14.7 (<LOD-18.0)	19.5 (17.4-23.0)	1709
	01-02	9.64 (8.53-10.9)	10.3 (8.80-11.7)	14.6 (12.7-16.7)	21.3 (18.0-25.5)	27.1 (22.5-32.0)	1219
	03-04	*	< LOD	10.6 (9.90-11.4)	14.6 (13.1-16.5)	18.7 (16.5-24.2)	1858
Age group 12-19 years	99-00	*	< LOD	< LOD	18.4 (16.2-20.9)	24.7 (20.9-28.1)	600
	01-02	†	†	†	†	†	†
	03-04	9.36 (8.60-10.2)	8.80 (<LOD-9.80)	13.4 (12.3-14.6)	19.3 (16.2-29.6)	33.2 (21.2-54.2)	583
20 years and older	99-00	*	< LOD	< LOD	14.2 (<LOD-17.5)	18.4 (15.0-23.8)	1109
	01-02	9.64 (8.53-10.9)	10.3 (8.80-11.7)	14.6 (12.7-16.7)	21.3 (18.0-25.5)	27.1 (22.5-32.0)	1219
	03-04	*	< LOD	10.3 (9.60-11.1)	13.8 (12.5-16.0)	18.0 (16.0-20.9)	1275
Gender Males	99-00	*	< LOD	< LOD	16.4 (<LOD-20.0)	21.0 (18.1-26.8)	815
	01-02	10.1 (8.74-11.6)	11.0 (9.30-12.6)	15.2 (12.9-17.2)	20.8 (17.2-27.8)	28.9 (22.0-34.8)	557
	03-04	*	< LOD	11.3 (10.1-12.9)	17.1 (14.3-19.1)	23.9 (18.3-30.9)	913
Females	99-00	*	< LOD	< LOD	< LOD	17.5 (14.3-20.3)	894
	01-02	9.28 (8.20-10.5)	9.40 (8.20-11.2)	14.1 (12.4-16.6)	21.3 (17.4-25.5)	26.5 (22.3-31.9)	662
	03-04	*	< LOD	9.90 (9.30-10.5)	13.0 (12.2-14.3)	16.0 (14.3-18.4)	945
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	19.7 (<LOD-25.4)	570
	01-02	7.73 (7.19-8.31)	8.20 (7.80-8.70)	11.2 (10.6-12.5)	16.5 (14.5-19.6)	20.8 (17.2-26.8)	260
	03-04	*	< LOD	9.10 (<LOD-10.6)	12.0 (10.1-16.8)	15.1 (11.6-20.0)	420
Non-Hispanic blacks	99-00	*	< LOD	< LOD	22.4 (15.2-28.2)	28.2 (26.5-29.6)	359
	01-02	12.3 (10.6-14.4)	12.8 (10.9-15.2)	17.4 (15.4-21.0)	25.5 (22.4-31.2)	32.1 (25.7-37.6)	214
	03-04	*	< LOD	11.3 (10.7-12.2)	16.1 (13.4-19.0)	20.4 (16.7-26.8)	454
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	17.5 (14.9-18.9)	636
	01-02	9.50 (8.30-10.9)	10.1 (8.40-12.0)	14.4 (12.6-16.6)	20.5 (16.9-25.5)	25.8 (20.5-31.7)	665
	03-04	*	< LOD	10.5 (9.60-11.5)	14.6 (12.9-17.4)	19.0 (16.3-26.2)	864

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 13.5, 7.0, and 8.6, respectively.

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	12.5	1.6	9
		07-08	12.0	0.8	6
		09-10	7.93	0.59	10
	20-39	05-06	7.09	0.32	12
		07-08	8.07	0.6	15
		09-10	6.63	0.54	17
	40-59	05-06	8.33	0.86	12
		07-08	7.42	0.49	16
		09-10	7.00	0.59	17
60+	05-06	8.16	0.85	15	
	07-08	7.24	0.3	23	
	09-10	6.32	0.41	21	
Non-Hispanic White Female	12-19	05-06	7.63	0.43	10
		07-08	8.52	0.32	7
		09-10	7.84	0.83	8
	20-39	05-06	6.94	0.58	16
		07-08	8.22	0.62	13
		09-10	6.26	0.84	18
	40-59	05-06	6.85	0.46	13
		07-08	7.00	0.51	17
		09-10	4.96	0.33	17
	60+	05-06	7.74	0.6	17
		07-08	8.12	0.93	21
		09-10	6.30	0.64	22
Non-Hispanic Black Male	12-19	05-06	10.8	1.2	13
		07-08	10.0	1	6
		09-10	7.62	0.66	6
	20-39	05-06	8.24	1.31	6
		07-08	7.61	0.91	6
		09-10	5.58	0.85	7
	40-59	05-06	7.85	1.02	5
		07-08	7.10	0.76	6
		09-10	6.14	0.73	7
	60+	05-06	10.6	2.5	5
		07-08	7.78	0.88	8
		09-10	5.43	0.67	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.03, 1.78, and 1.9, respectively.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	8.80	1.47	14
		07-08	8.73	1.2	5
		09-10	7.11	1.36	6
	20-39	05-06	6.20	0.58	7
		07-08	7.65	0.48	8
		09-10	5.24	0.39	7
	40-59	05-06	6.35	0.74	7
		07-08	9.30	0.8	8
		09-10	5.09	0.71	7
60+	05-06	10.5	1.2	5	
	07-08	8.95	0.94	7	
	09-10	7.45	0.9	7	
Mexican American Male	12-19	05-06	9.25	1.4	11
		07-08	8.38	0.7	6
		09-10	8.90	1.43	8
	20-39	05-06	6.57	0.48	9
		07-08	8.03	0.74	9
		09-10	7.22	1.03	8
	40-59	05-06	7.45	1.52	4
		07-08	6.77	0.23	6
		09-10	5.63	0.28	7
60+	05-06	7.18	0.99	4	
	07-08	6.15	0.38	5	
	09-10	7.47	0.7	5	
Mexican American Female	12-19	05-06	5.61	0.33	16
		07-08	8.86	0.85	5
		09-10	5.49	0.39	7
	20-39	05-06	6.00	0.4	9
		07-08	7.42	0.67	8
		09-10	6.11	0.89	10
	40-59	05-06	8.74	1.09	6
		07-08	6.36	0.69	6
		09-10	6.64	0.57	9
60+	05-06	6.28	1.42	3	
	07-08	6.56	0.63	5	
	09-10	8.50	0.7	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.03, 1.78, and 1.9, respectively.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	9.87	1.35	11
	20-39	09-10	7.48	0.8	13
	40-59	09-10	5.43	0.28	12
	60+	09-10	7.24	0.64	8
All Hispanic Female	12-19	09-10	5.81	0.38	10
	20-39	09-10	5.76	0.63	14
	40-59	09-10	6.65	0.4	14
	60+	09-10	7.04	0.81	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.03, 1.78, and 1.9, respectively.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	85.3 (<LOD-95.8)	108 (95.8-120)	1709
	01-02	62.2 (55.4-69.9)	64.5 (58.0-71.6)	94.1 (82.3-110)	134 (119-165)	181 (147-206)	1219
	03-04	*	< LOD	63.6 (59.9-67.7)	88.3 (81.0-100)	116 (101-137)	1858
Age group 12-19 years	99-00	*	< LOD	< LOD	79.3 (69.5-84.2)	102 (83.4-120)	600
	01-02	†	†	†	†	†	†
	03-04	47.5 (44.0-51.3)	43.7 (<LOD-49.3)	63.7 (59.1-72.3)	102 (85.3-114)	175 (113-222)	583
20 years and older	99-00	*	< LOD	< LOD	85.7 (<LOD-97.7)	108 (93.6-127)	1109
	01-02	62.2 (55.4-69.9)	64.5 (58.0-71.6)	94.1 (82.3-110)	134 (119-165)	181 (147-206)	1219
	03-04	*	< LOD	63.5 (59.6-67.6)	86.5 (78.8-100)	112 (94.9-135)	1275
Gender Males	99-00	*	< LOD	< LOD	91.4 (<LOD-108)	112 (99.3-133)	815
	01-02	66.3 (58.2-75.6)	70.4 (59.8-81.8)	99.3 (85.5-120)	143 (120-181)	182 (146-237)	557
	03-04	*	< LOD	69.7 (62.9-76.0)	100 (85.9-116)	135 (113-193)	913
Females	99-00	*	< LOD	< LOD	< LOD	97.8 (86.2-130)	894
	01-02	58.8 (52.0-66.4)	60.2 (53.5-67.6)	89.5 (74.7-107)	131 (108-165)	169 (131-225)	662
	03-04	*	< LOD	58.5 (54.5-62.4)	83.5 (74.7-87.7)	102 (87.7-116)	945
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	113 (<LOD-133)	570
	01-02	49.5 (46.0-53.4)	50.4 (45.7-57.2)	76.9 (67.1-82.1)	99.7 (90.9-124)	133 (94.8-202)	260
	03-04	*	< LOD	56.0 (<LOD-64.6)	74.2 (62.6-91.4)	90.5 (76.4-107)	420
Non-Hispanic blacks	99-00	*	< LOD	< LOD	117 (89.0-143)	153 (109-197)	359
	01-02	72.6 (61.9-85.2)	70.9 (62.4-85.2)	107 (91.5-128)	147 (131-177)	193 (154-259)	214
	03-04	*	< LOD	66.2 (60.2-75.5)	91.3 (80.3-112)	119 (102-151)	454
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	97.7 (89.3-104)	636
	01-02	61.8 (54.3-70.4)	65.4 (57.4-72.2)	94.3 (78.1-112)	133 (114-166)	180 (137-222)	665
	03-04	*	< LOD	63.9 (59.6-69.2)	87.8 (79.8-100)	116 (102-139)	864

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	68.5	9.8	9
		07-08	59.8	4.7	6
		09-10	42.3	3.3	10
	20-39	05-06	51.2	3.2	12
		07-08	52.5	3.2	15
		09-10	43.1	3.4	17
	40-59	05-06	63.0	7.1	12
		07-08	54.3	3.3	16
		09-10	47.1	3.6	17
60+	05-06	55.4	5.5	15	
	07-08	46.4	1.9	23	
	09-10	38.4	2.5	21	
Non-Hispanic White Female	12-19	05-06	40.7	2.6	10
		07-08	40.0	2.2	7
		09-10	37.5	4.3	8
	20-39	05-06	45.0	3.8	16
		07-08	49.0	4	13
		09-10	33.4	4.6	18
	40-59	05-06	50.3	3.7	13
		07-08	46.4	3.8	17
		09-10	31.3	2.1	17
	60+	05-06	56.3	4.2	17
		07-08	54.4	6.1	21
		09-10	38.5	4	22
Non-Hispanic Black Male	12-19	05-06	54.8	6.7	13
		07-08	47.2	3.9	6
		09-10	34.8	3.6	6
	20-39	05-06	49.7	9.1	6
		07-08	42.9	5.2	6
		09-10	30.6	3.9	7
	40-59	05-06	50.1	6.7	5
		07-08	45.3	4.5	6
		09-10	37.9	4.8	7
	60+	05-06	62.2	13.6	5
		07-08	46.9	5.3	8
		09-10	28.8	3.1	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	43.4	7.2	14
		07-08	41.9	7.2	5
		09-10	31.0	5.4	6
	20-39	05-06	35.6	3.3	7
		07-08	38.7	2.7	8
		09-10	25.7	1.7	7
	40-59	05-06	40.3	4.1	7
		07-08	55.7	4.9	8
		09-10	28.8	4.2	7
	60+	05-06	69.9	7.9	5
07-08		53.5	4.3	7	
09-10		42.7	5.3	7	
Mexican American Male	12-19	05-06	49.7	7.2	11
		07-08	44.5	3.8	6
		09-10	41.5	6.2	8
	20-39	05-06	46.5	3.4	9
		07-08	54.2	4.6	9
		09-10	43.2	5.4	8
	40-59	05-06	59.9	11.2	4
		07-08	48.4	3.7	6
		09-10	39.9	2.3	7
	60+	05-06	50.8	4.8	4
07-08		44.3	3.1	5	
09-10		45.9	4.2	5	
Mexican American Female	12-19	05-06	30.5	1.6	16
		07-08	43.7	4.8	5
		09-10	25.6	1.6	7
	20-39	05-06	39.8	2.8	9
		07-08	42.4	3	8
		09-10	32.6	4.4	10
	40-59	05-06	64.2	7.8	6
		07-08	42.8	5	6
		09-10	41.8	2.7	9
	60+	05-06	**49.6	15.4	3
07-08		45.1	4.9	5	
09-10		47.0	2.6	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	45.9	6.2	11
	20-39	09-10	45.9	4.1	13
	40-59	09-10	37.5	2	12
	60+	09-10	46.4	5.3	8
All Hispanic Female	12-19	09-10	26.8	1.7	10
	20-39	09-10	31.1	3.2	14
	40-59	09-10	41.0	1.9	14
	60+	09-10	41.1	4.1	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF) (lipid adjusted) (2001 – 2004)

Geometric mean and selected percentiles of serum concentrations (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	01-02	*	< LOD	< LOD	< LOD	< LOD	1224
	03-04	*	< LOD	< LOD	< LOD	< LOD	1852
Age group							
12-19 years	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	< LOD	< LOD	583
20 years and older	01-02	*	< LOD	< LOD	< LOD	< LOD	1224
	03-04	*	< LOD	< LOD	< LOD	< LOD	1269
Gender							
Males	01-02	*	< LOD	< LOD	< LOD	< LOD	558
	03-04	*	< LOD	< LOD	< LOD	< LOD	908
Females	01-02	*	< LOD	< LOD	< LOD	< LOD	666
	03-04	*	< LOD	< LOD	< LOD	< LOD	944
Race/ethnicity							
Mexican Americans	01-02	*	< LOD	< LOD	< LOD	< LOD	262
	03-04	*	< LOD	< LOD	< LOD	< LOD	423
Non-Hispanic blacks	01-02	*	< LOD	< LOD	< LOD	< LOD	217
	03-04	*	< LOD	< LOD	< LOD	< LOD	452
Non-Hispanic whites	01-02	*	< LOD	< LOD	< LOD	< LOD	661
	03-04	*	< LOD	< LOD	< LOD	< LOD	856

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02 and 03-04 are 7.0 and 8.6.

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	*	*	12
		07-08	*	*	15
		09-10	*	*	17
	40-59	05-06	*	*	12
		07-08	*	*	16
		09-10	*	*	14
60+	05-06	*	*	15	
	07-08	*	*	23	
	09-10	*	*	19	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	7
	20-39	05-06	*	*	16
		07-08	*	*	13
		09-10	*	*	18
	40-59	05-06	*	*	13
		07-08	*	*	17
		09-10	*	*	17
60+	05-06	*	*	17	
	07-08	*	*	21	
	09-10	*	*	22	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	5
	20-39	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	*	*	5
		07-08	*	*	6
		09-10	*	*	7
60+	05-06	*	*	5	
	07-08	*	*	8	
	09-10	*	*	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.19, 0.33, and 0.35, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
60+	05-06	*	*	5	
	07-08	*	*	7	
	09-10	*	*	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	*	*	9
		07-08	*	*	9
		09-10	*	*	8
	40-59	05-06	*	*	4
		07-08	*	*	6
		09-10	*	*	7
60+	05-06	*	*	4	
	07-08	*	*	5	
	09-10	*	*	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	8
		09-10	*	*	8
	40-59	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	9
60+	05-06	*	*	3	
	07-08	*	*	5	
	09-10	*	*	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.19, 0.33, and 0.35, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	*	*	13
	40-59	09-10	*	*	12
	60+	09-10	*	*	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	12
	40-59	09-10	*	*	14
	60+	09-10	*	*	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.19, 0.33, and 0.35, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF) (whole weight) (2001 – 2004)

Geometric mean and selected percentiles of serum concentrations (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	01-02	*	< LOD	< LOD	< LOD	< LOD	1224
	03-04	*	< LOD	< LOD	< LOD	< LOD	1852
Age group							
12-19 years	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	< LOD	< LOD	583
20 years and older	01-02	*	< LOD	< LOD	< LOD	< LOD	1224
	03-04	*	< LOD	< LOD	< LOD	< LOD	1269
Gender							
Males	01-02	*	< LOD	< LOD	< LOD	< LOD	558
	03-04	*	< LOD	< LOD	< LOD	< LOD	908
Females	01-02	*	< LOD	< LOD	< LOD	< LOD	666
	03-04	*	< LOD	< LOD	< LOD	< LOD	944
Race/ethnicity							
Mexican Americans	01-02	*	< LOD	< LOD	< LOD	< LOD	262
	03-04	*	< LOD	< LOD	< LOD	< LOD	423
Non-Hispanic blacks	01-02	*	< LOD	< LOD	< LOD	< LOD	217
	03-04	*	< LOD	< LOD	< LOD	< LOD	452
Non-Hispanic whites	01-02	*	< LOD	< LOD	< LOD	< LOD	661
	03-04	*	< LOD	< LOD	< LOD	< LOD	856

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	*	*	12
		07-08	*	*	15
		09-10	*	*	17
	40-59	05-06	*	*	12
		07-08	*	*	16
		09-10	*	*	14
60+	05-06	*	*	15	
	07-08	*	*	23	
	09-10	*	*	19	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	7
	20-39	05-06	*	*	16
		07-08	*	*	13
		09-10	*	*	18
	40-59	05-06	*	*	13
		07-08	*	*	17
		09-10	*	*	17
60+	05-06	*	*	17	
	07-08	*	*	21	
	09-10	*	*	22	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	5
	20-39	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	*	*	5
		07-08	*	*	6
		09-10	*	*	7
60+	05-06	*	*	5	
	07-08	*	*	8	
	09-10	*	*	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
60+	05-06	*	*	5	
	07-08	*	*	7	
	09-10	*	*	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	*	*	9
		07-08	*	*	9
		09-10	*	*	8
	40-59	05-06	*	*	4
		07-08	*	*	6
		09-10	*	*	7
60+	05-06	*	*	4	
	07-08	*	*	5	
	09-10	*	*	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	8
		09-10	*	*	8
	40-59	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	9
60+	05-06	*	*	3	
	07-08	*	*	5	
	09-10	*	*	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	*	*	13
	40-59	09-10	*	*	12
	60+	09-10	*	*	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	12
	40-59	09-10	*	*	14
	60+	09-10	*	*	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1890
	01-02	*	< LOD	8.00 (6.90-9.60)	12.1 (9.40-14.9)	15.4 (12.9-18.6)	1223
	03-04	*	< LOD	< LOD	7.50 (<LOD-7.90)	8.90 (7.90-10.2)	1866
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	657
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	< LOD	< LOD	583
20 years and older	99-00	*	< LOD	< LOD	< LOD	12.8 (<LOD-14.5)	1233
	01-02	*	< LOD	8.00 (6.90-9.60)	12.1 (9.40-14.9)	15.4 (12.9-18.6)	1223
	03-04	*	< LOD	< LOD	7.60 (<LOD-8.20)	9.50 (8.00-10.5)	1283
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	908
	01-02	*	< LOD	8.20 (7.10-10.0)	12.8 (9.50-15.9)	15.9 (12.2-20.9)	562
	03-04	*	< LOD	< LOD	7.40 (<LOD-8.00)	8.50 (7.80-10.0)	916
Females	99-00	*	< LOD	< LOD	< LOD	12.9 (<LOD-16.4)	982
	01-02	*	< LOD	7.90 (6.70-9.00)	11.7 (9.40-13.8)	14.5 (12.2-18.6)	661
	03-04	*	< LOD	< LOD	7.50 (<LOD-8.40)	9.30 (7.80-10.4)	950
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	631
	01-02	*	< LOD	< LOD	7.30 (<LOD-8.00)	8.00 (7.00-10.9)	261
	03-04	*	< LOD	< LOD	< LOD	< LOD	423
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	14.3 (<LOD-15.1)	399
	01-02	*	< LOD	8.90 (7.70-10.1)	13.6 (11.1-17.1)	18.6 (14.6-22.6)	214
	03-04	*	< LOD	< LOD	7.80 (<LOD-10.9)	10.9 (7.50-19.4)	453
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	703
	01-02	*	< LOD	8.30 (7.10-10.2)	12.5 (10.0-15.9)	15.9 (13.1-19.0)	664
	03-04	*	< LOD	< LOD	7.60 (<LOD-8.10)	9.40 (8.00-10.2)	869

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 12.7, 6.5, and 7.4, respectively.

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	2.18	0.17	9
		07-08	2.58	0.24	6
		09-10	2.03	0.13	10
	20-39	05-06	2.51	0.29	12
		07-08	3.13	0.17	15
		09-10	2.50	0.13	17
	40-59	05-06	4.55	0.3	12
		07-08	3.78	0.14	16
		09-10	4.11	0.28	17
60+	05-06	5.40	0.45	15	
	07-08	4.80	0.21	23	
	09-10	4.34	0.25	20	
Non-Hispanic White Female	12-19	05-06	1.71	0.15	10
		07-08	1.74	0.14	7
		09-10	1.61	0.16	8
	20-39	05-06	2.36	0.1	16
		07-08	2.29	0.11	13
		09-10	2.09	0.09	18
	40-59	05-06	3.58	0.18	13
		07-08	3.24	0.16	17
		09-10	2.77	0.14	17
	60+	05-06	5.54	0.34	17
		07-08	5.29	0.31	21
		09-10	4.06	0.46	14
Non-Hispanic Black Male	12-19	05-06	1.79	0.17	13
		07-08	1.83	0.15	6
		09-10	1.45	0.11	6
	20-39	05-06	2.61	0.23	6
		07-08	2.68	0.13	6
		09-10	1.59	0.21	7
	40-59	05-06	3.33	0.33	5
		07-08	3.69	0.53	6
		09-10	2.52	0.19	7
	60+	05-06	5.35	0.88	5
		07-08	4.49	0.44	8
		09-10	3.36	0.25	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.3, 0.51, and 0.55, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	1.25	0.15	14
		07-08	1.53	0.18	5
		09-10	1.46	0.21	6
	20-39	05-06	2.14	0.13	7
		07-08	2.12	0.43	8
		09-10	1.76	0.17	7
	40-59	05-06	3.37	0.37	7
		07-08	3.61	0.41	8
		09-10	2.94	0.29	7
60+	05-06	8.98	1.22	5	
	07-08	6.88	0.72	7	
	09-10	6.00	0.67	7	
Mexican American Male	12-19	05-06	1.67	0.12	11
		07-08	1.30	0.36	6
		09-10	1.74	0.19	8
	20-39	05-06	2.29	0.22	9
		07-08	2.63	0.22	9
		09-10	2.52	0.23	8
	40-59	05-06	3.28	0.58	4
		07-08	2.97	0.24	6
		09-10	2.94	0.19	7
60+	05-06	4.09	0.28	4	
	07-08	3.41	0.23	5	
	09-10	5.04	0.47	5	
Mexican American Female	12-19	05-06	1.30	0.05	16
		07-08	*	*	5
		09-10	1.10	0.07	7
	20-39	05-06	1.83	0.17	9
		07-08	2.06	0.12	8
		09-10	1.60	0.24	10
	40-59	05-06	3.15	0.22	6
		07-08	2.71	0.23	6
		09-10	2.74	0.17	9
60+	05-06	4.45	0.38	3	
	07-08	4.64	0.44	5	
	09-10	4.68	0.44	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.3, 0.51, and 0.55, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	1.73	0.14	11
	20-39	09-10	2.28	0.19	13
	40-59	09-10	2.88	0.13	12
	60+	09-10	4.30	0.47	8
All Hispanic Female	12-19	09-10	1.19	0.08	10
	20-39	09-10	1.65	0.17	14
	40-59	09-10	2.75	0.14	14
	60+	09-10	4.35	0.28	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.3, 0.51, and 0.55, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1890
	01-02	*	< LOD	54.0 (46.5-63.6)	82.3 (65.5-104)	108 (88.0-138)	1223
	03-04	*	< LOD	< LOD	49.1 (<LOD-54.5)	60.1 (53.4-68.8)	1866
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	657
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	< LOD	< LOD	583
20 years and older	99-00	*	< LOD	< LOD	< LOD	84.2 (<LOD-97.2)	1233
	01-02	*	< LOD	54.0 (46.5-63.6)	82.3 (65.5-104)	108 (88.0-138)	1223
	03-04	*	< LOD	< LOD	51.0 (<LOD-57.2)	62.2 (56.2-72.7)	1283
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	908
	01-02	*	< LOD	56.9 (48.6-71.4)	90.1 (71.1-108)	108 (87.4-144)	562
	03-04	*	< LOD	< LOD	49.3 (<LOD-54.9)	59.3 (52.9-68.8)	916
Females	99-00	*	< LOD	< LOD	< LOD	82.8 (<LOD-102)	982
	01-02	*	< LOD	51.6 (43.7-59.6)	76.1 (62.6-97.0)	105 (81.6-140)	661
	03-04	*	< LOD	< LOD	48.9 (<LOD-57.2)	61.9 (53.3-72.7)	950
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	631
	01-02	*	< LOD	< LOD	48.4 (<LOD-56.3)	65.3 (48.6-79.4)	261
	03-04	*	< LOD	< LOD	< LOD	< LOD	423
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	90.8 (<LOD-105)	399
	01-02	*	< LOD	52.7 (45.0-62.7)	87.1 (63.7-108)	122 (85.2-147)	214
	03-04	*	< LOD	< LOD	56.9 (<LOD-71.7)	71.7 (53.8-112)	453
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	703
	01-02	*	< LOD	56.0 (48.6-66.1)	84.2 (64.5-115)	112 (88.6-142)	664
	03-04	*	< LOD	< LOD	50.6 (<LOD-56.3)	61.4 (54.0-71.8)	869

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	12.1	1.1	9
		07-08	12.9	1.2	6
		09-10	10.8	0.7	10
	20-39	05-06	18.1	2.4	12
		07-08	20.8	1.5	15
		09-10	16.5	1.1	17
	40-59	05-06	34.3	2.6	12
		07-08	27.9	1.2	16
		09-10	27.6	1.7	17
60+	05-06	36.8	2.8	15	
	07-08	30.6	1.2	23	
	09-10	26.3	1.5	20	
Non-Hispanic White Female	12-19	05-06	9.07	0.73	10
		07-08	8.11	0.64	7
		09-10	7.66	0.78	8
	20-39	05-06	15.3	0.8	16
		07-08	13.7	0.8	13
		09-10	11.1	0.6	18
	40-59	05-06	26.5	1.9	13
		07-08	21.4	1.1	17
		09-10	17.5	1	17
	60+	05-06	40.4	2.4	17
		07-08	35.5	2.2	21
		09-10	24.9	2.4	14
Non-Hispanic Black Male	12-19	05-06	9.18	0.88	13
		07-08	8.65	0.7	6
		09-10	6.66	0.66	6
	20-39	05-06	15.5	1.5	6
		07-08	15.2	1	6
		09-10	8.85	0.97	7
	40-59	05-06	21.2	2.1	5
		07-08	23.7	3.5	6
		09-10	15.6	1.2	7
	60+	05-06	31.5	4.4	5
		07-08	27.0	2.6	8
		09-10	17.9	1.2	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	6.19	0.73	14
		07-08	7.18	0.67	5
		09-10	6.41	0.83	6
	20-39	05-06	12.2	0.7	7
		07-08	10.9	2.3	8
		09-10	8.70	0.83	7
	40-59	05-06	21.5	2.4	7
		07-08	21.8	2.8	8
		09-10	16.6	1.8	7
	60+	05-06	60.0	7.8	5
07-08		41.1	3.3	7	
09-10		34.1	3.4	7	
Mexican American Male	12-19	05-06	9.02	0.49	11
		07-08	**7.21	2.2	6
		09-10	8.26	1.07	8
	20-39	05-06	16.0	1.1	9
		07-08	18.0	1.9	9
		09-10	15.5	1.8	8
	40-59	05-06	27.2	5.9	4
		07-08	21.4	2.6	6
		09-10	20.9	1.6	7
	60+	05-06	29.3	0.9	4
07-08		24.4	0.9	5	
09-10		31.0	2.7	5	
Mexican American Female	12-19	05-06	7.08	0.27	16
		07-08	*	*	5
		09-10	5.13	0.3	7
	20-39	05-06	12.2	1.2	9
		07-08	11.9	0.9	8
		09-10	8.62	1.27	10
	40-59	05-06	23.3	2.1	6
		07-08	18.2	1.5	6
		09-10	17.4	1	9
	60+	05-06	34.2	5.3	3
07-08		31.9	3.5	5	
09-10		25.7	1.7	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	8.13	0.78	11
	20-39	09-10	14.5	1.5	13
	40-59	09-10	20.0	1.2	12
	60+	09-10	26.9	2.7	8
All Hispanic Female	12-19	09-10	5.51	0.35	10
	20-39	09-10	9.02	0.91	14
	40-59	09-10	17.1	0.8	14
	60+	09-10	25.6	1.1	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1898
	01-02	*	< LOD	7.10 (<LOD-8.20)	10.4 (9.00-13.1)	14.0 (11.0-17.1)	1236
	03-04	*	< LOD	< LOD	< LOD	8.80 (<LOD-9.80)	1868
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	656
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	< LOD	< LOD	585
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1242
	01-02	*	< LOD	7.10 (<LOD-8.20)	10.4 (9.00-13.1)	14.0 (11.0-17.1)	1236
	03-04	*	< LOD	< LOD	< LOD	9.00 (8.00-10.1)	1283
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	913
	01-02	*	< LOD	7.10 (<LOD-8.60)	11.3 (8.50-13.8)	15.1 (11.3-18.7)	566
	03-04	*	< LOD	< LOD	< LOD	9.10 (7.90-10.8)	918
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	985
	01-02	*	< LOD	7.00 (6.20-8.00)	10.0 (9.20-11.4)	13.1 (10.5-15.6)	670
	03-04	*	< LOD	< LOD	< LOD	8.50 (<LOD-9.20)	950
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	625
	01-02	*	< LOD	< LOD	< LOD	6.90 (<LOD-11.1)	262
	03-04	*	< LOD	< LOD	< LOD	< LOD	423
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	408
	01-02	*	< LOD	7.60 (6.10-9.10)	12.1 (10.0-14.1)	16.0 (12.3-21.0)	219
	03-04	*	< LOD	< LOD	< LOD	8.50 (<LOD-12.1)	453
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	708
	01-02	*	< LOD	7.40 (6.20-9.00)	10.7 (9.20-14.3)	14.8 (11.6-17.2)	670
	03-04	*	< LOD	< LOD	< LOD	9.10 (8.00-10.6)	871

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 12.6, 6.1, and 7.9, respectively.

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	2.46	0.17	9
		07-08	3.09	0.14	6
		09-10	2.21	0.1	10
	20-39	05-06	2.68	0.31	12
		07-08	2.98	0.19	15
		09-10	2.71	0.12	17
	40-59	05-06	4.91	0.42	12
		07-08	3.97	0.18	16
		09-10	4.62	0.36	17
60+	05-06	5.44	0.36	15	
	07-08	4.82	0.21	23	
	09-10	4.41	0.29	21	
Non-Hispanic White Female	12-19	05-06	1.91	0.12	10
		07-08	1.68	0.36	7
		09-10	1.70	0.15	8
	20-39	05-06	2.43	0.11	16
		07-08	2.44	0.12	13
		09-10	2.30	0.12	18
	40-59	05-06	3.68	0.2	13
		07-08	3.30	0.15	17
		09-10	3.08	0.15	17
60+	05-06	5.51	0.31	17	
	07-08	5.04	0.28	21	
	09-10	4.58	0.29	22	
Non-Hispanic Black Male	12-19	05-06	1.81	0.19	13
		07-08	1.98	0.22	6
		09-10	1.62	0.11	6
	20-39	05-06	2.28	0.19	6
		07-08	2.32	0.16	6
		09-10	1.66	0.23	7
	40-59	05-06	3.00	0.32	5
		07-08	3.42	0.36	6
		09-10	2.68	0.19	7
60+	05-06	5.27	0.86	5	
	07-08	4.38	0.36	8	
	09-10	3.73	0.34	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.1, 0.18, and 0.19, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	1.26	0.18	14
		07-08	**1.19	0.36	5
		09-10	1.57	0.23	6
	20-39	05-06	2.02	0.1	7
		07-08	2.15	0.21	8
		09-10	1.80	0.12	7
	40-59	05-06	2.97	0.34	7
		07-08	3.17	0.26	8
		09-10	2.93	0.33	7
	60+	05-06	7.44	0.97	5
07-08		5.96	0.52	7	
09-10		5.43	0.47	7	
Mexican American Male	12-19	05-06	1.68	0.26	11
		07-08	1.80	0.34	6
		09-10	1.99	0.24	8
	20-39	05-06	2.25	0.28	9
		07-08	2.05	0.38	9
		09-10	2.49	0.32	8
	40-59	05-06	3.18	0.44	4
		07-08	3.00	0.22	6
		09-10	2.95	0.19	7
	60+	05-06	4.31	0.37	4
07-08		3.93	0.3	5	
09-10		4.80	0.31	5	
Mexican American Female	12-19	05-06	1.42	0.07	16
		07-08	*	*	5
		09-10	1.47	0.06	7
	20-39	05-06	1.87	0.19	9
		07-08	2.13	0.13	8
		09-10	1.76	0.26	10
	40-59	05-06	2.88	0.13	6
		07-08	2.82	0.38	6
		09-10	2.88	0.21	9
	60+	05-06	4.10	0.35	3
07-08		4.69	0.54	5	
09-10		4.61	0.4	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.1, 0.18, and 0.19, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	1.97	0.2	11
	20-39	09-10	2.25	0.22	13
	40-59	09-10	2.93	0.16	12
	60+	09-10	4.19	0.36	8
All Hispanic Female	12-19	09-10	1.48	0.08	10
	20-39	09-10	1.78	0.19	14
	40-59	09-10	2.91	0.16	14
	60+	09-10	4.27	0.25	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.1, 0.18, and 0.19, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1898
	01-02	*	< LOD	46.2 (<LOD-56.5)	70.3 (58.4-90.7)	101 (77.6-120)	1236
	03-04	*	< LOD	< LOD	< LOD	59.8 (<LOD-65.4)	1868
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	656
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	< LOD	< LOD	585
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1242
	01-02	*	< LOD	46.2 (<LOD-56.5)	70.3 (58.4-90.7)	101 (77.6-120)	1236
	03-04	*	< LOD	< LOD	< LOD	61.0 (57.6-65.7)	1283
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	913
	01-02	*	< LOD	47.9 (<LOD-60.5)	72.3 (57.5-105)	104 (73.5-133)	566
	03-04	*	< LOD	< LOD	< LOD	61.0 (54.0-67.7)	918
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	985
	01-02	*	< LOD	45.0 (37.0-54.3)	66.2 (58.3-79.1)	90.7 (71.9-115)	670
	03-04	*	< LOD	< LOD	< LOD	58.1 (<LOD-65.0)	950
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	625
	01-02	*	< LOD	< LOD	< LOD	52.7 (<LOD-65.9)	262
	03-04	*	< LOD	< LOD	< LOD	< LOD	423
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	408
	01-02	*	< LOD	44.4 (37.2-57.3)	71.5 (59.8-90.9)	107 (70.7-142)	219
	03-04	*	< LOD	< LOD	< LOD	58.4 (<LOD-73.0)	453
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	708
	01-02	*	< LOD	49.6 (41.9-57.9)	72.8 (58.4-102)	103 (82.6-121)	670
	03-04	*	< LOD	< LOD	< LOD	63.4 (57.3-67.7)	871

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	13.5	1.1	9
		07-08	15.4	0.5	6
		09-10	11.8	0.7	10
	20-39	05-06	19.4	2.6	12
		07-08	19.8	1.5	15
		09-10	17.8	1	17
	40-59	05-06	37.2	3.6	12
		07-08	29.1	1.2	16
		09-10	31.0	2.1	17
60+	05-06	37.0	2.2	15	
	07-08	30.7	1.1	23	
	09-10	26.7	1.7	21	
Non-Hispanic White Female	12-19	05-06	10.1	0.6	10
		07-08	7.82	1.67	7
		09-10	8.12	0.79	8
	20-39	05-06	15.8	0.8	16
		07-08	14.6	0.8	13
		09-10	12.2	0.7	18
	40-59	05-06	27.2	1.9	13
		07-08	21.8	1.1	17
		09-10	19.4	0.9	17
	60+	05-06	40.2	2.3	17
		07-08	33.8	2	21
		09-10	27.5	1.4	22
Non-Hispanic Black Male	12-19	05-06	9.30	0.95	13
		07-08	9.32	0.9	6
		09-10	7.39	0.63	6
	20-39	05-06	13.6	1.3	6
		07-08	13.1	1.2	6
		09-10	9.30	1.16	7
	40-59	05-06	19.1	2.1	5
		07-08	21.8	2.1	6
		09-10	16.5	1.3	7
	60+	05-06	31.3	5	5
		07-08	26.4	2.1	8
		09-10	19.9	1.7	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	6.16	0.89	14
		07-08	5.62	1.68	5
		09-10	6.89	0.9	6
	20-39	05-06	11.6	0.4	7
		07-08	10.9	1.2	8
		09-10	8.85	0.57	7
	40-59	05-06	19.1	2.3	7
		07-08	19.2	2	8
		09-10	16.5	1.9	7
	60+	05-06	49.5	5.8	5
07-08		35.7	2	7	
09-10		30.9	2.2	7	
Mexican American Male	12-19	05-06	8.94	1.33	11
		07-08	9.32	1.79	6
		09-10	9.38	1.25	8
	20-39	05-06	15.7	1.5	9
		07-08	13.9	2.6	9
		09-10	15.5	2.4	8
	40-59	05-06	26.1	4.6	4
		07-08	21.6	2.5	6
		09-10	20.9	1.4	7
	60+	05-06	30.8	1.2	4
07-08		28.4	2.6	5	
09-10		29.5	1.8	5	
Mexican American Female	12-19	05-06	7.68	0.31	16
		07-08	*	*	5
		09-10	6.84	0.19	7
	20-39	05-06	12.5	1.4	9
		07-08	12.2	0.6	8
		09-10	9.42	1.41	10
	40-59	05-06	21.3	1.5	6
		07-08	19.0	2.6	6
		09-10	18.2	0.9	9
	60+	05-06	31.5	5	3
07-08		32.3	4.2	5	
09-10		25.4	1.5	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	9.25	1.04	11
	20-39	09-10	14.4	1.7	13
	40-59	09-10	20.3	1.2	12
	60+	09-10	26.3	2	8
All Hispanic Female	12-19	09-10	6.86	0.32	10
	20-39	09-10	9.67	1	14
	40-59	09-10	18.0	0.8	14
	60+	09-10	25.1	0.9	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1875
	01-02	*	< LOD	< LOD	< LOD	< LOD	1223
	03-04	*	< LOD	< LOD	< LOD	< LOD	1864
Age group							
12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	645
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	< LOD	< LOD	583
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1230
	01-02	*	< LOD	< LOD	< LOD	< LOD	1223
	03-04	*	< LOD	< LOD	< LOD	< LOD	1281
Gender							
Males	99-00	*	< LOD	< LOD	< LOD	< LOD	894
	01-02	*	< LOD	< LOD	< LOD	< LOD	559
	03-04	*	< LOD	< LOD	< LOD	< LOD	914
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	981
	01-02	*	< LOD	< LOD	< LOD	< LOD	664
	03-04	*	< LOD	< LOD	< LOD	< LOD	950
Race/ethnicity							
Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	620
	01-02	*	< LOD	< LOD	< LOD	< LOD	261
	03-04	*	< LOD	< LOD	< LOD	< LOD	423
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	400
	01-02	*	< LOD	< LOD	< LOD	< LOD	216
	03-04	*	< LOD	< LOD	< LOD	< LOD	454
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	699
	01-02	*	< LOD	< LOD	< LOD	< LOD	665
	03-04	*	< LOD	< LOD	< LOD	< LOD	866

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 12.7, 6.0, and 8.3, respectively.

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	*	*	12
		07-08	*	*	15
		09-10	*	*	17
	40-59	05-06	*	*	12
		07-08	*	*	16
		09-10	*	*	15
60+	05-06	*	*	15	
	07-08	*	*	23	
	09-10	*	*	20	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	*	*	16
		07-08	*	*	13
		09-10	*	*	18
	40-59	05-06	*	*	13
		07-08	*	*	17
		09-10	*	*	17
60+	05-06	*	*	17	
	07-08	*	*	21	
	09-10	*	*	14	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	6
	20-39	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	*	*	5
		07-08	*	*	6
		09-10	*	*	7
60+	05-06	*	*	5	
	07-08	*	*	8	
	09-10	*	*	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.2, 0.35, and 0.37, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
	60+	05-06	*	*	5
07-08		*	*	7	
09-10		*	*	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	*	*	9
		07-08	*	*	9
		09-10	*	*	8
	40-59	05-06	*	*	4
		07-08	*	*	6
		09-10	*	*	7
	60+	05-06	*	*	4
07-08		*	*	5	
09-10		*	*	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	8
		09-10	*	*	10
	40-59	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	9
	60+	05-06	*	*	3
07-08		*	*	5	
09-10		*	*	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.2, 0.35, and 0.37, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	*	*	13
	40-59	09-10	*	*	12
	60+	09-10	*	*	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	*	*	14
	60+	09-10	*	*	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.2, 0.35, and 0.37, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1875
	01-02	*	< LOD	< LOD	< LOD	< LOD	1223
	03-04	*	< LOD	< LOD	< LOD	< LOD	1864
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	645
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	< LOD	< LOD	583
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1230
	01-02	*	< LOD	< LOD	< LOD	< LOD	1223
	03-04	*	< LOD	< LOD	< LOD	< LOD	1281
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	894
	01-02	*	< LOD	< LOD	< LOD	< LOD	559
	03-04	*	< LOD	< LOD	< LOD	< LOD	914
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	981
	01-02	*	< LOD	< LOD	< LOD	< LOD	664
	03-04	*	< LOD	< LOD	< LOD	< LOD	950
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	620
	01-02	*	< LOD	< LOD	< LOD	< LOD	261
	03-04	*	< LOD	< LOD	< LOD	< LOD	423
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	400
	01-02	*	< LOD	< LOD	< LOD	< LOD	216
	03-04	*	< LOD	< LOD	< LOD	< LOD	454
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	699
	01-02	*	< LOD	< LOD	< LOD	< LOD	665
	03-04	*	< LOD	< LOD	< LOD	< LOD	866

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	*	*	12
		07-08	*	*	15
		09-10	*	*	17
	40-59	05-06	*	*	12
		07-08	*	*	16
		09-10	*	*	15
	60+	05-06	*	*	15
		07-08	*	*	23
		09-10	*	*	20
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	*	*	16
		07-08	*	*	13
		09-10	*	*	18
	40-59	05-06	*	*	13
		07-08	*	*	17
		09-10	*	*	17
	60+	05-06	*	*	17
		07-08	*	*	21
		09-10	*	*	14
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	6
	20-39	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	*	*	5
		07-08	*	*	6
		09-10	*	*	7
	60+	05-06	*	*	5
		07-08	*	*	8
		09-10	*	*	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
	60+	05-06	*	*	5
07-08		*	*	7	
09-10		*	*	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	*	*	9
		07-08	*	*	9
		09-10	*	*	8
	40-59	05-06	*	*	4
		07-08	*	*	6
		09-10	*	*	7
	60+	05-06	*	*	4
07-08		*	*	5	
09-10		*	*	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	8
		09-10	*	*	10
	40-59	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	9
	60+	05-06	*	*	3
07-08		*	*	5	
09-10		*	*	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	*	*	13
	40-59	09-10	*	*	12
	60+	09-10	*	*	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	*	*	14
	60+	09-10	*	*	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1884
	01-02	*	< LOD	< LOD	< LOD	< LOD	1230
	03-04	*	< LOD	< LOD	< LOD	< LOD	1866
Age group							
12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	652
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	< LOD	< LOD	584
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1232
	01-02	*	< LOD	< LOD	< LOD	< LOD	1230
	03-04	*	< LOD	< LOD	< LOD	< LOD	1282
Gender							
Males	99-00	*	< LOD	< LOD	< LOD	< LOD	900
	01-02	*	< LOD	< LOD	< LOD	< LOD	565
	03-04	*	< LOD	< LOD	< LOD	< LOD	916
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	984
	01-02	*	< LOD	< LOD	< LOD	< LOD	665
	03-04	*	< LOD	< LOD	< LOD	< LOD	950
Race/ethnicity							
Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	614
	01-02	*	< LOD	< LOD	< LOD	< LOD	260
	03-04	*	< LOD	< LOD	< LOD	< LOD	422
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	408
	01-02	*	< LOD	< LOD	< LOD	< LOD	218
	03-04	*	< LOD	< LOD	< LOD	< LOD	454
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	704
	01-02	*	< LOD	< LOD	< LOD	< LOD	671
	03-04	*	< LOD	< LOD	< LOD	< LOD	869

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 12.9, 5.8, and 8.2, respectively.

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	.555	0.142	9
		07-08	*	*	6
		09-10	.743	0.084	10
	20-39	05-06	.882	0.14	12
		07-08	.782	0.172	15
		09-10	.960	0.086	17
	40-59	05-06	1.40	0.17	12
		07-08	1.08	0.14	16
		09-10	1.38	0.11	17
60+	05-06	1.31	0.07	15	
	07-08	1.09	0.14	23	
	09-10	1.19	0.09	21	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	.685	0.097	8
	20-39	05-06	.714	0.087	16
		07-08	*	*	13
		09-10	.910	0.056	18
	40-59	05-06	1.00	0.13	13
		07-08	*	*	17
		09-10	1.00	0.08	17
60+	05-06	1.18	0.07	17	
	07-08	.803	0.127	21	
	09-10	1.01	0.06	22	
Non-Hispanic Black Male	12-19	05-06	.418	0.081	13
		07-08	*	*	6
		09-10	.404	0.093	6
	20-39	05-06	**1.23	0.68	6
		07-08	*	*	6
		09-10	.648	0.099	7
	40-59	05-06	.794	0.114	5
		07-08	.650	0.182	6
		09-10	.677	0.142	6
60+	05-06	.969	0.082	5	
	07-08	.699	0.2	8	
	09-10	.750	0.05	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.11, 0.2, and 0.21, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	.540	0.125	6
	20-39	05-06	.528	0.108	7
		07-08	*	*	8
		09-10	.601	0.079	7
	40-59	05-06	.773	0.099	7
		07-08	*	*	8
		09-10	.821	0.158	7
60+	05-06	1.11	0.18	5	
	07-08	*	*	7	
	09-10	.955	0.139	6	
Mexican American Male	12-19	05-06	.481	0.12	11
		07-08	*	*	6
		09-10	.836	0.099	8
	20-39	05-06	.825	0.155	9
		07-08	*	*	9
		09-10	1.13	0.15	8
	40-59	05-06	1.15	0.17	4
		07-08	*	*	6
		09-10	1.08	0.1	7
60+	05-06	1.16	0.16	4	
	07-08	*	*	5	
	09-10	1.52	0.09	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	.438	0.027	7
	20-39	05-06	.784	0.102	9
		07-08	*	*	8
		09-10	.733	0.114	10
	40-59	05-06	1.09	0.09	6
		07-08	*	*	6
		09-10	1.13	0.1	9
60+	05-06	.926	0.18	3	
	07-08	*	*	5	
	09-10	1.27	0.13	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.11, 0.2, and 0.21, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	.760	0.087	11
	20-39	09-10	.971	0.12	13
	40-59	09-10	1.12	0.06	12
	60+	09-10	1.45	0.18	8
All Hispanic Female	12-19	09-10	.437	0.024	10
	20-39	09-10	.710	0.082	14
	40-59	09-10	1.07	0.08	14
	60+	09-10	1.12	0.1	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.11, 0.2, and 0.21, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1884
	01-02	*	< LOD	< LOD	< LOD	< LOD	1230
	03-04	*	< LOD	< LOD	< LOD	< LOD	1866
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	652
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	< LOD	< LOD	584
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1232
	01-02	*	< LOD	< LOD	< LOD	< LOD	1230
	03-04	*	< LOD	< LOD	< LOD	< LOD	1282
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	900
	01-02	*	< LOD	< LOD	< LOD	< LOD	565
	03-04	*	< LOD	< LOD	< LOD	< LOD	916
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	984
	01-02	*	< LOD	< LOD	< LOD	< LOD	665
	03-04	*	< LOD	< LOD	< LOD	< LOD	950
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	614
	01-02	*	< LOD	< LOD	< LOD	< LOD	260
	03-04	*	< LOD	< LOD	< LOD	< LOD	422
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	408
	01-02	*	< LOD	< LOD	< LOD	< LOD	218
	03-04	*	< LOD	< LOD	< LOD	< LOD	454
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	704
	01-02	*	< LOD	< LOD	< LOD	< LOD	671
	03-04	*	< LOD	< LOD	< LOD	< LOD	869

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	3.03	0.8	9
		07-08	*	*	6
		09-10	4.00	0.5	10
	20-39	05-06	6.39	1.09	12
		07-08	5.50	1.3	15
		09-10	6.38	0.62	17
	40-59	05-06	10.6	1.4	12
		07-08	7.76	1.03	16
		09-10	9.29	0.69	17
	60+	05-06	8.97	0.52	15
07-08		6.78	0.88	23	
09-10		7.29	0.58	21	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	3.27	0.48	8
	20-39	05-06	4.63	0.57	16
		07-08	*	*	13
		09-10	4.80	0.31	18
	40-59	05-06	7.32	0.98	13
		07-08	*	*	17
		09-10	6.35	0.54	17
	60+	05-06	8.72	0.57	17
07-08		5.25	0.82	21	
09-10		6.15	0.33	22	
Non-Hispanic Black Male	12-19	05-06	2.18	0.43	13
		07-08	*	*	6
		09-10	1.88	0.48	6
	20-39	05-06	**7.38	4.18	6
		07-08	*	*	6
		09-10	3.61	0.5	7
	40-59	05-06	5.11	0.79	5
		07-08	4.20	1.16	6
		09-10	4.02	0.82	6
	60+	05-06	5.80	0.53	5
07-08		4.28	1.21	8	
09-10		4.02	0.29	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	2.36	0.51	6
	20-39	05-06	3.05	0.64	7
		07-08	*	*	8
		09-10	2.95	0.36	7
	40-59	05-06	4.93	0.62	7
		07-08	*	*	8
		09-10	4.66	0.91	7
60+	05-06	7.48	1.3	5	
	07-08	*	*	7	
	09-10	5.41	0.76	6	
Mexican American Male	12-19	05-06	2.60	0.65	11
		07-08	*	*	6
		09-10	3.96	0.54	8
	20-39	05-06	5.74	0.94	9
		07-08	*	*	9
		09-10	6.94	1	8
	40-59	05-06	9.51	1.79	4
		07-08	*	*	6
		09-10	7.67	0.72	7
60+	05-06	8.23	0.86	4	
	07-08	*	*	5	
	09-10	9.31	0.4	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	2.04	0.11	7
	20-39	05-06	5.22	0.65	9
		07-08	*	*	8
		09-10	3.91	0.57	10
	40-59	05-06	8.07	0.72	6
		07-08	*	*	6
		09-10	7.04	0.41	9
60+	05-06	7.32	1.98	3	
	07-08	*	*	5	
	09-10	7.00	0.57	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	3.58	0.46	11
	20-39	09-10	6.25	0.9	13
	40-59	09-10	7.78	0.52	12
	60+	09-10	9.28	1.35	8
All Hispanic Female	12-19	09-10	2.02	0.11	10
	20-39	09-10	3.85	0.41	14
	40-59	09-10	6.58	0.38	14
	60+	09-10	6.61	0.5	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1884
	01-02	*	< LOD	< LOD	< LOD	< LOD	1202
	03-04	*	< LOD	< LOD	< LOD	< LOD	1849
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	652
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	< LOD	< LOD	581
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1232
	01-02	*	< LOD	< LOD	< LOD	< LOD	1202
	03-04	*	< LOD	< LOD	< LOD	< LOD	1268
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	904
	01-02	*	< LOD	< LOD	< LOD	< LOD	541
	03-04	*	< LOD	< LOD	< LOD	< LOD	905
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	980
	01-02	*	< LOD	< LOD	< LOD	< LOD	661
	03-04	*	< LOD	< LOD	< LOD	< LOD	944
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	623
	01-02	*	< LOD	< LOD	< LOD	< LOD	257
	03-04	*	< LOD	< LOD	< LOD	< LOD	420
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	404
	01-02	*	< LOD	< LOD	< LOD	< LOD	212
	03-04	*	< LOD	< LOD	< LOD	< LOD	453
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	705
	01-02	*	< LOD	< LOD	< LOD	< LOD	653
	03-04	*	< LOD	< LOD	< LOD	< LOD	857

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 35.6, 21.0, and 12.0, respectively.

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	3.27	0.88	6
		09-10	*	*	10
	20-39	05-06	1.80	0.41	12
		07-08	2.48	0.23	15
		09-10	*	*	17
	40-59	05-06	1.44	0.33	12
		07-08	*	*	16
		09-10	*	*	17
60+	05-06	*	*	15	
	07-08	*	*	23	
	09-10	*	*	21	
Non-Hispanic White Female	12-19	05-06	1.83	0.44	10
		07-08	2.84	0.45	7
		09-10	*	*	8
	20-39	05-06	*	*	16
		07-08	*	*	13
		09-10	*	*	18
	40-59	05-06	1.55	0.37	13
		07-08	*	*	17
		09-10	*	*	17
60+	05-06	1.95	0.38	17	
	07-08	*	*	21	
	09-10	*	*	21	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	3.03	0.29	6
		09-10	*	*	6
	20-39	05-06	*	*	6
		07-08	**4.10	1.97	6
		09-10	*	*	7
	40-59	05-06	2.25	0.66	5
		07-08	*	*	6
		09-10	*	*	7
60+	05-06	**2.72	0.93	5	
	07-08	*	*	8	
	09-10	*	*	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.37, 2.37, and 2.6, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	2.95	0.57	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	3.42	0.31	7
		07-08	2.77	0.44	8
		09-10	*	*	6
	40-59	05-06	3.09	0.53	7
		07-08	2.93	0.38	8
		09-10	*	*	6
60+	05-06	3.28	0.36	5	
	07-08	2.37	0.4	7	
	09-10	*	*	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	2.65	0.32	6
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	2.86	0.31	9
		09-10	*	*	7
	40-59	05-06	*	*	4
		07-08	*	*	6
		09-10	*	*	6
60+	05-06	*	*	4	
	07-08	*	*	5	
	09-10	*	*	4	
Mexican American Female	12-19	05-06	*	*	16
		07-08	3.07	0.24	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	3.04	0.44	8
		09-10	*	*	9
	40-59	05-06	**2.06	0.71	6
		07-08	2.78	0.46	6
		09-10	*	*	9
60+	05-06	*	*	3	
	07-08	2.59	0.21	5	
	09-10	*	*	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.37, 2.37, and 2.6, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	10
	20-39	09-10	*	*	12
	40-59	09-10	*	*	11
	60+	09-10	*	*	7
All Hispanic Female	12-19	09-10	*	*	9
	20-39	09-10	*	*	13
	40-59	09-10	*	*	13
	60+	09-10	*	*	10

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.37, 2.37, and 2.6, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1884
	01-02	*	< LOD	< LOD	< LOD	< LOD	1202
	03-04	*	< LOD	< LOD	< LOD	< LOD	1849
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	652
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	< LOD	< LOD	581
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1232
	01-02	*	< LOD	< LOD	< LOD	< LOD	1202
	03-04	*	< LOD	< LOD	< LOD	< LOD	1268
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	904
	01-02	*	< LOD	< LOD	< LOD	< LOD	541
	03-04	*	< LOD	< LOD	< LOD	< LOD	905
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	980
	01-02	*	< LOD	< LOD	< LOD	< LOD	661
	03-04	*	< LOD	< LOD	< LOD	< LOD	944
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	623
	01-02	*	< LOD	< LOD	< LOD	< LOD	257
	03-04	*	< LOD	< LOD	< LOD	< LOD	420
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	404
	01-02	*	< LOD	< LOD	< LOD	< LOD	212
	03-04	*	< LOD	< LOD	< LOD	< LOD	453
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	705
	01-02	*	< LOD	< LOD	< LOD	< LOD	653
	03-04	*	< LOD	< LOD	< LOD	< LOD	857

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	16.0	3.9	6
		09-10	*	*	10
	20-39	05-06	12.1	2.6	12
		07-08	16.1	1.4	15
		09-10	*	*	17
	40-59	05-06	11.0	2.6	12
		07-08	*	*	16
		09-10	*	*	17
60+	05-06	*	*	15	
	07-08	*	*	23	
	09-10	*	*	21	
Non-Hispanic White Female	12-19	05-06	9.51	2.14	10
		07-08	13.1	1.9	7
		09-10	*	*	8
	20-39	05-06	*	*	16
		07-08	*	*	13
		09-10	*	*	18
	40-59	05-06	11.5	2.9	13
		07-08	*	*	17
		09-10	*	*	17
60+	05-06	14.1	2.7	17	
	07-08	*	*	21	
	09-10	*	*	21	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	14.3	1.4	6
		09-10	*	*	6
	20-39	05-06	*	*	6
		07-08	**24.1	12.1	6
		09-10	*	*	7
	40-59	05-06	14.1	4.1	5
		07-08	*	*	6
		09-10	*	*	7
60+	05-06	**15.7	5.1	5	
	07-08	*	*	8	
	09-10	*	*	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	14.4	2.7	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	19.7	1.7	7
		07-08	13.9	2.2	8
		09-10	*	*	6
	40-59	05-06	19.7	3.4	7
		07-08	17.7	2.7	8
		09-10	*	*	6
	60+	05-06	21.7	1.8	5
07-08		14.6	2.6	7	
09-10		*	*	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	14.5	2.4	6
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	19.8	2.6	9
		09-10	*	*	7
	40-59	05-06	*	*	4
		07-08	*	*	6
		09-10	*	*	6
	60+	05-06	*	*	4
07-08		*	*	5	
09-10		*	*	4	
Mexican American Female	12-19	05-06	*	*	16
		07-08	15.1	1.4	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	17.2	1.9	8
		09-10	*	*	9
	40-59	05-06	**14.9	4.9	6
		07-08	18.6	3.1	6
		09-10	*	*	9
	60+	05-06	*	*	3
07-08		17.7	1.5	5	
		09-10	*	*	6

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated; proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	10
	20-39	09-10	*	*	12
	40-59	09-10	*	*	11
	60+	09-10	*	*	7
All Hispanic Female	12-19	09-10	*	*	9
	20-39	09-10	*	*	13
	40-59	09-10	*	*	13
	60+	09-10	*	*	10

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8-Pentachlorodibenzofuran (PeCDF) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1922
	01-02	*	< LOD	< LOD	< LOD	< LOD	1235
	03-04	*	< LOD	< LOD	< LOD	< LOD	1867
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	663
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	< LOD	< LOD	586
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1259
	01-02	*	< LOD	< LOD	< LOD	< LOD	1235
	03-04	*	< LOD	< LOD	< LOD	< LOD	1281
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	920
	01-02	*	< LOD	< LOD	< LOD	< LOD	565
	03-04	*	< LOD	< LOD	< LOD	< LOD	917
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	1002
	01-02	*	< LOD	< LOD	< LOD	< LOD	670
	03-04	*	< LOD	< LOD	< LOD	< LOD	950
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	637
	01-02	*	< LOD	< LOD	< LOD	< LOD	263
	03-04	*	< LOD	< LOD	< LOD	< LOD	423
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	409
	01-02	*	< LOD	< LOD	< LOD	< LOD	217
	03-04	*	< LOD	< LOD	< LOD	< LOD	454
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	717
	01-02	*	< LOD	< LOD	< LOD	< LOD	670
	03-04	*	< LOD	< LOD	< LOD	< LOD	869

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 13.2, 5.8, and 7.1, respectively.

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8-Pentachlorodibenzofuran (PeCDF) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	*	*	12
		07-08	*	*	15
		09-10	*	*	17
	40-59	05-06	*	*	12
		07-08	*	*	16
		09-10	*	*	17
60+	05-06	*	*	15	
	07-08	*	*	23	
	09-10	*	*	19	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	*	*	16
		07-08	*	*	13
		09-10	*	*	18
	40-59	05-06	*	*	13
		07-08	*	*	17
		09-10	*	*	16
60+	05-06	*	*	17	
	07-08	*	*	21	
	09-10	*	*	22	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	5
	20-39	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	*	*	5
		07-08	*	*	6
		09-10	*	*	6
60+	05-06	*	*	5	
	07-08	*	*	8	
	09-10	*	*	8	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.47, 0.81, and 0.85, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8-Pentachlorodibenzofuran (PeCDF) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	6
60+	05-06	*	*	5	
	07-08	*	*	7	
	09-10	*	*	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	9
		09-10	*	*	7
	40-59	05-06	*	*	4
		07-08	*	*	6
		09-10	*	*	6
60+	05-06	*	*	4	
	07-08	*	*	5	
	09-10	*	*	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	8
		09-10	*	*	10
	40-59	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	9
60+	05-06	*	*	3	
	07-08	*	*	5	
	09-10	*	*	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.47, 0.81, and 0.85, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8-Pentachlorodibenzofuran (PeCDF) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	10
	20-39	09-10	*	*	12
	40-59	09-10	*	*	11
	60+	09-10	*	*	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	13
	40-59	09-10	*	*	14
	60+	09-10	*	*	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.47, 0.81, and 0.85, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8-Pentachlorodibenzofuran (PeCDF) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1922
	01-02	*	< LOD	< LOD	< LOD	< LOD	1235
	03-04	*	< LOD	< LOD	< LOD	< LOD	1867
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	663
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	< LOD	< LOD	586
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1259
	01-02	*	< LOD	< LOD	< LOD	< LOD	1235
	03-04	*	< LOD	< LOD	< LOD	< LOD	1281
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	920
	01-02	*	< LOD	< LOD	< LOD	< LOD	565
	03-04	*	< LOD	< LOD	< LOD	< LOD	917
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	1002
	01-02	*	< LOD	< LOD	< LOD	< LOD	670
	03-04	*	< LOD	< LOD	< LOD	< LOD	950
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	637
	01-02	*	< LOD	< LOD	< LOD	< LOD	263
	03-04	*	< LOD	< LOD	< LOD	< LOD	423
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	409
	01-02	*	< LOD	< LOD	< LOD	< LOD	217
	03-04	*	< LOD	< LOD	< LOD	< LOD	454
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	717
	01-02	*	< LOD	< LOD	< LOD	< LOD	670
	03-04	*	< LOD	< LOD	< LOD	< LOD	869

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8-Pentachlorodibenzofuran (PeCDF) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	*	*	12
		07-08	*	*	15
		09-10	*	*	17
	40-59	05-06	*	*	12
		07-08	*	*	16
		09-10	*	*	17
60+	05-06	*	*	15	
	07-08	*	*	23	
	09-10	*	*	19	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	*	*	16
		07-08	*	*	13
		09-10	*	*	18
	40-59	05-06	*	*	13
		07-08	*	*	17
		09-10	*	*	16
60+	05-06	*	*	17	
	07-08	*	*	21	
	09-10	*	*	22	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	5
	20-39	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	*	*	5
		07-08	*	*	6
		09-10	*	*	6
60+	05-06	*	*	5	
	07-08	*	*	8	
	09-10	*	*	8	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8-Pentachlorodibenzofuran (PeCDF) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	6
	60+	05-06	*	*	5
07-08		*	*	7	
09-10		*	*	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	9
		09-10	*	*	7
	40-59	05-06	*	*	4
		07-08	*	*	6
		09-10	*	*	6
	60+	05-06	*	*	4
07-08		*	*	5	
09-10		*	*	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	8
		09-10	*	*	10
	40-59	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	9
	60+	05-06	*	*	3
07-08		*	*	5	
09-10		*	*	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 1,2,3,7,8-Pentachlorodibenzofuran (PeCDF) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	10
	20-39	09-10	*	*	12
	40-59	09-10	*	*	11
	60+	09-10	*	*	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	13
	40-59	09-10	*	*	14
	60+	09-10	*	*	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,4,7,8-Pentachlorodibenzofuran (PeCDF) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	15.9 (13.7-17.1)	1895
	01-02	*	< LOD	9.20 (7.50-11.1)	14.3 (12.3-16.2)	18.1 (16.1-21.1)	1230
	03-04	*	< LOD	6.80 (<LOD-7.20)	9.90 (8.90-10.7)	12.3 (11.0-13.3)	1871
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	656
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	< LOD	< LOD	586
20 years and older	99-00	*	< LOD	< LOD	12.7 (<LOD-13.9)	16.1 (14.1-17.6)	1239
	01-02	*	< LOD	9.20 (7.50-11.1)	14.3 (12.3-16.2)	18.1 (16.1-21.1)	1230
	03-04	*	< LOD	7.20 (<LOD-7.70)	10.3 (9.40-11.2)	13.0 (11.4-14.7)	1285
Gender Males	99-00	*	< LOD	< LOD	< LOD	13.9 (12.8-15.4)	906
	01-02	*	< LOD	9.40 (7.30-11.6)	14.1 (11.6-16.7)	16.7 (14.0-22.8)	560
	03-04	*	< LOD	7.00 (<LOD-7.30)	9.80 (8.70-10.6)	12.2 (10.4-14.8)	920
Females	99-00	*	< LOD	< LOD	13.1 (<LOD-16.1)	16.7 (14.3-19.2)	989
	01-02	*	< LOD	9.10 (7.50-10.7)	14.5 (13.0-16.1)	18.5 (16.4-21.2)	670
	03-04	*	< LOD	< LOD	10.3 (8.90-11.0)	12.6 (11.0-13.7)	951
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	632
	01-02	*	< LOD	< LOD	7.80 (6.10-9.80)	9.80 (7.80-12.5)	264
	03-04	*	< LOD	< LOD	< LOD	7.90 (<LOD-10.5)	423
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	16.3 (13.4-19.0)	400
	01-02	*	< LOD	8.40 (6.80-9.30)	14.1 (11.7-16.4)	19.1 (15.1-23.0)	216
	03-04	*	< LOD	< LOD	9.80 (8.00-13.9)	15.9 (9.70-23.9)	454
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	15.6 (13.8-17.1)	706
	01-02	*	5.90 (<LOD-6.90)	10.3 (8.10-12.0)	15.5 (13.0-17.6)	18.5 (16.5-22.2)	665
	03-04	*	< LOD	7.10 (<LOD-7.70)	10.3 (9.10-11.2)	12.4 (11.0-13.7)	873

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 12.7, 5.5, and 6.8, respectively.

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,4,7,8-Pentachlorodibenzofuran (PeCDF) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	2.26	0.14	9
		07-08	3.20	0.23	6
		09-10	2.51	0.13	10
	20-39	05-06	3.45	0.3	12
		07-08	3.76	0.19	15
		09-10	3.31	0.2	17
	40-59	05-06	5.82	0.26	12
		07-08	5.40	0.23	16
		09-10	6.16	0.46	17
60+	05-06	8.03	0.43	15	
	07-08	7.32	0.47	23	
	09-10	7.33	0.43	20	
Non-Hispanic White Female	12-19	05-06	1.79	0.11	10
		07-08	1.95	0.25	7
		09-10	1.77	0.23	8
	20-39	05-06	2.70	0.16	16
		07-08	2.99	0.22	13
		09-10	2.46	0.14	18
	40-59	05-06	4.56	0.17	13
		07-08	4.59	0.2	17
		09-10	4.22	0.22	17
60+	05-06	8.49	0.5	17	
	07-08	7.82	0.43	21	
	09-10	8.19	0.57	22	
Non-Hispanic Black Male	12-19	05-06	1.84	0.1	13
		07-08	1.95	0.15	6
		09-10	1.35	0.17	6
	20-39	05-06	3.48	1	6
		07-08	2.61	0.22	6
		09-10	2.13	0.3	7
	40-59	05-06	3.83	0.29	5
		07-08	4.78	0.47	6
		09-10	3.98	0.4	7
60+	05-06	7.19	0.95	5	
	07-08	6.78	0.64	8	
	09-10	5.62	0.5	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.51, 0.88, and 0.92, respectively.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,4,7,8-Pentachlorodibenzofuran (PeCDF) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	1.19	0.1	14
		07-08	1.41	0.09	5
		09-10	1.39	0.4	6
	20-39	05-06	2.13	0.15	7
		07-08	2.03	0.19	8
		09-10	1.70	0.16	7
	40-59	05-06	3.98	0.4	7
		07-08	4.58	0.53	8
		09-10	4.13	0.48	7
	60+	05-06	12.7	2.5	5
07-08		9.57	0.86	7	
09-10		9.52	0.88	7	
Mexican American Male	12-19	05-06	1.67	0.24	11
		07-08	2.36	0.38	6
		09-10	2.01	0.18	8
	20-39	05-06	2.65	0.26	9
		07-08	2.97	0.28	9
		09-10	2.82	0.27	8
	40-59	05-06	3.82	0.39	4
		07-08	4.45	0.69	6
		09-10	3.92	0.25	7
	60+	05-06	5.90	0.43	4
07-08		5.51	0.51	5	
09-10		8.07	1.48	5	
Mexican American Female	12-19	05-06	1.00	0.15	16
		07-08	1.34	0.32	5
		09-10	1.23	0.14	7
	20-39	05-06	2.05	0.23	9
		07-08	2.10	0.24	8
		09-10	1.92	0.3	10
	40-59	05-06	3.51	0.19	6
		07-08	3.79	0.36	6
		09-10	3.61	0.28	9
	60+	05-06	6.10	0.41	3
07-08		7.21	0.84	5	
09-10		7.10	0.82	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.51, 0.88, and 0.92, respectively.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,4,7,8-Pentachlorodibenzofuran (PeCDF) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	1.96	0.14	11
	20-39	09-10	2.54	0.23	13
	40-59	09-10	4.17	0.26	12
	60+	09-10	7.10	1.02	8
All Hispanic Female	12-19	09-10	1.25	0.1	10
	20-39	09-10	1.96	0.21	14
	40-59	09-10	3.62	0.21	14
	60+	09-10	6.83	0.49	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.51, 0.88, and 0.92, respectively.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,4,7,8-Pentachlorodibenzofuran (PeCDF) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	103 (96.0-113)	1895
	01-02	*	< LOD	60.8 (51.3-70.6)	99.4 (83.4-114)	134 (113-152)	1230
	03-04	*	< LOD	44.2 (<LOD-46.9)	65.7 (60.5-71.1)	83.9 (74.9-92.9)	1871
Age group							
12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	656
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	< LOD	< LOD	586
20 years and older	99-00	*	< LOD	< LOD	85.2 (<LOD-96.0)	107 (98.3-125)	1239
	01-02	*	< LOD	60.8 (51.3-70.6)	99.4 (83.4-114)	134 (113-152)	1230
	03-04	*	< LOD	46.5 (<LOD-50.6)	69.3 (62.2-74.6)	86.8 (78.3-99.8)	1285
Gender							
Males	99-00	*	< LOD	< LOD	< LOD	95.7 (80.1-101)	906
	01-02	*	< LOD	62.7 (49.3-76.6)	98.5 (76.6-134)	135 (105-160)	560
	03-04	*	< LOD	43.4 (<LOD-46.3)	62.0 (56.8-71.9)	83.2 (72.4-95.0)	920
Females	99-00	*	< LOD	< LOD	90.0 (<LOD-101)	111 (97.2-129)	989
	01-02	*	< LOD	59.8 (52.0-67.6)	100 (90.5-105)	126 (107-146)	670
	03-04	*	< LOD	< LOD	66.9 (59.7-74.3)	84.4 (74.7-95.7)	951
Race/ethnicity							
Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	632
	01-02	*	< LOD	< LOD	55.8 (48.7-69.7)	76.3 (61.9-92.4)	264
	03-04	*	< LOD	< LOD	< LOD	57.1 (<LOD-70.2)	423
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	105 (82.7-116)	400
	01-02	*	< LOD	50.0 (41.3-60.4)	89.5 (72.3-107)	121 (92.0-154)	216
	03-04	*	< LOD	< LOD	66.8 (48.5-93.2)	97.4 (79.1-129)	454
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	103 (96.8-122)	706
	01-02	*	37.5 (<LOD-44.1)	65.7 (52.9-78.2)	104 (90.7-118)	136 (118-154)	665
	03-04	*	< LOD	45.9 (<LOD-50.6)	68.3 (61.3-73.6)	85.0 (74.6-102)	873

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,4,7,8-Pentachlorodibenzofuran (PeCDF) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	12.4	0.9	9
		07-08	15.9	1	6
		09-10	13.4	0.8	10
	20-39	05-06	25.6	3.2	12
		07-08	24.9	1.6	15
		09-10	21.8	1.6	17
	40-59	05-06	43.9	2.4	12
		07-08	39.9	2	16
		09-10	41.3	2.6	17
60+	05-06	54.6	2.6	15	
	07-08	46.3	2.4	23	
	09-10	44.4	2.6	20	
Non-Hispanic White Female	12-19	05-06	9.51	0.56	10
		07-08	9.09	1.25	7
		09-10	8.50	1.2	8
	20-39	05-06	17.7	1.3	16
		07-08	17.7	1.3	13
		09-10	13.1	0.9	18
	40-59	05-06	33.7	2.2	13
		07-08	30.4	1.5	17
		09-10	26.7	1.5	17
60+	05-06	62.0	3.8	17	
	07-08	52.4	2.9	21	
	09-10	49.3	2.9	22	
Non-Hispanic Black Male	12-19	05-06	9.24	0.4	13
		07-08	9.22	0.52	6
		09-10	6.16	0.85	6
	20-39	05-06	**20.7	6.2	6
		07-08	14.8	1.4	6
		09-10	11.9	1.4	7
	40-59	05-06	24.5	2.1	5
		07-08	30.6	2.9	6
		09-10	24.4	2.1	7
60+	05-06	42.9	5.6	5	
	07-08	40.9	3.6	8	
	09-10	30.0	2.5	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,4,7,8-Pentachlorodibenzofuran (PeCDF) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	5.91	0.52	14
		07-08	6.68	0.43	5
		09-10	6.08	1.67	6
	20-39	05-06	12.2	0.9	7
		07-08	10.3	1	8
		09-10	8.38	0.78	7
	40-59	05-06	25.4	2.5	7
		07-08	28.0	4	8
		09-10	23.3	2.8	7
	60+	05-06	05-06	84.3	16
07-08			57.2	3.5	7
09-10		09-10	54.4	4.7	7
		09-10	54.4	4.7	7
Mexican American Male	12-19	05-06	8.95	1.21	11
		07-08	12.9	2.7	6
		09-10	9.43	0.92	8
	20-39	05-06	18.5	1.4	9
		07-08	20.4	2.3	9
		09-10	17.4	2.3	8
	40-59	05-06	31.2	4.2	4
		07-08	31.2	4.1	6
		09-10	27.9	2.2	7
	60+	05-06	05-06	42.4	2.1
07-08			39.8	4.3	5
09-10		09-10	49.8	9.2	5
		09-10	49.8	9.2	5
Mexican American Female	12-19	05-06	5.53	0.81	16
		07-08	6.50	1.49	5
		09-10	5.70	0.62	7
	20-39	05-06	13.8	1.7	9
		07-08	12.3	1.6	8
		09-10	10.3	1.6	10
	40-59	05-06	26.0	2	6
		07-08	25.4	2.2	6
		09-10	23.3	2.3	9
	60+	05-06	05-06	46.7	6.2
07-08			49.5	6.2	5
09-10		39.0	3.5	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,4,7,8-Pentachlorodibenzofuran (PeCDF) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	9.18	0.73	11
	20-39	09-10	16.3	2	13
	40-59	09-10	29.1	2.2	12
	60+	09-10	44.8	6.3	8
All Hispanic Female	12-19	09-10	5.75	0.45	10
	20-39	09-10	10.7	1.2	14
	40-59	09-10	22.7	1.6	14
	60+	09-10	40.3	2.4	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,7,8-Tetrachlorodibenzofuran (TCDF) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1903
	01-02	*	< LOD	< LOD	< LOD	< LOD	1229
	03-04	*	< LOD	< LOD	< LOD	< LOD	1868
Age group							
12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	660
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	< LOD	< LOD	586
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1243
	01-02	*	< LOD	< LOD	< LOD	< LOD	1229
	03-04	*	< LOD	< LOD	< LOD	< LOD	1282
Gender							
Males	99-00	*	< LOD	< LOD	< LOD	< LOD	912
	01-02	*	< LOD	< LOD	< LOD	< LOD	558
	03-04	*	< LOD	< LOD	< LOD	< LOD	917
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	991
	01-02	*	< LOD	< LOD	< LOD	< LOD	671
	03-04	*	< LOD	< LOD	< LOD	< LOD	951
Race/ethnicity							
Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	628
	01-02	*	< LOD	< LOD	< LOD	< LOD	262
	03-04	*	< LOD	< LOD	< LOD	< LOD	423
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	409
	01-02	*	< LOD	< LOD	< LOD	< LOD	217
	03-04	*	< LOD	< LOD	< LOD	< LOD	454
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	707
	01-02	*	< LOD	< LOD	< LOD	< LOD	667
	03-04	*	< LOD	< LOD	< LOD	< LOD	870

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 11.9, 5.2, and 6.0, respectively.

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,7,8-Tetrachlorodibenzofuran (TCDF) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	9
	20-39	05-06	*	*	12
		07-08	*	*	15
		09-10	*	*	17
	40-59	05-06	*	*	12
		07-08	.502	0.103	16
		09-10	.557	0.089	16
60+	05-06	*	*	15	
	07-08	*	*	23	
	09-10	*	*	20	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	*	*	16
		07-08	*	*	13
		09-10	*	*	18
	40-59	05-06	*	*	13
		07-08	*	*	17
		09-10	*	*	17
	60+	05-06	*	*	17
		07-08	*	*	21
		09-10	*	*	14
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	6
	20-39	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	*	*	5
		07-08	*	*	6
		09-10	*	*	7
	60+	05-06	*	*	5
		07-08	*	*	8
		09-10	*	*	8

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.26, 0.45, and 0.48, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,7,8-Tetrachlorodibenzofuran (TCDF) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
	60+	05-06	*	*	5
07-08		*	*	7	
09-10		*	*	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	*	*	9
		07-08	*	*	9
		09-10	*	*	8
	40-59	05-06	*	*	4
		07-08	*	*	6
		09-10	*	*	7
	60+	05-06	*	*	4
07-08		*	*	5	
09-10		.569	0.1	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	8
		09-10	*	*	9
	40-59	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	9
	60+	05-06	*	*	3
07-08		*	*	5	
09-10		*	*	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.26, 0.45, and 0.48, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,7,8-Tetrachlorodibenzofuran (TCDF) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	*	*	13
	40-59	09-10	*	*	12
	60+	09-10	.487	0.096	7
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	13
	40-59	09-10	*	*	14
	60+	09-10	*	*	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.26, 0.45, and 0.48, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,7,8-Tetrachlorodibenzofuran (TCDF) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1903
	01-02	*	< LOD	< LOD	< LOD	< LOD	1229
	03-04	*	< LOD	< LOD	< LOD	< LOD	1868
Age group							
12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	660
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	< LOD	< LOD	586
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1243
	01-02	*	< LOD	< LOD	< LOD	< LOD	1229
	03-04	*	< LOD	< LOD	< LOD	< LOD	1282
Gender							
Males	99-00	*	< LOD	< LOD	< LOD	< LOD	912
	01-02	*	< LOD	< LOD	< LOD	< LOD	558
	03-04	*	< LOD	< LOD	< LOD	< LOD	917
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	991
	01-02	*	< LOD	< LOD	< LOD	< LOD	671
	03-04	*	< LOD	< LOD	< LOD	< LOD	951
Race/ethnicity							
Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	628
	01-02	*	< LOD	< LOD	< LOD	< LOD	262
	03-04	*	< LOD	< LOD	< LOD	< LOD	423
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	409
	01-02	*	< LOD	< LOD	< LOD	< LOD	217
	03-04	*	< LOD	< LOD	< LOD	< LOD	454
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	707
	01-02	*	< LOD	< LOD	< LOD	< LOD	667
	03-04	*	< LOD	< LOD	< LOD	< LOD	870

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,7,8-Tetrachlorodibenzofuran (TCDF) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	9
	20-39	05-06	*	*	12
		07-08	*	*	15
		09-10	*	*	17
	40-59	05-06	*	*	12
		07-08	3.65	0.72	16
		09-10	3.81	0.62	16
	60+	05-06	*	*	15
		07-08	*	*	23
		09-10	*	*	20
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	*	*	16
		07-08	*	*	13
		09-10	*	*	18
	40-59	05-06	*	*	13
		07-08	*	*	17
		09-10	*	*	17
	60+	05-06	*	*	17
		07-08	*	*	21
		09-10	*	*	14
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	6
	20-39	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	*	*	5
		07-08	*	*	6
		09-10	*	*	7
	60+	05-06	*	*	5
		07-08	*	*	8
		09-10	*	*	8

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,7,8-Tetrachlorodibenzofuran (TCDF) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
	60+	05-06	*	*	5
07-08		*	*	7	
09-10		*	*	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	*	*	9
		07-08	*	*	9
		09-10	*	*	8
	40-59	05-06	*	*	4
		07-08	*	*	6
		09-10	*	*	7
	60+	05-06	*	*	4
07-08		*	*	5	
09-10		3.46	0.53	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	8
		09-10	*	*	9
	40-59	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	9
	60+	05-06	*	*	3
07-08		*	*	5	
09-10		*	*	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,7,8-Tetrachlorodibenzofuran (TCDF) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	*	*	13
	40-59	09-10	*	*	12
	60+	09-10	2.96	0.55	7
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	13
	40-59	09-10	*	*	14
	60+	09-10	*	*	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 3,4,4',5-Tetrachlorobiphenyl (PCB 81) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1883
	01-02	*	< LOD	< LOD	< LOD	< LOD	1215
	03-04	*	< LOD	< LOD	< LOD	13.4 (<LOD-16.4)	1860
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	651
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	< LOD	14.7 (<LOD-16.5)	579
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1232
	01-02	*	< LOD	< LOD	< LOD	< LOD	1215
	03-04	*	< LOD	< LOD	< LOD	13.1 (<LOD-16.5)	1281
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	900
	01-02	*	< LOD	< LOD	< LOD	< LOD	554
	03-04	*	< LOD	< LOD	< LOD	14.4 (<LOD-17.9)	913
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	983
	01-02	*	< LOD	< LOD	< LOD	< LOD	661
	03-04	*	< LOD	< LOD	< LOD	< LOD	947
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	621
	01-02	*	< LOD	< LOD	< LOD	< LOD	259
	03-04	*	< LOD	< LOD	< LOD	18.7 (<LOD-25.2)	420
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	405
	01-02	*	< LOD	< LOD	< LOD	< LOD	218
	03-04	*	< LOD	< LOD	< LOD	< LOD	453
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	699
	01-02	*	< LOD	< LOD	< LOD	< LOD	657
	03-04	*	< LOD	< LOD	< LOD	13.1 (<LOD-16.4)	867

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 68.4, 26.8, and 13.1, respectively.

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 3,4,4',5-Tetrachlorobiphenyl (PCB 81) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	*	*	12
		07-08	*	*	15
		09-10	*	*	17
	40-59	05-06	*	*	12
		07-08	*	*	16
		09-10	*	*	17
60+	05-06	2.50	0.44	15	
	07-08	*	*	23	
	09-10	*	*	20	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	*	*	16
		07-08	*	*	13
		09-10	*	*	18
	40-59	05-06	*	*	13
		07-08	*	*	17
		09-10	*	*	16
60+	05-06	2.65	0.23	17	
	07-08	*	*	21	
	09-10	*	*	22	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	6
	20-39	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	*	*	5
		07-08	*	*	6
		09-10	*	*	7
60+	05-06	2.21	0.2	5	
	07-08	*	*	8	
	09-10	*	*	8	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.86, 3.23, and 3.5, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 3,4,4',5-Tetrachlorobiphenyl (PCB 81) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
	60+	05-06	2.74	0.26	5
07-08		3.60	0.7	7	
09-10		*	*	7	
Mexican American Male	12-19	05-06	2.14	0.29	11
		07-08	**3.33	2.08	6
		09-10	*	*	8
	20-39	05-06	*	*	9
		07-08	*	*	9
		09-10	*	*	8
	40-59	05-06	*	*	4
		07-08	*	*	6
		09-10	*	*	7
	60+	05-06	2.05	0.3	4
07-08		*	*	5	
09-10		*	*	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	8
		09-10	*	*	10
	40-59	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	9
	60+	05-06	2.10	0.11	3
07-08		*	*	5	
09-10		*	*	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.86, 3.23, and 3.5, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 3,4,4',5-Tetrachlorobiphenyl (PCB 81) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	*	*	13
	40-59	09-10	*	*	12
	60+	09-10	*	*	7
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	*	*	14
	60+	09-10	*	*	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.86, 3.23, and 3.5, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 3,4,4',5-Tetrachlorobiphenyl (PCB 81) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1883
	01-02	*	< LOD	< LOD	< LOD	< LOD	1215
	03-04	*	< LOD	< LOD	< LOD	80.3 (<LOD-96.2)	1860
Age group							
12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	651
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	< LOD	71.4 (<LOD-82.8)	579
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1232
	01-02	*	< LOD	< LOD	< LOD	< LOD	1215
	03-04	*	< LOD	< LOD	< LOD	80.7 (<LOD-99.3)	1281
Gender							
Males	99-00	*	< LOD	< LOD	< LOD	< LOD	900
	01-02	*	< LOD	< LOD	< LOD	< LOD	554
	03-04	*	< LOD	< LOD	< LOD	81.1 (<LOD-104)	913
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	983
	01-02	*	< LOD	< LOD	< LOD	< LOD	661
	03-04	*	< LOD	< LOD	< LOD	< LOD	947
Race/ethnicity							
Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	621
	01-02	*	< LOD	< LOD	< LOD	< LOD	259
	03-04	*	< LOD	< LOD	< LOD	103 (<LOD-199)	420
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	405
	01-02	*	< LOD	< LOD	< LOD	< LOD	218
	03-04	*	< LOD	< LOD	< LOD	< LOD	453
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	699
	01-02	*	< LOD	< LOD	< LOD	< LOD	657
	03-04	*	< LOD	< LOD	< LOD	80.5 (<LOD-106)	867

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 3,4,4',5-Tetrachlorobiphenyl (PCB 81) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	*	*	12
		07-08	*	*	15
		09-10	*	*	17
	40-59	05-06	*	*	12
		07-08	*	*	16
		09-10	*	*	17
	60+	05-06	17.0	3	15
07-08		*	*	23	
09-10		*	*	20	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	*	*	16
		07-08	*	*	13
		09-10	*	*	18
	40-59	05-06	*	*	13
		07-08	*	*	17
		09-10	*	*	16
	60+	05-06	19.4	1.6	17
07-08		*	*	21	
09-10		*	*	22	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	6
	20-39	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	*	*	5
		07-08	*	*	6
		09-10	*	*	7
	60+	05-06	13.1	0.9	5
		07-08	*	*	8
		09-10	*	*	8

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 3,4,4',5-Tetrachlorobiphenyl (PCB 81) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
60+	05-06	18.3	1.6	5	
	07-08	21.8	4.5	7	
	09-10	*	*	7	
Mexican American Male	12-19	05-06	11.6	1.6	11
		07-08	**16.6	9.6	6
		09-10	*	*	8
	20-39	05-06	*	*	9
		07-08	*	*	9
		09-10	*	*	8
	40-59	05-06	*	*	4
		07-08	*	*	6
		09-10	*	*	7
	60+	05-06	14.6	1.9	4
		07-08	*	*	5
		09-10	*	*	5
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	8
		09-10	*	*	10
	40-59	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	9
	60+	05-06	16.1	2.3	3
		07-08	*	*	5
		09-10	*	*	6

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 3,4,4',5-Tetrachlorobiphenyl (PCB 81) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	*	*	13
	40-59	09-10	*	*	12
	60+	09-10	*	*	7
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	*	*	14
	60+	09-10	*	*	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 3,3',4,4',5-Pentachlorobiphenyl (PCB 126) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	28.5 (24.9-32.8)	53.2 (45.7-59.9)	80.5 (62.8-100)	1896
	01-02	22.7 (20.9-24.7)	24.5 (22.2-26.8)	40.8 (36.1-47.5)	69.3 (61.6-80.8)	108 (92.7-116)	1226
	03-04	16.3 (14.9-17.9)	14.7 (<LOD-16.5)	24.8 (22.4-27.4)	46.7 (41.6-51.9)	68.7 (58.1-84.4)	1860
Age group 12-19 years	99-00	*	< LOD	< LOD	24.3 (<LOD-27.5)	31.1 (26.4-36.4)	658
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	17.0 (15.2-20.2)	21.2 (17.3-25.6)	577
20 years and older	99-00	*	< LOD	30.8 (27.2-36.3)	57.1 (50.5-65.8)	89.5 (66.1-110)	1238
	01-02	22.7 (20.9-24.7)	24.5 (22.2-26.8)	40.8 (36.1-47.5)	69.3 (61.6-80.8)	108 (92.7-116)	1226
	03-04	17.6 (16.0-19.3)	16.0 (14.2-18.6)	26.8 (24.2-30.3)	49.8 (43.5-59.1)	74.8 (60.2-94.4)	1283
Gender Males	99-00	*	< LOD	25.8 (<LOD-28.9)	41.6 (36.1-45.7)	62.0 (49.7-75.0)	911
	01-02	20.3 (18.5-22.3)	23.1 (20.8-25.4)	36.6 (32.8-39.4)	52.7 (46.4-62.3)	81.9 (61.0-101)	561
	03-04	14.9 (<LOD-16.4)	< LOD	21.8 (20.1-25.4)	38.5 (31.0-46.1)	51.5 (46.5-60.5)	912
Females	99-00	*	< LOD	33.6 (27.4-41.4)	59.4 (53.0-78.7)	98.1 (69.9-120)	985
	01-02	25.1 (22.9-27.4)	26.1 (23.0-28.8)	48.6 (41.4-54.4)	82.9 (71.1-96.8)	116 (98.6-128)	665
	03-04	17.8 (16.0-19.7)	15.7 (<LOD-18.4)	27.6 (24.3-33.4)	57.1 (46.0-67.1)	82.5 (63.0-109)	948
Race/ethnicity Mexican Americans	99-00	*	< LOD	23.8 (<LOD-30.3)	43.2 (37.0-52.6)	66.1 (52.4-79.2)	631
	01-02	17.8 (15.5-20.4)	19.9 (18.3-21.2)	28.5 (26.5-34.2)	47.9 (39.7-54.9)	69.2 (49.3-103)	262
	03-04	15.5 (<LOD-17.9)	14.2 (<LOD-17.5)	22.5 (18.9-26.8)	31.2 (27.4-37.8)	42.0 (33.5-48.0)	420
Non-Hispanic blacks	99-00	*	< LOD	30.6 (25.2-43.1)	67.4 (45.0-126)	126 (67.4-224)	404
	01-02	22.2 (18.2-27.0)	22.1 (19.6-25.4)	44.3 (37.9-51.5)	88.4 (59.0-111)	115 (96.1-153)	217
	03-04	16.5 (13.9-19.5)	< LOD	23.5 (18.9-34.6)	63.4 (41.5-126)	142 (52.1-292)	452
Non-Hispanic whites	99-00	*	< LOD	28.3 (<LOD-34.0)	50.5 (41.6-57.0)	67.8 (57.0-94.1)	704
	01-02	23.1 (20.9-25.4)	24.7 (22.0-27.6)	42.0 (35.4-49.6)	72.3 (63.9-82.9)	114 (91.0-128)	663
	03-04	16.0 (14.3-17.8)	14.5 (<LOD-16.9)	24.3 (21.4-28.2)	46.5 (41.6-50.9)	64.0 (52.1-76.1)	869

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 23.2, 10.8, and 13.9, respectively.

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 3,3',4,4',5-Pentachlorobiphenyl (PCB 126) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	6.23	0.47	9
		07-08	5.53	0.66	6
		09-10	5.67	0.45	10
	20-39	05-06	8.12	0.78	12
		07-08	7.73	0.54	15
		09-10	7.68	0.79	17
	40-59	05-06	17.6	2.4	12
		07-08	12.3	0.8	16
		09-10	12.8	1.4	17
60+	05-06	26.8	3.3	15	
	07-08	27.0	2.7	23	
	09-10	22.7	1.5	20	
Non-Hispanic White Female	12-19	05-06	5.62	0.27	10
		07-08	5.53	0.66	7
		09-10	4.80	0.41	8
	20-39	05-06	9.55	1.07	16
		07-08	10.2	1.2	13
		09-10	6.76	0.53	18
	40-59	05-06	16.4	2	13
		07-08	14.4	1.3	17
		09-10	15.2	1.4	16
	60+	05-06	35.6	2.6	17
		07-08	31.5	3.3	21
		09-10	32.4	4.5	22
Non-Hispanic Black Male	12-19	05-06	5.76	0.42	13
		07-08	5.11	0.38	6
		09-10	3.62	0.43	5
	20-39	05-06	6.77	1	6
		07-08	6.42	0.67	6
		09-10	**8.76	2.73	7
	40-59	05-06	15.0	3.4	5
		07-08	13.4	2.2	6
		09-10	27.2	7.7	7
	60+	05-06	30.9	5.4	5
		07-08	25.0	4.5	8
		09-10	26.9	5.5	8

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.32, 2.29, and 2.5, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 3,3',4,4',5-Pentachlorobiphenyl (PCB 126) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	5.64	0.31	14
		07-08	4.62	0.28	5
		09-10	3.77	0.29	6
	20-39	05-06	9.74	1.07	7
		07-08	7.62	0.68	8
		09-10	8.10	1.52	7
	40-59	05-06	20.2	2.5	7
		07-08	**23.9	7.7	8
		09-10	30.8	7.7	7
	60+	05-06	**83.7	31.4	5
07-08		56.2	5.1	7	
09-10		58.6	5.7	7	
Mexican American Male	12-19	05-06	6.00	0.34	11
		07-08	6.29	0.92	6
		09-10	5.01	0.33	8
	20-39	05-06	8.96	0.46	9
		07-08	8.95	0.61	9
		09-10	6.58	0.83	8
	40-59	05-06	15.9	2.2	4
		07-08	17.5	3.3	6
		09-10	14.7	1.6	7
	60+	05-06	26.4	4.8	4
07-08		28.9	5.8	5	
09-10		25.7	2.9	5	
Mexican American Female	12-19	05-06	5.86	0.43	16
		07-08	5.80	0.53	5
		09-10	4.51	0.31	7
	20-39	05-06	8.20	0.62	9
		07-08	8.42	0.63	8
		09-10	6.10	0.86	10
	40-59	05-06	19.2	2.6	6
		07-08	16.5	2.1	6
		09-10	18.3	2	9
	60+	05-06	40.2	7.1	3
07-08		36.3	5.7	5	
09-10		39.3	2.7	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.32, 2.29, and 2.5, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 3,3',4,4',5-Pentachlorobiphenyl (PCB 126) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	5.30	0.39	11
	20-39	09-10	6.93	0.82	13
	40-59	09-10	15.1	1.4	12
	60+	09-10	26.2	2.4	7
All Hispanic Female	12-19	09-10	4.49	0.33	10
	20-39	09-10	7.29	0.93	14
	40-59	09-10	17.7	1.8	14
	60+	09-10	39.0	2.7	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.32, 2.29, and 2.5, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 3,3',4,4',5-Pentachlorobiphenyl (PCB 126) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	177 (151-212)	336 (294-404)	564 (455-663)	1896
	01-02	147 (135-160)	158 (143-175)	270 (249-298)	482 (436-541)	738 (625-840)	1226
	03-04	100 (91.0-110)	89.8 (<LOD-101)	159 (146-178)	308 (273-349)	475 (378-590)	1860
Age group 12-19 years	99-00	*	< LOD	< LOD	108 (<LOD-126)	144 (116-196)	658
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	88.2 (78.8-106)	109 (89.2-135)	577
20 years and older	99-00	*	< LOD	204 (173-232)	381 (319-451)	596 (479-709)	1238
	01-02	147 (135-160)	158 (143-175)	270 (249-298)	482 (436-541)	738 (625-840)	1226
	03-04	111 (100-122)	100 (88.7-115)	176 (158-194)	326 (286-394)	534 (394-668)	1283
Gender Males	99-00	*	< LOD	154 (<LOD182)	260 (241-274)	382 (308-509)	911
	01-02	134 (121-149)	152 (130-169)	249 (233-267)	399 (346-467)	566 (467-693)	561
	03-04	92.3 (<LOD-102)	< LOD	148 (131-168)	245 (203-296)	360 (296-442)	912
Females	99-00	*	< LOD	212 (159-250)	429 (350-531)	648 (534-744)	985
	01-02	159 (146-172)	160 (149-186)	301 (270-348)	550 (483-637)	818 (658-958)	665
	03-04	108 (96.2-121)	94.5 (<LOD-110)	180 (153-212)	370 (303-455)	559 (438-843)	948
Race/ethnicity Mexican Americans	99-00	*	< LOD	146 (<LOD213)	285 (229-364)	424 (361-534)	631
	01-02	114 (97.8-133)	125 (106-150)	217 (175-257)	335 (272-460)	593 (354-784)	262
	03-04	95.3 (<LOD-111)	91.4 (<LOD-99.4)	145 (116-180)	238 (172-288)	298 (238-461)	420
Non-Hispanic blacks	99-00	*	< LOD	192 (147-258)	457 (308-691)	786 (457-1520)	404
	01-02	131 (106-161)	128 (110-158)	266 (214-304)	532 (361-662)	779 (585-1060)	217
	03-04	94.3 (79.0-112)	< LOD	143 (106-254)	483 (254-847)	976 (483-1430)	452
Non-Hispanic whites	99-00	*	< LOD	175 (<LOD215)	311 (274-356)	508 (394-660)	704
	01-02	150 (136-164)	160 (146-179)	276 (249-301)	486 (431-553)	746 (600-937)	663
	03-04	98.4 (87.5-111)	89.4 (<LOD-104)	158 (142-182)	297 (260-346)	431 (365-541)	869

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 3,3',4,4',5-Pentachlorobiphenyl (PCB 126) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	34.3	3.1	9
		07-08	27.5	3.1	6
		09-10	30.4	2.7	10
	20-39	05-06	59.8	7.5	12
		07-08	51.2	4.1	15
		09-10	50.9	6	17
	40-59	05-06	134	21	12
		07-08	90.7	5.6	16
		09-10	87.0	9.9	17
60+	05-06	181	19	15	
	07-08	172	16	23	
	09-10	138	10	20	
Non-Hispanic White Female	12-19	05-06	30.0	1.6	10
		07-08	26.0	3.3	7
		09-10	23.0	2.2	8
	20-39	05-06	62.7	8.1	16
		07-08	61.2	8.7	13
		09-10	36.1	3.3	18
	40-59	05-06	123	17	13
		07-08	95.4	9.7	17
		09-10	92.9	8.6	16
	60+	05-06	259	18	17
		07-08	211	22	21
		09-10	194	24	22
Non-Hispanic Black Male	12-19	05-06	29.2	2.3	13
		07-08	24.1	1.4	6
		09-10	16.8	2.6	5
	20-39	05-06	40.3	6.6	6
		07-08	36.5	4.5	6
		09-10	49.3	14.6	7
	40-59	05-06	96.2	22.6	5
		07-08	85.7	13.5	6
		09-10	163	42	7
	60+	05-06	184	31	5
		07-08	150	24	8
		09-10	146	33	8

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 3,3',4,4',5-Pentachlorobiphenyl (PCB 126) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	27.9	1.5	14
		07-08	22.1	2.1	5
		09-10	16.6	1.2	6
	20-39	05-06	56.3	6.6	7
		07-08	38.5	3.5	8
		09-10	40.3	7.6	7
	40-59	05-06	129	16	7
		07-08	**147	51	8
		09-10	171	40	7
	60+	05-06	**558	211	5
07-08		338	29	7	
09-10		335	33	7	
Mexican American Male	12-19	05-06	32.6	1.7	11
		07-08	33.4	4.9	6
		09-10	23.5	1.6	8
	20-39	05-06	63.0	2.2	9
		07-08	62.3	7.4	9
		09-10	41.1	7.2	8
	40-59	05-06	131	22	4
		07-08	126	24	6
		09-10	105	13	7
	60+	05-06	188	32	4
07-08		211	48	5	
09-10		157	16	5	
Mexican American Female	12-19	05-06	32.0	2.3	16
		07-08	28.4	2.7	5
		09-10	21.1	1.5	7
	20-39	05-06	54.9	4.8	9
		07-08	49.3	5.4	8
		09-10	33.0	4.8	10
	40-59	05-06	143	21	6
		07-08	112	16	6
		09-10	119	15	9
	60+	05-06	301	54	3
07-08		250	42	5	
09-10		219	15	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 3,3',4,4',5-Pentachlorobiphenyl (PCB 126) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	24.7	1.9	11
	20-39	09-10	46.4	8.5	13
	40-59	09-10	106	11	12
	60+	09-10	158	12	7
All Hispanic Female	12-19	09-10	20.9	1.6	10
	20-39	09-10	40.2	5.5	14
	40-59	09-10	112	12	14
	60+	09-10	232	16	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	34.4 (31.0-38.7)	44.9 (40.6-48.9)	1888
	01-02	17.9 (16.0-19.9)	19.0 (17.0-22.0)	33.1 (27.7-38.6)	50.0 (43.9-55.0)	60.9 (56.1-65.8)	1223
	03-04	*	< LOD	19.5 (16.8-22.7)	31.0 (27.9-36.0)	40.6 (36.5-47.3)	1866
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	648
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	< LOD	< LOD	581
20 years and older	99-00	*	< LOD	< LOD	36.4 (33.8-40.3)	47.8 (42.8-51.0)	1240
	01-02	17.9 (16.0-19.9)	19.0 (17.0-22.0)	33.1 (27.7-38.6)	50.0 (43.9-55.0)	60.9 (56.1-65.8)	1223
	03-04	*	< LOD	21.9 (19.0-24.2)	32.7 (28.6-37.3)	43.2 (37.3-49.5)	1285
Gender Males	99-00	*	< LOD	< LOD	36.2 (31.9-40.1)	44.3 (39.0-51.3)	908
	01-02	20.2 (17.8-22.8)	22.1 (18.5-25.3)	36.0 (29.5-43.2)	53.7 (46.5-57.3)	60.9 (55.7-69.0)	559
	03-04	*	< LOD	22.3 (17.7-24.8)	36.3 (29.3-41.1)	46.1 (38.8-52.0)	917
Females	99-00	*	< LOD	< LOD	34.0 (29.4-38.6)	46.5 (37.9-51.1)	980
	01-02	16.0 (14.2-18.1)	17.0 (14.7-19.2)	30.2 (24.5-36.5)	46.4 (40.7-51.9)	60.9 (52.2-70.0)	664
	03-04	*	< LOD	18.4 (<LOD-20.4)	28.4 (27.2-30.6)	35.8 (31.0-41.1)	949
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	31.9 (28.8-35.2)	622
	01-02	*	< LOD	15.0 (11.3-18.3)	25.4 (18.3-32.3)	32.5 (26.7-41.9)	260
	03-04	*	< LOD	< LOD	< LOD	20.9 (16.5-30.2)	420
Non-Hispanic blacks	99-00	*	< LOD	< LOD	40.3 (28.7-48.6)	52.2 (44.3-63.6)	403
	01-02	17.2 (15.4-19.1)	18.5 (15.7-20.0)	31.7 (25.8-35.4)	47.5 (42.0-54.0)	57.3 (48.3-64.5)	217
	03-04	*	< LOD	17.3 (<LOD-22.6)	31.5 (26.8-36.9)	58.7 (31.5-97.9)	453
Non-Hispanic whites	99-00	*	< LOD	< LOD	34.6 (31.7-40.1)	45.3 (40.1-50.9)	709
	01-02	19.5 (17.2-22.2)	21.4 (17.4-24.7)	36.0 (29.8-41.1)	53.5 (47.0-58.3)	64.3 (59.2-72.8)	662
	03-04	*	< LOD	21.2 (17.4-24.5)	32.6 (27.3-38.8)	41.1 (35.9-50.2)	873

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 27.0, 11.0, and 15.9, respectively.

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	5.13	0.42	9
		07-08	4.59	0.53	6
		09-10	4.17	0.38	10
	20-39	05-06	8.17	0.77	12
		07-08	7.16	0.34	15
		09-10	6.94	0.5	17
	40-59	05-06	19.9	1.4	12
		07-08	16.6	0.7	16
		09-10	17.0	1.3	17
60+	05-06	35.7	1.8	15	
	07-08	32.6	1.9	23	
	09-10	33.9	2.3	20	
Non-Hispanic White Female	12-19	05-06	3.68	0.19	10
		07-08	3.10	0.58	7
		09-10	3.26	0.5	8
	20-39	05-06	6.72	0.58	16
		07-08	5.05	0.45	13
		09-10	4.87	0.32	18
	40-59	05-06	14.2	0.7	13
		07-08	14.1	0.7	17
		09-10	13.5	1.1	16
	60+	05-06	31.4	2.2	17
		07-08	28.1	1.6	21
		09-10	30.7	2.3	22
Non-Hispanic Black Male	12-19	05-06	5.18	0.31	13
		07-08	3.96	0.38	6
		09-10	3.66	0.18	5
	20-39	05-06	7.95	0.57	6
		07-08	6.68	0.59	6
		09-10	7.35	0.62	7
	40-59	05-06	17.5	0.7	5
		07-08	18.8	2.1	6
		09-10	18.6	2.9	7
	60+	05-06	39.1	3.8	5
		07-08	31.4	3.4	8
		09-10	33.5	3.1	8

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.33, 2.31, and 2.5, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	3.19	0.11	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	6.20	0.44	7
		07-08	4.66	0.29	8
		09-10	4.62	0.54	7
	40-59	05-06	13.8	1.6	7
		07-08	14.0	1.6	8
		09-10	14.9	2.3	7
	60+	05-06	45.0	8.5	5
07-08		36.8	2.7	7	
09-10		38.9	3.9	7	
Mexican American Male	12-19	05-06	3.79	0.46	11
		07-08	3.89	0.6	6
		09-10	3.96	0.35	7
	20-39	05-06	6.10	0.14	9
		07-08	5.71	0.4	9
		09-10	5.12	0.4	8
	40-59	05-06	11.1	0.3	4
		07-08	13.2	1.2	6
		09-10	14.0	0.6	7
	60+	05-06	27.2	2.5	4
07-08		24.6	2.6	5	
09-10		28.4	2.7	5	
Mexican American Female	12-19	05-06	3.17	0.15	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	4.42	0.3	9
		07-08	3.90	0.25	8
		09-10	3.10	0.44	10
	40-59	05-06	10.2	1.5	6
		07-08	10.9	1.8	6
		09-10	8.88	0.81	9
	60+	05-06	18.7	1.8	3
07-08		21.5	3.5	5	
09-10		23.5	3.3	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.33, 2.31, and 2.5, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in pg/g lipid or parts per trillion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	4.25	0.3	10
	20-39	09-10	5.57	0.59	13
	40-59	09-10	14.6	1	12
	60+	09-10	28.1	2	7
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	3.85	0.49	14
	40-59	09-10	9.65	0.77	14
	60+	09-10	22.2	2	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.33, 2.31, and 2.5, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	230 (219-244)	287 (274-319)	1888
	01-02	115 (103-129)	125 (108-146)	217 (189-253)	344 (300-376)	416 (379-490)	1223
	03-04	*	< LOD	133 (114-149)	203 (191-226)	269 (243-305)	1866
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	648
	01-02	†	†	†	†	†	†
	03-04	*	< LOD	< LOD	< LOD	< LOD	581
20 years and older	99-00	*	< LOD	< LOD	241 (227-261)	303 (281-339)	1240
	01-02	115 (103-129)	125 (108-146)	217 (189-253)	344 (300-376)	416 (379-490)	1223
	03-04	*	< LOD	146 (130-160)	216 (198-242)	287 (245-325)	1285
Gender Males	99-00	*	< LOD	< LOD	229 (215-258)	286 (256-338)	908
	01-02	133 (117-152)	151 (130-168)	244 (198-293)	363 (309-409)	449 (372-529)	559
	03-04	*	< LOD	143 (122-159)	225 (190-259)	291 (245-334)	917
Females	99-00	*	< LOD	< LOD	234 (197-257)	293 (261-346)	980
	01-02	102 (90.0-115)	107 (91.0-123)	195 (170-234)	319 (282-368)	402 (373-462)	664
	03-04	*	< LOD	120 (<LOD140)	194 (182-203)	249 (222-284)	949
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	215 (181-261)	622
	01-02	*	< LOD	98.1 (79.3-138)	184 (143-250)	266 (179-341)	260
	03-04	*	< LOD	< LOD	< LOD	168 (109-237)	420
Non-Hispanic blacks	99-00	*	< LOD	< LOD	251 (190-299)	320 (262-410)	403
	01-02	101 (91.2-113)	104 (88.0-118)	190 (147-234)	299 (267-335)	362 (309-423)	217
	03-04	*	< LOD	110 (<LOD-144)	216 (162-257)	338 (221-556)	453
Non-Hispanic whites	99-00	*	< LOD	< LOD	238 (222-257)	286 (267-340)	709
	01-02	127 (112-144)	145 (124-157)	229 (195-275)	368 (317-388)	438 (388-515)	662
	03-04	*	< LOD	141 (116-165)	210 (189-242)	277 (239-324)	873

† Data not collected for this age group for Survey year 01-02.

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	28.1	2.4	9
		07-08	22.6	2.3	6
		09-10	22.1	1.8	10
	20-39	05-06	59.9	7.1	12
		07-08	47.2	2.7	15
		09-10	45.5	3.8	17
	40-59	05-06	150	13	12
		07-08	122	6	16
		09-10	115	9	17
60+	05-06	242	10	15	
	07-08	209	12	23	
	09-10	205	13	20	
Non-Hispanic White Female	12-19	05-06	19.7	1.3	10
		07-08	14.7	3.1	7
		09-10	15.7	2.6	8
	20-39	05-06	44.1	4.5	16
		07-08	30.2	3	13
		09-10	25.7	1.6	18
	40-59	05-06	106	9	13
		07-08	93.6	5.1	17
		09-10	82.6	6.9	16
	60+	05-06	228	16	17
		07-08	188	11	21
		09-10	186	13	22
Non-Hispanic Black Male	12-19	05-06	26.0	1.3	13
		07-08	18.7	1.5	6
		09-10	16.7	1.2	5
	20-39	05-06	46.9	3.4	6
		07-08	37.4	2.6	6
		09-10	41.8	4	7
	40-59	05-06	112	5	5
		07-08	120	13	6
		09-10	113	15	7
	60+	05-06	235	26	5
		07-08	189	19	8
		09-10	180	18	8

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	15.8	0.5	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	35.8	2.8	7
		07-08	23.5	1.5	8
		09-10	23.0	2.9	7
	40-59	05-06	88.8	10.6	7
		07-08	85.2	11.9	8
		09-10	83.3	11.5	7
	60+	05-06	299	54	5
07-08		222	18	7	
09-10		222	20	7	
Mexican American Male	12-19	05-06	20.2	2.3	11
		07-08	21.0	4.2	6
		09-10	18.5	1.7	7
	20-39	05-06	43.3	1.7	9
		07-08	39.3	3.5	9
		09-10	31.6	3.6	8
	40-59	05-06	90.6	5.2	4
		07-08	94.5	10.7	6
		09-10	99.4	6.9	7
	60+	05-06	194	9	4
07-08		176	18	5	
09-10		174	15	5	
Mexican American Female	12-19	05-06	17.3	0.8	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	29.6	2.4	9
		07-08	22.8	2.1	8
		09-10	16.7	2.4	10
	40-59	05-06	75.8	11.9	6
		07-08	73.3	12.2	6
		09-10	57.3	6.1	9
	60+	05-06	144	23	3
07-08		149	27	5	
09-10		129	16	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in fg/g of serum or parts per quadrillion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	19.8	1.5	10
	20-39	09-10	37.0	6.3	13
	40-59	09-10	101	8	12
	60+	09-10	170	11	7
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	21.2	2.9	14
	40-59	09-10	60.5	5.3	14
	60+	09-10	130	10	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1915
	01-02	*	< LOD	< LOD	< LOD	< LOD	2307
	03-04	1.20 (1.09-1.31)	1.09 (1.00-1.20)	1.90 (1.75-2.20)	4.04 (3.40-4.89)	6.24 (5.20-7.79)	1879
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	665
	01-02	*	< LOD	< LOD	< LOD	< LOD	758
	03-04	.686 (.603-.781)	.700 (.600-.720)	1.00 (.900-1.11)	1.50 (1.20-2.00)	2.26 (1.50-3.50)	593
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1250
	01-02	*	< LOD	< LOD	< LOD	< LOD	1549
	03-04	1.30 (1.18-1.43)	1.15 (1.04-1.30)	2.10 (1.86-2.40)	4.44 (3.80-5.20)	6.82 (5.70-8.30)	1286
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	913
	01-02	*	< LOD	< LOD	< LOD	< LOD	1075
	03-04	1.02 (.923-1.12)	.980 (.850-1.08)	1.60 (1.40-1.80)	3.20 (2.76-3.42)	4.70 (3.83-5.50)	937
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	1002
	01-02	*	< LOD	< LOD	< LOD	< LOD	1232
	03-04	1.40 (1.25-1.57)	1.20 (1.05-1.40)	2.30 (2.00-2.79)	5.17 (4.47-5.90)	7.70 (6.00-9.55)	942
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	635
	01-02	*	< LOD	< LOD	< LOD	< LOD	567
	03-04	.719 (.624-.829)	.700 (.600-.800)	1.10 (.900-1.36)	1.90 (1.80-2.20)	2.90 (1.98-3.52)	427
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	12.8 (<LOD-18.0)	409
	01-02	*	< LOD	< LOD	< LOD	< LOD	515
	03-04	1.41 (1.15-1.74)	1.14 (.980-1.32)	2.47 (1.70-3.90)	6.70 (4.09-10.1)	11.9 (6.40-18.1)	456
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	714
	01-02	*	< LOD	< LOD	< LOD	< LOD	1061
	03-04	1.21 (1.08-1.36)	1.10 (1.00-1.20)	1.90 (1.74-2.28)	3.91 (3.22-4.85)	5.93 (4.98-7.79)	878

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 12.4, 10.5, and 0.4, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	.507	0.097	9
		07-08	*	*	6
		09-10	.577	0.046	10
	20-39	05-06	.671	0.134	12
		07-08	.808	0.058	15
		09-10	.999	0.208	17
	40-59	05-06	**1.64	0.5	12
		07-08	1.02	0.07	16
		09-10	.870	0.113	17
60+	05-06	2.15	0.26	15	
	07-08	3.01	0.36	23	
	09-10	2.54	0.42	20	
Non-Hispanic White Female	12-19	05-06	.482	0.041	10
		07-08	.555	0.065	7
		09-10	.437	0.046	8
	20-39	05-06	.598	0.044	16
		07-08	1.06	0.16	13
		09-10	.654	0.045	19
	40-59	05-06	1.29	0.15	13
		07-08	1.36	0.13	17
		09-10	1.82	0.41	17
	60+	05-06	3.84	0.41	17
		07-08	4.09	0.7	21
		09-10	3.34	0.39	22
Non-Hispanic Black Male	12-19	05-06	.524	0.041	13
		07-08	*	*	6
		09-10	*	*	5
	20-39	05-06	.517	0.083	6
		07-08	.580	0.117	6
		09-10	.619	0.138	6
	40-59	05-06	1.31	0.33	5
		07-08	1.52	0.31	6
		09-10	2.27	0.48	7
	60+	05-06	3.46	0.76	5
		07-08	3.00	0.32	8
		09-10	3.03	0.42	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.37, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.431	0.026	14
		07-08	*	*	5
		09-10	.429	0.07	5
	20-39	05-06	.728	0.102	7
		07-08	.698	0.129	8
		09-10	.689	0.107	7
	40-59	05-06	2.19	0.26	7
		07-08	2.43	0.42	8
		09-10	3.79	0.66	7
	60+	05-06	**8.54	3.02	5
07-08		7.46	1.29	7	
09-10		6.66	0.84	7	
Mexican American Male	12-19	05-06	.341	0.032	11
		07-08	*	*	6
		09-10	.458	0.051	8
	20-39	05-06	.484	0.031	9
		07-08	.745	0.085	9
		09-10	.561	0.08	8
	40-59	05-06	.835	0.076	4
		07-08	1.45	0.34	6
		09-10	.878	0.115	8
	60+	05-06	1.34	0.12	4
07-08		1.78	0.2	5	
09-10		2.26	0.27	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	.421	0.043	9
		07-08	.669	0.027	8
		09-10	*	*	9
	40-59	05-06	1.32	0.14	6
		07-08	1.33	0.16	6
		09-10	1.16	0.08	9
	60+	05-06	2.81	0.51	3
07-08		2.89	0.44	5	
09-10		2.90	0.36	5	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.37, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	.450	0.043	11
	20-39	09-10	.663	0.072	13
	40-59	09-10	1.05	0.12	13
	60+	09-10	2.27	0.19	8
All Hispanic Female	12-19	09-10	.444	0.084	10
	20-39	09-10	.556	0.102	13
	40-59	09-10	1.24	0.13	13
	60+	09-10	3.10	0.29	10

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.37, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1915
	01-02	*	< LOD	< LOD	< LOD	< LOD	2307
	03-04	.007 (.007-.008)	.007 (.006-.007)	.012 (.011-.014)	.027 (.023-.031)	.043 (.037-.049)	1879
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	665
	01-02	*	< LOD	< LOD	< LOD	< LOD	758
	03-04	.003 (.003-.004)	.003 (.003-.004)	.005 (.005-.006)	.008 (.006-.010)	.011 (.008-.020)	593
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1250
	01-02	*	< LOD	< LOD	< LOD	< LOD	1549
	03-04	.008 (.007-.009)	.007 (.006-.008)	.014 (.012-.015)	.030 (.026-.035)	.047 (.039-.053)	1286
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	913
	01-02	*	< LOD	< LOD	< LOD	< LOD	1075
	03-04	.006 (.006-.007)	.006 (.005-.007)	.010 (.009-.011)	.019 (.016-.023)	.030 (.027-.039)	937
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	1002
	01-02	*	< LOD	< LOD	< LOD	< LOD	1232
	03-04	.008 (.007-.010)	.007 (.006-.009)	.015 (.013-.017)	.033 (.029-.040)	.049 (.043-.067)	942
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	635
	01-02	*	< LOD	< LOD	< LOD	< LOD	567
	03-04	.004 (.004-.005)	.004 (.004-.005)	.007 (.006-.009)	.014 (.011-.017)	.019 (.015-.023)	427
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	.090 (<LOD-.110)	409
	01-02	*	< LOD	< LOD	< LOD	< LOD	515
	03-04	.008 (.007-.010)	.007 (.005-.008)	.015 (.010-.020)	.041 (.027-.067)	.082 (.041-.116)	456
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	714
	01-02	*	< LOD	< LOD	< LOD	< LOD	1061
	03-04	.007 (.007-.008)	.007 (.006-.007)	.012 (.011-.014)	.027 (.022-.031)	.043 (.035-.049)	878

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	.003	0.001	9
		07-08	*	*	6
		09-10	3.09	0.27	10
	20-39	05-06	.005	0.001	12
		07-08	.005	0	15
		09-10	6.60	1.47	17
	40-59	05-06	** .013	0.004	12
		07-08	.007	0.001	16
		09-10	5.91	0.81	17
60+	05-06	.014	0.001	15	
	07-08	.019	0.002	23	
	09-10	15.8	2.8	20	
Non-Hispanic White Female	12-19	05-06	.003	0	10
		07-08	.003	0	7
		09-10	2.08	0.23	8
	20-39	05-06	.004	0	16
		07-08	.006	0.001	13
		09-10	3.52	0.3	19
	40-59	05-06	.010	0.001	13
		07-08	.009	0.001	17
		09-10	11.3	2.4	17
60+	05-06	.028	0.003	17	
	07-08	.027	0.005	21	
	09-10	20.1	2.1	22	
Non-Hispanic Black Male	12-19	05-06	.003	0	13
		07-08	*	*	6
		09-10	*	*	5
	20-39	05-06	.003	0.001	6
		07-08	.003	0.001	6
		09-10	3.62	0.94	6
	40-59	05-06	.008	0.002	5
		07-08	.010	0.002	6
		09-10	13.7	2.7	7
60+	05-06	.020	0.005	5	
	07-08	.018	0.002	8	
	09-10	16.4	2.5	9	

† See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.002	0	14
		07-08	*	*	5
		09-10	1.90	0.28	5
	20-39	05-06	.004	0.001	7
		07-08	.004	0.001	8
		09-10	3.43	0.55	7
	40-59	05-06	.014	0.002	7
		07-08	.015	0.003	8
		09-10	21.3	3.7	7
	60+	05-06	** .057	0.02	5
07-08		.044	0.006	7	
09-10		38.1	4.9	7	
Mexican American Male	12-19	05-06	.002	0	11
		07-08	*	*	6
		09-10	2.15	0.25	8
	20-39	05-06	.003	0	9
		07-08	.005	0.001	9
		09-10	3.39	0.48	8
	40-59	05-06	.007	0.001	4
		07-08	.010	0.003	6
		09-10	6.01	0.86	8
	60+	05-06	.010	0.001	4
07-08		.013	0.002	5	
09-10		13.9	1.5	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	.003	0	9
		07-08	.004	0	8
		09-10	*	*	9
	40-59	05-06	.010	0.001	6
		07-08	.009	0.001	6
		09-10	7.52	0.66	9
	60+	05-06	.021	0.003	3
07-08		.020	0.003	5	
09-10		16.0	1.8	5	

† See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	2.09	0.19	11
	20-39	09-10	4.29	0.63	13
	40-59	09-10	7.07	0.76	13
	60+	09-10	14.3	1.1	8
All Hispanic Female	12-19	09-10	2.05	0.38	10
	20-39	09-10	3.12	0.59	13
	40-59	09-10	7.81	0.82	13
	60+	09-10	18.5	1.8	10

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,4,4',5-Pentachlorobiphenyl (PCB 114) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	*	*	12
		07-08	*	*	15
		09-10	*	*	17
	40-59	05-06	.597	0.052	12
		07-08	.686	0.062	16
		09-10	.506	0.056	17
	60+	05-06	1.22	0.09	15
07-08		1.60	0.16	23	
09-10		1.28	0.14	19	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	*	*	16
		07-08	*	*	13
		09-10	*	*	19
	40-59	05-06	.723	0.058	13
		07-08	.798	0.095	17
		09-10	.959	0.162	17
	60+	05-06	1.62	0.13	17
07-08		1.99	0.18	21	
09-10		1.84	0.17	22	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	6
	20-39	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	.458	0.059	5
		07-08	.572	0.129	6
		09-10	.600	0.075	7
	60+	05-06	1.52	0.18	5
07-08		1.48	0.17	8	
09-10		1.38	0.08	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,4,4',5-Pentachlorobiphenyl (PCB 114) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	.712	0.092	7
		07-08	*	*	8
		09-10	.797	0.147	7
	60+	05-06	2.83	0.57	5
07-08		2.32	0.21	7	
09-10		2.44	0.28	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	*	*	9
		07-08	*	*	9
		09-10	*	*	8
	40-59	05-06	*	*	4
		07-08	*	*	6
		09-10	*	*	8
	60+	05-06	.689	0.113	4
07-08		.934	0.076	5	
09-10		.911	0.114	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	8
		09-10	*	*	10
	40-59	05-06	.361	0.059	6
		07-08	.450	0.125	6
		09-10	*	*	9
	60+	05-06	.869	0.068	3
07-08		.992	0.121	5	
09-10		1.09	0.22	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,4,4',5-Pentachlorobiphenyl (PCB 114) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	*	*	13
	40-59	09-10	*	*	13
	60+	09-10	.946	0.092	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	*	*	14
	60+	09-10	1.15	0.13	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,4,4',5-Pentachlorobiphenyl (PCB 114) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	*	*	12
		07-08	*	*	15
		09-10	*	*	17
	40-59	05-06	.005	0	12
		07-08	.005	0	16
		09-10	3.42	0.37	17
	60+	05-06	.008	0.001	15
		07-08	.010	0.001	23
		09-10	7.75	0.78	19
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	*	*	16
		07-08	*	*	13
		09-10	*	*	19
	40-59	05-06	.005	0.001	13
		07-08	.005	0.001	17
		09-10	5.99	0.97	17
	60+	05-06	.012	0.001	17
		07-08	.013	0.001	21
		09-10	11.3	1.1	22
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	6
	20-39	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	.003	0	5
		07-08	.004	0.001	6
		09-10	3.69	0.41	7
	60+	05-06	.009	0.001	5
		07-08	.009	0.001	8
		09-10	7.44	0.52	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,4,4',5-Pentachlorobiphenyl (PCB 114) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	.005	0.001	7
		07-08	*	*	8
		09-10	4.52	0.85	7
	60+	05-06	.019	0.004	5
07-08		.014	0.001	7	
09-10		13.9	1.4	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	*	*	9
		07-08	*	*	9
		09-10	*	*	8
	40-59	05-06	*	*	4
		07-08	*	*	6
		09-10	*	*	8
	60+	05-06	.005	0.001	4
07-08		.007	0	5	
09-10		5.55	0.6	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	8
		09-10	*	*	10
	40-59	05-06	.003	0	6
		07-08	.003	0.001	6
		09-10	*	*	9
	60+	05-06	.007	0	3
07-08		.007	0.001	5	
09-10		6.00	1.09	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,4,4,5'-Pentachlorobiphenyl (PCB 114) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	*	*	13
	40-59	09-10	*	*	13
	60+	09-10	5.91	0.49	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	*	*	14
	60+	09-10	6.79	0.77	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3',4,4',5-Pentachlorobiphenyl (PCB 118) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	13.1 (<LOD-15.1)	27.0 (22.1-30.3)	40.8 (32.8-48.6)	1926
	01-02	*	< LOD	15.1 (13.0-17.5)	29.0 (26.1-33.7)	44.6 (39.6-48.9)	2307
	03-04	6.00 (5.54-6.50)	5.19 (4.80-5.61)	10.4 (9.70-11.6)	21.8 (19.3-23.8)	31.3 (28.2-36.6)	1887
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	667
	01-02	*	< LOD	< LOD	< LOD	< LOD	758
	03-04	3.06 (2.76-3.39)	2.83 (2.70-3.10)	4.15 (3.60-4.56)	6.80 (4.70-9.60)	9.60 (6.80-13.2)	596
20 years and older	99-00	*	< LOD	14.9 (12.9-17.4)	28.1 (24.8-33.8)	43.8 (35.6-52.3)	1259
	01-02	*	< LOD	16.9 (15.1-19.0)	32.4 (28.3-37.3)	46.5 (41.1-51.0)	1549
	03-04	6.62 (6.10-7.18)	5.65 (5.21-6.40)	11.5 (10.2-12.6)	22.8 (20.7-25.9)	34.3 (29.6-39.6)	1291
Gender Males	99-00	*	< LOD	< LOD	19.6 (16.6-24.4)	28.0 (24.4-38.1)	919
	01-02	*	< LOD	12.0 (<LOD-14.9)	22.0 (17.6-27.1)	32.7 (25.4-47.5)	1075
	03-04	5.11 (4.70-5.57)	4.71 (4.16-5.06)	8.72 (7.30-9.70)	16.4 (14.0-18.9)	23.2 (20.7-25.1)	940
Females	99-00	*	< LOD	16.7 (13.6-19.7)	32.0 (27.1-40.3)	46.8 (41.2-57.8)	1007
	01-02	*	< LOD	18.7 (16.5-21.0)	36.4 (31.6-40.9)	48.9 (44.5-54.3)	1232
	03-04	6.99 (6.32-7.73)	6.02 (5.31-6.84)	12.3 (11.1-14.4)	27.3 (22.7-30.0)	37.8 (31.3-45.0)	947
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	17.3 (14.5-19.6)	23.7 (20.9-27.1)	636
	01-02	*	< LOD	< LOD	16.8 (12.5-21.7)	26.4 (19.3-33.2)	567
	03-04	3.56 (3.04-4.18)	3.15 (2.60-3.82)	5.02 (4.26-6.66)	9.37 (7.45-11.7)	14.0 (10.0-17.6)	426
Non-Hispanic blacks	99-00	*	< LOD	19.0 (13.6-21.7)	38.7 (28.4-54.4)	59.7 (45.7-80.8)	413
	01-02	*	< LOD	15.6 (12.6-19.9)	37.3 (26.1-46.4)	54.9 (40.0-66.6)	515
	03-04	6.70 (5.52-8.14)	5.25 (4.40-6.10)	12.7 (8.80-18.0)	35.1 (21.1-45.0)	57.8 (33.5-110)	462
Non-Hispanic whites	99-00	*	< LOD	13.1 (<LOD-15.6)	25.6 (20.8-32.0)	40.3 (30.4-46.8)	720
	01-02	*	< LOD	15.9 (13.6-18.1)	31.1 (27.1-35.9)	45.3 (38.7-50.1)	1061
	03-04	6.19 (5.57-6.87)	5.46 (4.85-6.20)	10.9 (9.62-12.1)	22.0 (19.3-24.4)	30.7 (26.2-36.6)	878

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 12.5, 10.5, and 0.6, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3',4,4',5-Pentachlorobiphenyl (PCB 118) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	2.24	0.31	9
		07-08	2.29	0.32	6
		09-10	2.50	0.18	10
	20-39	05-06	3.30	0.67	12
		07-08	3.30	0.22	15
		09-10	4.03	0.66	17
	40-59	05-06	7.56	1.56	12
		07-08	5.16	0.23	16
		09-10	4.65	0.55	17
60+	05-06	13.3	1.4	15	
	07-08	15.5	1.6	23	
	09-10	13.1	1.2	21	
Non-Hispanic White Female	12-19	05-06	2.07	0.15	10
		07-08	2.41	0.23	7
		09-10	2.04	0.18	8
	20-39	05-06	2.99	0.19	16
		07-08	4.18	0.58	13
		09-10	2.97	0.18	19
	40-59	05-06	7.83	0.8	13
		07-08	7.56	0.73	17
		09-10	10.5	2.5	17
	60+	05-06	21.9	2	17
		07-08	21.5	2.8	21
		09-10	19.6	2.1	22
Non-Hispanic Black Male	12-19	05-06	2.47	0.24	13
		07-08	2.04	0.2	6
		09-10	1.71	0.19	5
	20-39	05-06	2.62	0.49	6
		07-08	2.85	0.35	6
		09-10	3.89	0.9	7
	40-59	05-06	7.30	1.8	5
		07-08	7.31	1.3	6
		09-10	11.6	2.6	7
	60+	05-06	19.9	3.6	5
		07-08	16.1	1.7	8
		09-10	16.3	2.1	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.72, 0.3, and 0.44, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3',4,4',5-Pentachlorobiphenyl (PCB 118) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	2.02	0.11	14
		07-08	1.92	0.24	5
		09-10	1.71	0.3	6
	20-39	05-06	3.70	0.44	7
		07-08	3.37	0.3	8
		09-10	2.94	0.45	7
	40-59	05-06	11.7	1.3	7
		07-08	11.2	1.9	8
		09-10	16.9	3.4	7
	60+	05-06	45.0	13.5	5
07-08		35.1	5	7	
09-10		34.0	4.3	7	
Mexican American Male	12-19	05-06	1.50	0.11	11
		07-08	1.52	0.18	6
		09-10	1.91	0.22	8
	20-39	05-06	2.17	0.14	9
		07-08	2.66	0.22	9
		09-10	2.41	0.25	7
	40-59	05-06	4.06	0.35	4
		07-08	6.03	0.93	6
		09-10	4.06	0.45	8
	60+	05-06	8.12	0.99	4
07-08		8.69	0.8	5	
09-10		10.6	1.4	5	
Mexican American Female	12-19	05-06	1.36	0.08	16
		07-08	**1.21	0.37	5
		09-10	1.43	0.31	7
	20-39	05-06	1.94	0.2	9
		07-08	2.50	0.17	8
		09-10	2.00	0.19	10
	40-59	05-06	6.79	0.67	6
		07-08	6.11	0.85	6
		09-10	5.80	0.44	9
	60+	05-06	15.3	2.7	3
07-08		14.0	2.5	5	
09-10		15.2	2.1	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.72, 0.3, and 0.44, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3',4,4',5-Pentachlorobiphenyl (PCB 118) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	1.96	0.18	10
	20-39	09-10	2.80	0.24	12
	40-59	09-10	4.98	0.5	13
	60+	09-10	11.5	1.1	8
All Hispanic Female	12-19	09-10	1.69	0.29	10
	20-39	09-10	2.55	0.34	14
	40-59	09-10	5.88	0.52	14
	60+	09-10	15.9	1.5	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.72, 0.3, and 0.44, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3',4,4',5-Pentachlorobiphenyl (PCB 118) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	.090 (<LOD-.100)	.180 (.150-.200)	.260 (.220-.320)	1926
	01-02	*	< LOD	.100 (.090-.110)	.190 (.160-.220)	.300 (.270-.320)	2307
	03-04	.037 (.034-.040)	.032 (.029-.036)	.066 (.061-.073)	.143 (.127-.160)	.216 (.192-.233)	1887
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	667
	01-02	*	< LOD	< LOD	< LOD	< LOD	758
	03-04	.015 (.014-.017)	.014 (.013-.016)	.021 (.018-.023)	.036 (.024-.046)	.047 (.035-.076)	596
20 years and older	99-00	*	< LOD	.100 (.090-.110)	.190 (.170-.220)	.280 (.230-.360)	1259
	01-02	*	< LOD	.110 (.100-.130)	.210 (.180-.250)	.310 (.280-.370)	1549
	03-04	.041 (.038-.045)	.036 (.032-.041)	.072 (.066-.081)	.159 (.137-.174)	.226 (.202-.249)	1291
Gender Males	99-00	*	< LOD	< LOD	.130 (.110-.140)	.190 (.160-.220)	919
	01-02	*	< LOD	.080 (<LOD-.100)	.140 (.120-.170)	.210 (.160-.300)	1075
	03-04	.032 (.029-.035)	.030 (.026-.033)	.054 (.046-.062)	.110 (.083-.125)	.160 (.136-.180)	940
Females	99-00	*	< LOD	.110 (.090-.130)	.210 (.180-.260)	.320 (.260-.410)	1007
	01-02	*	< LOD	.130 (.100-.140)	.240 (.210-.260)	.360 (.300-.380)	1232
	03-04	.042 (.038-.047)	.036 (.030-.043)	.081 (.068-.097)	.176 (.152-.206)	.242 (.217-.290)	947
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	.110 (.090-.130)	.140 (.130-.180)	636
	01-02	*	< LOD	< LOD	.120 (.080-.160)	.180 (.130-.220)	567
	03-04	.022 (.018-.026)	.019 (.016-.024)	.034 (.029-.039)	.069 (.046-.086)	.094 (.075-.117)	426
Non-Hispanic blacks	99-00	*	< LOD	.120 (.080-.150)	.220 (.180-.320)	.400 (.260-.500)	413
	01-02	*	< LOD	.100 (.070-.120)	.210 (.170-.270)	.320 (.230-.460)	515
	03-04	.038 (.031-.046)	.030 (.026-.034)	.074 (.054-.106)	.218 (.133-.277)	.370 (.218-.618)	462
Non-Hispanic whites	99-00	*	< LOD	.090 (<LOD-.100)	.180 (.150-.200)	.250 (.200-.330)	720
	01-02	*	< LOD	.100 (.090-.120)	.210 (.170-.240)	.300 (.270-.360)	1061
	03-04	.038 (.034-.043)	.034 (.029-.040)	.067 (.062-.076)	.143 (.127-.165)	.209 (.178-.234)	878

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3',4,4',5-Pentachlorobiphenyl (PCB 118) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	.012	0.002	9
		07-08	.011	0.002	6
		09-10	13.3	1	10
	20-39	05-06	.025	0.006	12
		07-08	.022	0.002	15
		09-10	26.5	4.6	17
	40-59	05-06	.058	0.013	12
		07-08	.038	0.002	16
		09-10	31.6	4	17
60+	05-06	.090	0.008	15	
	07-08	.099	0.009	23	
	09-10	80.0	7.9	21	
Non-Hispanic White Female	12-19	05-06	.011	0.001	10
		07-08	.011	0.001	7
		09-10	9.75	0.93	8
	20-39	05-06	.019	0.001	16
		07-08	.025	0.004	13
		09-10	15.9	1.1	19
	40-59	05-06	.058	0.007	13
		07-08	.050	0.005	17
		09-10	65.0	14.9	17
	60+	05-06	.158	0.013	17
		07-08	.145	0.019	21
		09-10	118	12	22
Non-Hispanic Black Male	12-19	05-06	.012	0.001	13
		07-08	.010	0.001	6
		09-10	7.66	0.86	5
	20-39	05-06	.016	0.003	6
		07-08	.016	0.002	6
		09-10	22.0	5.2	7
	40-59	05-06	.047	0.012	5
		07-08	.047	0.008	6
		09-10	69.3	13.2	7
	60+	05-06	.117	0.02	5
		07-08	.098	0.011	8
		09-10	88.0	12.5	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3',4,4',5-Pentachlorobiphenyl (PCB 118) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.010	0.001	14
		07-08	.009	0.001	5
		09-10	7.47	1.2	6
	20-39	05-06	.021	0.003	7
		07-08	.017	0.002	8
		09-10	14.6	2.3	7
	40-59	05-06	.075	0.01	7
		07-08	.068	0.012	8
		09-10	94.7	18.8	7
	60+	05-06	** .300	0.091	5
07-08		.208	0.024	7	
09-10		195	25	7	
Mexican American Male	12-19	05-06	.008	0.001	11
		07-08	.008	0.001	6
		09-10	9.03	1.11	8
	20-39	05-06	.015	0.001	9
		07-08	.018	0.002	9
		09-10	14.7	1.7	7
	40-59	05-06	.033	0.003	4
		07-08	.043	0.007	6
		09-10	27.8	3.4	8
	60+	05-06	.059	0.007	4
07-08		.063	0.007	5	
09-10		64.8	7.9	5	
Mexican American Female	12-19	05-06	.007	0	16
		07-08	.006	0.002	5
		09-10	6.67	1.37	7
	20-39	05-06	.013	0.001	9
		07-08	.015	0.001	8
		09-10	10.9	1	10
	40-59	05-06	.050	0.005	6
		07-08	.041	0.006	6
		09-10	37.8	3.9	9
	60+	05-06	.114	0.016	3
07-08		.096	0.018	5	
09-10		83.5	10.3	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3',4,4',5-Pentachlorobiphenyl (PCB 118) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	9.19	0.88	10
	20-39	09-10	18.2	2.3	12
	40-59	09-10	33.5	3.4	13
	60+	09-10	72.1	6.3	8
All Hispanic Female	12-19	09-10	7.81	1.33	10
	20-39	09-10	14.2	2	14
	40-59	09-10	37.2	3.7	14
	60+	09-10	94.4	8.6	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2',3,4,4',5-Pentachlorobiphenyl (PCB 123) (lipid adjusted) (2005 – 2008)††

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Non-Hispanic White Male	12-19	05-06	*	*	9	
		07-08	*	*	6	
	20-39	05-06	*	*	12	
		07-08	*	*	15	
	40-59	05-06	*	*	12	
		07-08	*	*	16	
	60+	05-06	*	*	15	
		07-08	*	*	23	
	Non-Hispanic White Female	12-19	05-06	*	*	10
			07-08	*	*	7
20-39		05-06	*	*	16	
		07-08	*	*	13	
40-59		05-06	*	*	13	
		07-08	*	*	17	
60+		05-06	*	*	17	
		07-08	*	*	21	
Non-Hispanic Black Male		12-19	05-06	*	*	13
			07-08	*	*	6
	20-39	05-06	*	*	6	
		07-08	*	*	6	
	40-59	05-06	*	*	5	
		07-08	*	*	6	
	60+	05-06	*	*	5	
		07-08	*	*	8	
	Non-Hispanic Black Female	12-19	05-06	*	*	14
			07-08	*	*	5
20-39		05-06	*	*	7	
		07-08	*	*	8	
40-59		05-06	*	*	7	
		07-08	*	*	8	
60+		05-06	*	*	5	
		07-08	*	*	7	

††Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06 and 07-08 are 0.31 and 0.3.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2',3,4,4',5-Pentachlorobiphenyl (PCB 123) (lipid adjusted) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Mexican American Male	12-19	05-06	*	*	11	
		07-08	*	*	6	
	20-39	05-06	*	*	9	
		07-08	*	*	9	
	40-59	05-06	*	*	4	
		07-08	*	*	6	
	60+	05-06	*	*	4	
		07-08	*	*	5	
	Mexican American Female	12-19	05-06	*	*	16
			07-08	*	*	5
20-39		05-06	*	*	9	
		07-08	*	*	8	
40-59		05-06	*	*	6	
		07-08	*	*	6	
60+		05-06	*	*	3	
		07-08	*	*	5	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06 and 07-08 are 0.31 and 0.3.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2',3,4,4',5-Pentachlorobiphenyl (PCB 123) (whole weight) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Non-Hispanic White Male	12-19	05-06	*	*	9	
		07-08	*	*	6	
	20-39	05-06	*	*	12	
		07-08	*	*	15	
	40-59	05-06	*	*	12	
		07-08	*	*	16	
	60+	05-06	*	*	15	
		07-08	*	*	23	
	Non-Hispanic White Female	12-19	05-06	*	*	10
			07-08	*	*	7
20-39		05-06	*	*	16	
		07-08	*	*	13	
40-59		05-06	*	*	13	
		07-08	*	*	17	
60+		05-06	*	*	17	
		07-08	*	*	21	
Non-Hispanic Black Male		12-19	05-06	*	*	13
			07-08	*	*	6
	20-39	05-06	*	*	6	
		07-08	*	*	6	
	40-59	05-06	*	*	5	
		07-08	*	*	6	
	60+	05-06	*	*	5	
		07-08	*	*	8	
	Non-Hispanic Black Female	12-19	05-06	*	*	14
			07-08	*	*	5
20-39		05-06	*	*	7	
		07-08	*	*	8	
40-59		05-06	*	*	7	
		07-08	*	*	8	
60+		05-06	*	*	5	
		07-08	*	*	7	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2',3,4,4',5-Pentachlorobiphenyl (PCB 123) (whole weight) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
	20-39	05-06	*	*	9
		07-08	*	*	9
	40-59	05-06	*	*	4
		07-08	*	*	6
60+	05-06	*	*	4	
	07-08	*	*	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
	20-39	05-06	*	*	9
		07-08	*	*	8
	40-59	05-06	*	*	6
		07-08	*	*	6
60+	05-06	*	*	3	
	07-08	*	*	5	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	12.6 (<LOD-13.8)	17.0 (15.5-18.0)	1907
	01-02	*	< LOD	< LOD	14.3 (12.1-16.0)	18.3 (15.6-21.1)	2296
	03-04	2.54 (2.36-2.74)	3.29 (2.90-3.80)	7.00 (6.20-8.07)	11.4 (10.4-12.6)	15.3 (13.8-17.5)	1880
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	665
	01-02	*	< LOD	< LOD	< LOD	< LOD	756
	03-04	*	.500 (<LOD-.660)	1.20 (1.00-1.43)	2.30 (2.06-2.45)	3.00 (2.37-3.60)	586
20 years and older	99-00	*	< LOD	< LOD	13.6 (<LOD-14.7)	17.5 (16.0-20.1)	1242
	01-02	*	< LOD	< LOD	15.0 (13.3-17.0)	19.7 (17.0-22.1)	1540
	03-04	3.31 (3.05-3.60)	4.10 (3.40-4.66)	7.81 (6.80-8.70)	12.0 (10.9-13.5)	16.8 (14.7-18.6)	1294
Gender Males	99-00	*	< LOD	< LOD	12.6 (<LOD-14.0)	17.0 (14.6-18.0)	912
	01-02	*	< LOD	< LOD	13.7 (11.3-16.4)	18.4 (14.3-22.1)	1069
	03-04	2.57 (2.34-2.82)	3.10 (2.80-3.80)	6.92 (5.82-8.00)	11.8 (9.79-14.2)	17.1 (14.7-19.3)	940
Females	99-00	*	< LOD	< LOD	12.8 (<LOD-14.7)	16.5 (15.4-20.7)	995
	01-02	*	< LOD	< LOD	14.8 (13.2-15.5)	18.2 (16.2-21.0)	1227
	03-04	2.51 (2.28-2.76)	3.42 (2.80-4.10)	7.09 (6.35-8.10)	11.1 (10.4-12.0)	14.1 (12.7-16.8)	940
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	631
	01-02	*	< LOD	< LOD	< LOD	< LOD	566
	03-04	.858 (.640-1.15)	1.00 (.700-1.40)	2.48 (1.50-3.60)	4.78 (4.00-5.68)	6.40 (5.40-7.70)	423
Non-Hispanic blacks	99-00	*	< LOD	< LOD	14.6 (<LOD-20.5)	23.1 (17.2-32.1)	412
	01-02	*	< LOD	< LOD	15.5 (12.7-21.0)	23.5 (16.4-31.4)	511
	03-04	2.32 (1.87-2.89)	3.04 (2.40-3.60)	7.40 (5.48-9.80)	14.7 (11.5-18.6)	24.8 (15.0-33.0)	456
Non-Hispanic whites	99-00	*	< LOD	< LOD	13.6 (<LOD-15.2)	17.4 (16.0-18.9)	711
	01-02	*	< LOD	< LOD	15.0 (13.2-17.5)	19.4 (16.2-22.1)	1056
	03-04	3.03 (2.70-3.39)	4.03 (3.15-4.66)	7.76 (6.51-8.79)	11.7 (10.5-13.1)	15.7 (13.5-18.5)	880

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 12.5, 10.5, and 0.4, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	.822	0.123	9
		07-08	.985	0.283	6
		09-10	.827	0.082	10
	20-39	05-06	1.61	0.26	12
		07-08	1.73	0.21	15
		09-10	1.60	0.24	17
	40-59	05-06	5.40	0.36	12
		07-08	5.41	0.32	16
		09-10	4.41	0.36	17
60+	05-06	8.93	0.48	15	
	07-08	11.9	1	23	
	09-10	9.51	0.76	21	
Non-Hispanic White Female	12-19	05-06	.614	0.064	10
		07-08	.751	0.136	7
		09-10	.610	0.127	8
	20-39	05-06	1.08	0.09	16
		07-08	1.50	0.16	13
		09-10	1.16	0.08	19
	40-59	05-06	4.72	0.39	13
		07-08	5.33	0.33	17
		09-10	6.03	0.88	17
	60+	05-06	9.10	0.84	17
		07-08	10.5	0.7	21
		09-10	9.79	0.81	22
Non-Hispanic Black Male	12-19	05-06	.659	0.077	13
		07-08	*	*	6
		09-10	*	*	6
	20-39	05-06	1.35	0.23	6
		07-08	1.35	0.19	6
		09-10	1.36	0.15	6
	40-59	05-06	4.39	0.48	5
		07-08	5.13	0.48	6
		09-10	5.19	0.55	7
	60+	05-06	13.5	1.9	5
		07-08	12.5	1.4	8
		09-10	11.5	0.8	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.383	0.036	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	1.17	0.17	7
		07-08	1.03	0.15	8
		09-10	.955	0.156	7
	40-59	05-06	4.73	0.62	7
		07-08	5.20	0.37	8
		09-10	4.84	0.48	7
	60+	05-06	17.1	3.9	5
07-08		13.0	0.7	7	
09-10		13.6	1.5	7	
Mexican American Male	12-19	05-06	.435	0.073	11
		07-08	.436	0.091	6
		09-10	.544	0.111	8
	20-39	05-06	.809	0.117	9
		07-08	.914	0.147	9
		09-10	.633	0.073	8
	40-59	05-06	2.48	0.24	4
		07-08	4.17	0.83	6
		09-10	2.37	0.15	8
	60+	05-06	5.39	1.05	4
07-08		5.80	0.39	5	
09-10		6.66	0.74	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	.524	0.07	9
		07-08	.700	0.062	8
		09-10	.566	0.067	10
	40-59	05-06	2.45	0.26	6
		07-08	3.02	0.47	6
		09-10	1.98	0.24	9
	60+	05-06	4.81	0.26	3
07-08		5.07	0.65	5	
09-10		5.71	0.81	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	.496	0.084	11
	20-39	09-10	.783	0.087	13
	40-59	09-10	2.74	0.26	13
	60+	09-10	6.78	0.58	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	.676	0.081	14
	40-59	09-10	2.12	0.21	14
	60+	09-10	5.70	0.52	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	.090 (<LOD-.090)	.110 (.100-.130)	1907
	01-02	*	< LOD	< LOD	.100 (.080-.110)	.130 (.110-.140)	2296
	03-04	.016 (.014-.017)	.021 (.018-.024)	.048 (.041-.052)	.075 (.069-.085)	.103 (.094-.112)	1880
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	665
	01-02	*	< LOD	< LOD	< LOD	< LOD	756
	03-04	*	.003 (<LOD-.003)	.006 (.005-.007)	.012 (.011-.012)	.015 (.012-.018)	586
20 years and older	99-00	*	< LOD	< LOD	.090 (<LOD-.100)	.120 (.100-.140)	1242
	01-02	*	< LOD	< LOD	.100 (.090-.120)	.130 (.120-.140)	1540
	03-04	.021 (.019-.023)	.026 (.021-.030)	.051 (.045-.057)	.082 (.072-.093)	.109 (.098-.121)	1294
Gender Males	99-00	*	< LOD	< LOD	.090 (<LOD-.100)	.110 (.090-.130)	912
	01-02	*	< LOD	< LOD	.090 (.080-.120)	.120 (.110-.150)	1069
	03-04	.016 (.014-.018)	.021 (.017-.025)	.045 (.037-.054)	.076 (.068-.094)	.108 (.094-.123)	940
Females	99-00	*	< LOD	< LOD	.090 (<LOD-.090)	.110 (.090-.140)	995
	01-02	*	< LOD	< LOD	.100 (.090-.100)	.130 (.110-.140)	1227
	03-04	.015 (.014-.017)	.020 (.017-.025)	.049 (.044-.052)	.073 (.064-.085)	.101 (.089-.112)	940
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	631
	01-02	*	< LOD	< LOD	< LOD	< LOD	566
	03-04	.005 (.004-.007)	.007 (.004-.009)	.015 (.011-.022)	.036 (.025-.041)	.046 (.037-.070)	423
Non-Hispanic blacks	99-00	*	< LOD	< LOD	.090 (<LOD-.120)	.150 (.110-.190)	412
	01-02	*	< LOD	< LOD	.100 (.080-.130)	.150 (.100-.180)	511
	03-04	.013 (.010-.017)	.018 (.014-.022)	.044 (.032-.056)	.099 (.067-.127)	.166 (.108-.198)	456
Non-Hispanic whites	99-00	*	< LOD	< LOD	.090 (<LOD-.100)	.110 (.100-.130)	711
	01-02	*	< LOD	< LOD	.100 (.090-.120)	.130 (.120-.140)	1056
	03-04	.019 (.017-.021)	.025 (.020-.031)	.051 (.044-.057)	.078 (.069-.089)	.104 (.094-.119)	880

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	.005	0.001	9
		07-08	.005	0.001	6
		09-10	4.38	0.4	10
	20-39	05-06	.012	0.002	12
		07-08	.012	0.002	15
		09-10	10.3	1.3	17
	40-59	05-06	.041	0.003	12
		07-08	.039	0.002	16
		09-10	30.0	2.6	17
60+	05-06	.061	0.003	15	
	07-08	.075	0.006	23	
	09-10	57.3	4.5	21	
Non-Hispanic White Female	12-19	05-06	.003	0	10
		07-08	.004	0.001	7
		09-10	2.96	0.65	8
	20-39	05-06	.007	0.001	16
		07-08	.009	0.001	13
		09-10	6.12	0.43	19
	40-59	05-06	.035	0.004	13
		07-08	.035	0.002	17
		09-10	37.8	5.3	17
	60+	05-06	.066	0.005	17
		07-08	.070	0.004	21
		09-10	60.2	5.4	22
Non-Hispanic Black Male	12-19	05-06	.003	0	13
		07-08	*	*	6
		09-10	*	*	6
	20-39	05-06	.008	0.001	6
		07-08	.008	0.001	6
		09-10	7.27	0.77	6
	40-59	05-06	.028	0.003	5
		07-08	.033	0.003	6
		09-10	31.8	2.9	7
	60+	05-06	.080	0.012	5
		07-08	.076	0.009	8
		09-10	62.0	4.8	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.002	0	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	.007	0.001	7
		07-08	.005	0.001	8
		09-10	4.79	0.81	7
	40-59	05-06	.030	0.004	7
		07-08	.031	0.003	8
		09-10	27.2	2.4	7
	60+	05-06	.114	0.026	5
07-08		.078	0.004	7	
09-10		77.6	7.7	7	
Mexican American Male	12-19	05-06	.002	0	11
		07-08	.002	0.001	6
		09-10	2.56	0.53	8
	20-39	05-06	.006	0.001	9
		07-08	.006	0.001	9
		09-10	3.90	0.54	8
	40-59	05-06	.020	0.002	4
		07-08	.030	0.006	6
		09-10	16.3	1.4	8
	60+	05-06	.039	0.007	4
07-08		.042	0.003	5	
09-10		40.7	3.7	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	.004	0.001	9
		07-08	.004	0	8
		09-10	3.13	0.43	10
	40-59	05-06	.018	0.002	6
		07-08	.020	0.003	6
		09-10	12.9	1.9	9
	60+	05-06	.037	0.004	3
07-08		.035	0.005	5	
09-10		31.4	4.1	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	2.32	0.4	11
	20-39	09-10	5.19	0.88	13
	40-59	09-10	18.6	1.8	13
	60+	09-10	42.4	2.8	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	3.77	0.49	14
	40-59	09-10	13.4	1.4	14
	60+	09-10	33.7	3	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1897
	01-02	*	< LOD	< LOD	< LOD	< LOD	2294
	03-04	.605 (.554-.661)	.800 (.700-.940)	1.73 (1.47-1.93)	2.80 (2.50-3.10)	3.80 (3.36-4.30)	1858
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	654
	01-02	*	< LOD	< LOD	< LOD	< LOD	755
	03-04	*	< LOD	< LOD	.690 (.540-.760)	.980 (.750-1.12)	580
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1243
	01-02	*	< LOD	< LOD	< LOD	< LOD	1539
	03-04	.743 (.675-.817)	.980 (.800-1.10)	1.88 (1.69-2.05)	2.98 (2.68-3.30)	3.97 (3.51-4.59)	1278
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	901
	01-02	*	< LOD	< LOD	< LOD	< LOD	1068
	03-04	.594 (.541-.653)	.750 (.700-.900)	1.65 (1.38-1.88)	2.90 (2.39-3.50)	4.00 (3.57-4.87)	928
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	996
	01-02	*	< LOD	< LOD	< LOD	< LOD	1226
	03-04	.615 (.552-.685)	.890 (.700-1.00)	1.79 (1.60-1.99)	2.70 (2.50-2.91)	3.40 (3.20-3.93)	930
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	622
	01-02	*	< LOD	< LOD	< LOD	< LOD	566
	03-04	*	< LOD	.600 (<LOD-.820)	1.12 (.960-1.32)	1.59 (1.20-1.80)	422
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	405
	01-02	*	< LOD	< LOD	< LOD	< LOD	510
	03-04	.568 (.488-.662)	.720 (.600-.930)	1.80 (1.39-2.26)	3.55 (3.10-4.40)	5.35 (3.60-8.80)	448
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	716
	01-02	*	< LOD	< LOD	< LOD	< LOD	1055
	03-04	.713 (.635-.801)	.980 (.760-1.12)	1.81 (1.58-2.06)	2.86 (2.54-3.27)	3.80 (3.27-4.73)	869

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 12.5, 10.5, and 0.4, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	.367	0.055	12
		07-08	*	*	15
		09-10	*	*	17
	40-59	05-06	1.15	0.07	12
		07-08	1.31	0.09	16
		09-10	.928	0.079	17
60+	05-06	2.03	0.11	15	
	07-08	2.91	0.27	23	
	09-10	2.18	0.2	20	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	*	*	16
		07-08	*	*	13
		09-10	*	*	19
	40-59	05-06	1.06	0.09	13
		07-08	1.38	0.09	17
		09-10	1.38	0.2	17
60+	05-06	2.15	0.21	17	
	07-08	2.72	0.19	21	
	09-10	2.27	0.2	22	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	6
	20-39	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	.988	0.12	5
		07-08	1.30	0.12	6
		09-10	1.26	0.21	7
60+	05-06	3.25	0.45	5	
	07-08	3.26	0.39	8	
	09-10	2.56	0.19	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	1.13	0.16	7
		07-08	1.38	0.11	8
		09-10	1.19	0.12	7
60+	05-06	4.31	1.09	5	
	07-08	3.41	0.19	7	
	09-10	3.29	0.38	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	*	*	9
		07-08	*	*	9
		09-10	*	*	8
	40-59	05-06	.561	0.072	4
		07-08	.979	0.195	6
		09-10	.563	0.035	8
60+	05-06	1.13	0.2	4	
	07-08	1.30	0.07	5	
	09-10	1.57	0.18	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	8
		09-10	*	*	10
	40-59	05-06	.567	0.057	6
		07-08	.756	0.101	6
		09-10	.477	0.046	9
60+	05-06	1.08	0.08	3	
	07-08	1.46	0.26	5	
	09-10	1.36	0.21	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	*	*	13
	40-59	09-10	.643	0.064	13
	60+	09-10	1.59	0.14	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	.500	0.043	14
	60+	09-10	1.37	0.13	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1897
	01-02	*	< LOD	< LOD	< LOD	< LOD	2294
	03-04	.004 (.003-.004)	.005 (.004-.006)	.011 (.010-.013)	.018 (.016-.021)	.024 (.022-.027)	1858
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	654
	01-02	*	< LOD	< LOD	< LOD	< LOD	755
	03-04	*	< LOD	< LOD	.004 (.003-.004)	.005 (.004-.005)	580
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1243
	01-02	*	< LOD	< LOD	< LOD	< LOD	1539
	03-04	.005 (.004-.005)	.006 (.005-.007)	.012 (.011-.014)	.019 (.017-.022)	.026 (.023-.031)	1278
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	901
	01-02	*	< LOD	< LOD	< LOD	< LOD	1068
	03-04	.004 (.003-.004)	.005 (.004-.006)	.011 (.009-.012)	.018 (.016-.022)	.025 (.022-.027)	928
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	996
	01-02	*	< LOD	< LOD	< LOD	< LOD	1226
	03-04	.004 (.003-.004)	.005 (.004-.006)	.012 (.010-.013)	.017 (.016-.020)	.024 (.021-.027)	930
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	622
	01-02	*	< LOD	< LOD	< LOD	< LOD	566
	03-04	*	< LOD	.004 (<LOD-.006)	.008 (.006-.009)	.011 (.009-.014)	422
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	405
	01-02	*	< LOD	< LOD	< LOD	< LOD	510
	03-04	.003 (.003-.004)	.004 (.003-.006)	.011 (.008-.014)	.025 (.016-.031)	.040 (.026-.050)	448
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	716
	01-02	*	< LOD	< LOD	< LOD	< LOD	1055
	03-04	.004 (.004-.005)	.006 (.005-.008)	.012 (.010-.014)	.018 (.016-.021)	.025 (.022-.027)	869

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	.003	0	12
		07-08	*	*	15
		09-10	*	*	17
	40-59	05-06	.009	0.001	12
		07-08	.009	0.001	16
		09-10	6.30	0.56	17
60+	05-06	.014	0.001	15	
	07-08	.018	0.002	23	
	09-10	13.2	1.1	20	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	*	*	16
		07-08	*	*	13
		09-10	*	*	19
	40-59	05-06	.008	0.001	13
		07-08	.009	0.001	17
		09-10	8.60	1.2	17
60+	05-06	.016	0.001	17	
	07-08	.018	0.001	21	
	09-10	13.9	1.3	22	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	6
	20-39	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	.006	0.001	5
		07-08	.008	0.001	6
		09-10	7.66	1.08	7
60+	05-06	.019	0.003	5	
	07-08	.020	0.003	8	
	09-10	13.8	1.1	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	.007	0.001	7
		07-08	.008	0.001	8
		09-10	6.68	0.6	7
	60+	05-06	.029	0.007	5
07-08		.020	0.001	7	
09-10		18.6	1.9	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	*	*	9
		07-08	*	*	9
		09-10	*	*	8
	40-59	05-06	.005	0	4
		07-08	.007	0.001	6
		09-10	3.87	0.32	8
	60+	05-06	.008	0.001	4
07-08		.009	0	5	
09-10		9.56	0.92	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	8
		09-10	*	*	10
	40-59	05-06	.004	0	6
		07-08	.005	0.001	6
		09-10	3.10	0.36	9
	60+	05-06	.008	0	3
07-08		.010	0.002	5	
09-10		7.50	1.04	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	*	*	13
	40-59	09-10	4.34	0.43	13
	60+	09-10	9.91	0.62	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	3.15	0.3	14
	60+	09-10	8.07	0.74	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1908
	01-02	*	< LOD	< LOD	< LOD	< LOD	2298
	03-04	.494 (.441-.553)	.700 (.560-.800)	1.60 (1.40-1.70)	2.99 (2.74-3.36)	4.10 (3.80-4.47)	1864
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	666
	01-02	*	< LOD	< LOD	< LOD	< LOD	758
	03-04	*	< LOD	< LOD	.640 (.500-.770)	.870 (.700-1.10)	584
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1242
	01-02	*	< LOD	< LOD	< LOD	< LOD	1540
	03-04	.592 (.521-.673)	.860 (.700-1.00)	1.72 (1.55-2.03)	3.30 (2.90-3.60)	4.30 (3.90-4.81)	1280
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	908
	01-02	*	< LOD	< LOD	< LOD	< LOD	1069
	03-04	.423 (<LOD-.471)	.500 (.440-.600)	1.33 (1.16-1.60)	2.70 (2.25-3.50)	3.80 (3.50-4.70)	931
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	1000
	01-02	*	< LOD	< LOD	< LOD	< LOD	1229
	03-04	.573 (.492-.669)	.880 (.660-1.06)	1.71 (1.51-2.10)	3.21 (2.82-3.62)	4.30 (3.80-4.70)	933
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	627
	01-02	*	< LOD	< LOD	< LOD	< LOD	564
	03-04	*	< LOD	.600 (.400-.800)	1.20 (.960-1.44)	1.70 (1.30-1.94)	419
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	411
	01-02	*	< LOD	< LOD	< LOD	< LOD	515
	03-04	.521 (.432-.628)	.560 (.460-.800)	1.95 (1.25-2.40)	4.30 (3.27-6.79)	7.90 (4.70-11.8)	451
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	715
	01-02	*	< LOD	< LOD	< LOD	< LOD	1056
	03-04	.538 (.458-.632)	.800 (.600-.990)	1.66 (1.42-1.90)	2.98 (2.70-3.45)	3.94 (3.62-4.47)	875

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 12.4, 10.5, and 0.4, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	.397	0.087	12
		07-08	*	*	15
		09-10	*	*	16
	40-59	05-06	1.07	0.12	12
		07-08	.967	0.07	16
		09-10	.772	0.078	17
	60+	05-06	2.30	0.16	15
		07-08	2.73	0.23	23
		09-10	2.27	0.25	20
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	7
	20-39	05-06	.334	0.026	16
		07-08	*	*	13
		09-10	*	*	19
	40-59	05-06	1.19	0.12	13
		07-08	1.30	0.1	17
		09-10	1.49	0.24	16
	60+	05-06	2.67	0.23	17
		07-08	2.93	0.23	21
		09-10	2.77	0.25	22
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	5
	20-39	05-06	.346	0.065	6
		07-08	*	*	6
		09-10	*	*	6
	40-59	05-06	1.05	0.16	5
		07-08	1.28	0.2	6
		09-10	1.61	0.35	7
	60+	05-06	3.71	0.57	5
		07-08	3.44	0.44	8
		09-10	3.03	0.27	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	.388	0.047	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	1.57	0.19	7
		07-08	1.60	0.21	8
		09-10	1.89	0.42	7
60+	05-06	6.11	1.71	5	
	07-08	4.73	0.3	7	
	09-10	4.92	0.64	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	*	*	9
		07-08	*	*	9
		09-10	*	*	8
	40-59	05-06	.589	0.034	4
		07-08	1.08	0.2	6
		09-10	.555	0.065	8
60+	05-06	1.35	0.26	4	
	07-08	1.55	0.18	5	
	09-10	1.78	0.18	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	8
		09-10	*	*	10
	40-59	05-06	.893	0.088	6
		07-08	1.00	0.13	6
		09-10	.598	0.083	8
60+	05-06	1.69	0.17	3	
	07-08	1.92	0.25	5	
	09-10	1.98	0.27	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	*	*	13
	40-59	09-10	.676	0.076	13
	60+	09-10	1.91	0.15	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	.674	0.089	13
	60+	09-10	1.97	0.17	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1908
	01-02	*	< LOD	< LOD	< LOD	< LOD	2298
	03-04	.003 (.003-.003)	.004 (.003-.005)	.010 (.009-.012)	.020 (.018-.022)	.026 (.024-.027)	1864
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	666
	01-02	*	< LOD	< LOD	< LOD	< LOD	758
	03-04	*	< LOD	< LOD	.004 (.003-.004)	.005 (.004-.005)	584
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1242
	01-02	*	< LOD	< LOD	< LOD	< LOD	1540
	03-04	.004 (.003-.004)	.005 (.004-.006)	.012 (.010-.013)	.021 (.019-.023)	.027 (.025-.030)	1280
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	908
	01-02	*	< LOD	< LOD	< LOD	< LOD	1069
	03-04	.003 (<LOD-.003)	.003 (.003-.004)	.009 (.008-.010)	.018 (.015-.021)	.023 (.021-.026)	931
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	1000
	01-02	*	< LOD	< LOD	< LOD	< LOD	1229
	03-04	.003 (.003-.004)	.005 (.004-.006)	.012 (.010-.013)	.022 (.019-.024)	.027 (.025-.031)	933
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	627
	01-02	*	< LOD	< LOD	< LOD	< LOD	564
	03-04	*	< LOD	.004 (.003-.004)	.009 (.007-.011)	.013 (.010-.015)	419
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	411
	01-02	*	< LOD	< LOD	< LOD	< LOD	515
	03-04	.003 (.002-.004)	.003 (.003-.005)	.012 (.008-.015)	.028 (.019-.042)	.051 (.030-.072)	451
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	715
	01-02	*	< LOD	< LOD	< LOD	< LOD	1056
	03-04	.003 (.003-.004)	.005 (.004-.006)	.011 (.009-.013)	.020 (.018-.022)	.025 (.023-.027)	875

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	.003	0.001	12
		07-08	*	*	15
		09-10	*	*	16
	40-59	05-06	.008	0.001	12
		07-08	.007	0	16
		09-10	5.24	0.55	17
	60+	05-06	.016	0.001	15
		07-08	.017	0.001	23
		09-10	13.6	1.4	20
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	7
	20-39	05-06	.002	0	16
		07-08	*	*	13
		09-10	*	*	19
	40-59	05-06	.009	0.001	13
		07-08	.009	0.001	17
		09-10	9.29	1.4	16
	60+	05-06	.019	0.001	17
		07-08	.020	0.001	21
		09-10	16.9	1.5	22
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	5
	20-39	05-06	.002	0	6
		07-08	*	*	6
		09-10	*	*	6
	40-59	05-06	.007	0.001	5
		07-08	.008	0.001	6
		09-10	9.62	1.73	7
	60+	05-06	.022	0.003	5
		07-08	.021	0.003	8
		09-10	16.3	1.6	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	.002	0	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	.010	0.001	7
		07-08	.010	0.001	8
		09-10	10.5	2.1	7
	60+	05-06	.041	0.011	5
07-08		.028	0.002	7	
09-10		28.1	3.7	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	*	*	9
		07-08	*	*	9
		09-10	*	*	8
	40-59	05-06	.005	0	4
		07-08	.008	0.001	6
		09-10	3.82	0.51	8
	60+	05-06	.010	0.002	4
07-08		.011	0.001	5	
09-10		10.9	1	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	8
		09-10	*	*	10
	40-59	05-06	.007	0.001	6
		07-08	.007	0.001	6
		09-10	3.96	0.68	8
	60+	05-06	.013	0	3
07-08		.013	0.002	5	
09-10		10.9	1.4	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	*	*	13
	40-59	09-10	4.57	0.52	13
	60+	09-10	12.0	0.8	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	4.28	0.6	13
	60+	09-10	11.6	1	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) (lipid adjusted) (2001 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	01-02	*	< LOD	< LOD	< LOD	< LOD	2298
	03-04	*	< LOD	< LOD	.900 (.700-1.16)	1.47 (1.10-2.18)	1817
Age group 12-19 years	01-02	*	< LOD	< LOD	< LOD	< LOD	752
	03-04	*	< LOD	< LOD	< LOD	1.00 (<LOD-3.09)	570
20 years and older	01-02	*	< LOD	< LOD	< LOD	< LOD	1546
	03-04	*	< LOD	< LOD	1.00 (.760-1.20)	1.50 (1.10-2.14)	1247
Gender Males	01-02	*	< LOD	< LOD	< LOD	< LOD	1070
	03-04	*	< LOD	< LOD	1.00 (.800-1.20)	1.54 (1.20-2.23)	903
Females	01-02	*	< LOD	< LOD	< LOD	< LOD	1228
	03-04	*	< LOD	< LOD	.830 (.600-1.14)	1.39 (.890-2.18)	914
Race/ethnicity Mexican Americans	01-02	*	< LOD	< LOD	< LOD	< LOD	564
	03-04	*	< LOD	< LOD	< LOD	.700 (<LOD-1.00)	406
Non-Hispanic blacks	01-02	*	< LOD	< LOD	< LOD	< LOD	514
	03-04	*	< LOD	< LOD	1.20 (.840-1.60)	1.85 (1.20-2.83)	444
Non-Hispanic whites	01-02	*	< LOD	< LOD	< LOD	< LOD	1057
	03-04	*	< LOD	< LOD	.900 (.700-1.26)	1.51 (1.04-2.19)	851

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02 and 03-04 are 10.5 and 0.4.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	*	*	12
		07-08	*	*	15
		09-10	*	*	17
	40-59	05-06	.474	0.075	12
		07-08	.525	0.041	16
		09-10	.449	0.047	17
60+	05-06	.799	0.047	15	
	07-08	1.04	0.06	23	
	09-10	.977	0.07	21	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	*	*	16
		07-08	*	*	13
		09-10	*	*	19
	40-59	05-06	*	*	13
		07-08	.386	0.05	17
		09-10	.479	0.049	17
60+	05-06	.615	0.059	17	
	07-08	.856	0.056	21	
	09-10	.791	0.059	21	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	6
	20-39	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	.423	0.022	5
		07-08	.626	0.056	6
		09-10	.631	0.058	7
60+	05-06	1.11	0.05	5	
	07-08	1.42	0.18	8	
	09-10	1.37	0.11	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	.373	0.073	7
		07-08	.538	0.041	8
		09-10	.469	0.074	7
60+	05-06	1.24	0.24	5	
	07-08	1.21	0.1	7	
	09-10	1.23	0.18	6	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	*	*	9
		07-08	*	*	9
		09-10	*	*	8
	40-59	05-06	*	*	4
		07-08	.445	0.128	6
		09-10	*	*	8
60+	05-06	.506	0.146	4	
	07-08	.729	0.068	5	
	09-10	.730	0.075	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	8
		09-10	*	*	10
	40-59	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	9
60+	05-06	.407	0.015	3	
	07-08	** .819	0.305	5	
	09-10	.555	0.071	6	

† See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	*	*	13
	40-59	09-10	*	*	13
	60+	09-10	.744	0.06	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	*	*	14
	60+	09-10	.512	0.045	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) (whole weight) (2001 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	01-02	*	< LOD	< LOD	< LOD	< LOD	2298
	03-04	*	< LOD	< LOD	.006 (.005-.008)	.010 (.007-.014)	1817
Age group 12-19 years	01-02	*	< LOD	< LOD	< LOD	< LOD	752
	03-04	*	< LOD	< LOD	< LOD	.005 (<LOD-.017)	570
20 years and older	01-02	*	< LOD	< LOD	< LOD	< LOD	1546
	03-04	*	< LOD	< LOD	.006 (.005-.008)	.010 (.007-.014)	1247
Gender Males	01-02	*	< LOD	< LOD	< LOD	< LOD	1070
	03-04	*	< LOD	< LOD	.006 (.005-.009)	.011 (.008-.014)	903
Females	01-02	*	< LOD	< LOD	< LOD	< LOD	1228
	03-04	*	< LOD	< LOD	.005 (.004-.008)	.009 (.006-.014)	914
Race/ethnicity Mexican Americans	01-02	*	< LOD	< LOD	< LOD	< LOD	564
	03-04	*	< LOD	< LOD	< LOD	.005 (<LOD-.007)	406
Non-Hispanic blacks	01-02	*	< LOD	< LOD	< LOD	< LOD	514
	03-04	*	< LOD	< LOD	.008 (.005-.010)	.012 (.007-.016)	444
Non-Hispanic whites	01-02	*	< LOD	< LOD	< LOD	< LOD	1057
	03-04	*	< LOD	< LOD	.006 (.005-.008)	.010 (.007-.014)	851

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	*	*	12
		07-08	*	*	15
		09-10	*	*	17
	40-59	05-06	.004	0.001	12
		07-08	.004	0	16
		09-10	3.04	0.32	17
60+	05-06	.005	0	15	
	07-08	.007	0	23	
	09-10	5.90	0.42	21	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	*	*	16
		07-08	*	*	13
		09-10	*	*	19
	40-59	05-06	*	*	13
		07-08	.003	0	17
		09-10	3.01	0.3	17
60+	05-06	.004	0	17	
	07-08	.006	0	21	
	09-10	4.84	0.39	21	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	6
	20-39	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	.003	0	5
		07-08	.004	0	6
		09-10	3.86	0.3	7
60+	05-06	.007	0	5	
	07-08	.009	0.001	8	
	09-10	7.32	0.63	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	*	*	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	.002	0	7
		07-08	.003	0	8
		09-10	2.63	0.39	7
	60+	05-06	.008	0.002	5
07-08		.007	0.001	7	
09-10		6.97	0.96	6	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	*	*	9
		07-08	*	*	9
		09-10	*	*	8
	40-59	05-06	*	*	4
		07-08	** .003	0.001	6
		09-10	*	*	8
	60+	05-06	.004	0.001	4
07-08		.005	0	5	
09-10		4.47	0.38	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	8
		09-10	*	*	10
	40-59	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	9
	60+	05-06	.003	0	3
07-08		** .006	0.002	5	
09-10		3.07	0.38	6	

† See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	*	*	13
	40-59	09-10	*	*	13
	60+	09-10	4.65	0.28	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	*	*	14
	60+	09-10	3.02	0.23	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/DioxinLikeChemicals_FactSheet.html

Serum 2,4,4'-Trichlorobiphenyl (PCB 28) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1849
	03-04	4.90 (4.60-5.22)	4.96 (4.65-5.26)	6.79 (6.40-7.31)	9.39 (8.70-10.1)	11.3 (10.7-11.8)	1866
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	647
	03-04	5.02 (4.48-5.63)	4.88 (4.26-5.48)	7.20 (5.90-8.60)	10.2 (8.40-11.5)	11.7 (10.7-13.3)	590
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1202
	03-04	4.88 (4.61-5.17)	4.98 (4.67-5.26)	6.78 (6.40-7.25)	9.10 (8.70-9.87)	11.1 (10.6-11.8)	1276
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	886
	03-04	4.81 (4.47-5.16)	4.86 (4.45-5.20)	6.70 (6.07-7.50)	9.39 (8.34-10.4)	10.8 (10.5-11.4)	926
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	963
	03-04	4.99 (4.66-5.35)	5.07 (4.73-5.37)	6.90 (6.49-7.40)	9.37 (8.72-10.1)	11.6 (10.7-13.1)	940
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	618
	03-04	4.95 (4.55-5.38)	4.90 (4.40-5.70)	6.70 (6.07-7.90)	8.94 (8.17-9.70)	10.5 (9.02-14.7)	413
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	392
	03-04	4.95 (4.20-5.84)	5.03 (4.10-5.60)	7.20 (5.62-8.80)	10.2 (8.51-12.4)	13.1 (10.8-15.3)	459
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	687
	03-04	4.89 (4.58-5.22)	4.90 (4.61-5.26)	6.76 (6.33-7.32)	9.40 (8.70-10.3)	11.1 (10.6-11.8)	876

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00 and 03-04 are 32.4 and 1.7.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,4,4'-Trichlorobiphenyl (PCB 28) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	*	*	12
		07-08	.726	0.065	15
		09-10	*	*	17
	40-59	05-06	*	*	12
		07-08	1.05	0.17	16
		09-10	1.08	0.28	17
	60+	05-06	*	*	15
		07-08	1.73	0.15	23
		09-10	1.66	0.16	20
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	1.36	0.38	7
		09-10	*	*	8
	20-39	05-06	*	*	16
		07-08	.942	0.095	13
		09-10	*	*	19
	40-59	05-06	*	*	13
		07-08	1.12	0.1	17
		09-10	1.29	0.15	17
	60+	05-06	2.93	0.33	17
		07-08	2.64	0.32	21
		09-10	2.69	0.36	22
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	6
	20-39	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	*	*	5
		07-08	.865	0.089	6
		09-10	.940	0.103	7
	60+	05-06	2.74	0.55	5
		07-08	1.40	0.19	8
		09-10	1.92	0.35	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 2.54, 0.7, and 0.92, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,4,4'-Trichlorobiphenyl (PCB 28) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	*	*	7
		07-08	.832	0.115	8
		09-10	*	*	7
	40-59	05-06	*	*	7
		07-08	1.38	0.17	8
		09-10	1.71	0.23	7
	60+	05-06	3.81	0.59	5
07-08		**5.42	3.06	7	
09-10		2.01	0.18	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	*	*	9
		07-08	.715	0.091	9
		09-10	*	*	8
	40-59	05-06	*	*	4
		07-08	.988	0.109	6
		09-10	*	*	8
	60+	05-06	*	*	4
07-08		1.26	0.15	5	
09-10		1.36	0.2	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	1.13	0.24	8
		09-10	*	*	10
	40-59	05-06	*	*	6
		07-08	1.04	0.06	6
		09-10	1.04	0.12	9
	60+	05-06	*	*	3
07-08		1.69	0.19	5	
		09-10	1.93	0.35	6

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 2.54, 0.7, and 0.92, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,4,4'-Trichlorobiphenyl (PCB 28) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	*	*	13
	40-59	09-10	*	*	13
	60+	09-10	1.31	0.15	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	.955	0.087	14
	60+	09-10	1.85	0.23	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 2.54, 0.7, and 0.92, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,4,4'-Trichlorobiphenyl (PCB 28) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1849
	03-04	.030 (.028-.032)	.030 (.028-.032)	.041 (.039-.043)	.057 (.055-.060)	.067 (.063-.071)	1866
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	647
	03-04	.025 (.023-.028)	.025 (.021-.028)	.035 (.030-.042)	.051 (.042-.061)	.061 (.051-.070)	590
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1202
	03-04	.031 (.029-.033)	.031 (.029-.032)	.042 (.040-.043)	.058 (.055-.061)	.067 (.063-.071)	1276
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	886
	03-04	.030 (.028-.032)	.030 (.027-.032)	.041 (.037-.044)	.056 (.051-.061)	.065 (.061-.070)	926
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	963
	03-04	.030 (.028-.032)	.030 (.028-.032)	.042 (.039-.044)	.058 (.055-.061)	.070 (.064-.075)	940
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	618
	03-04	.030 (.028-.033)	.031 (.027-.035)	.041 (.036-.044)	.053 (.048-.059)	.063 (.054-.070)	413
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	392
	03-04	.028 (.024-.033)	.029 (.024-.033)	.039 (.034-.047)	.059 (.047-.070)	.070 (.064-.082)	459
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	687
	03-04	.030 (.028-.032)	.030 (.028-.032)	.041 (.039-.043)	.058 (.055-.061)	.068 (.062-.075)	876

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,4,4'-Trichlorobiphenyl (PCB 28) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	*	*	12
		07-08	.005	0	15
		09-10	*	*	17
	40-59	05-06	*	*	12
		07-08	.008	0.001	16
		09-10	7.46	2.02	17
	60+	05-06	*	*	15
		07-08	.011	0.001	23
		09-10	10.0	0.9	20
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	.006	0.002	7
		09-10	*	*	8
	20-39	05-06	*	*	16
		07-08	.006	0.001	13
		09-10	*	*	19
	40-59	05-06	*	*	13
		07-08	.007	0.001	17
		09-10	8.32	1.15	17
	60+	05-06	.021	0.002	17
		07-08	.018	0.002	21
		09-10	15.9	1.9	22
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	6
	20-39	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	*	*	5
		07-08	.005	0.001	6
		09-10	5.77	0.57	7
	60+	05-06	.016	0.003	5
		07-08	.008	0.001	8
		09-10	10.3	1.8	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,4,4'-Trichlorobiphenyl (PCB 28) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	*	*	7
		07-08	.004	0.001	8
		09-10	*	*	7
	40-59	05-06	*	*	7
		07-08	.008	0.001	8
		09-10	9.65	1.3	7
	60+	05-06	.025	0.004	5
07-08		** .033	0.019	7	
09-10		11.5	0.9	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	*	*	9
		07-08	.005	0.001	9
		09-10	*	*	8
	40-59	05-06	*	*	4
		07-08	.007	0.001	6
		09-10	*	*	8
	60+	05-06	*	*	4
07-08		.009	0.001	5	
09-10		8.55	1.51	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	.006	0.001	8
		09-10	*	*	10
	40-59	05-06	*	*	6
		07-08	.007	0	6
		09-10	6.57	0.7	9
	60+	05-06	*	*	3
07-08		.012	0.001	5	
09-10		10.8	2	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,4,4'-Trichlorobiphenyl (PCB 28) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	*	*	13
	40-59	09-10	*	*	13
	60+	09-10	8.36	1.03	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	5.93	0.52	14
	60+	09-10	11.0	1.4	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2'3,5'-Tetrachlorobiphenyl (PCB 44) (lipid adjusted) (2003 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	03-04	2.06 (1.93-2.19)	2.05 (1.90-2.20)	3.03 (2.90-3.20)	4.40 (4.10-4.86)	5.70 (5.40-6.10)	1890
Age group							
12-19 years	03-04	2.45 (2.22-2.70)	2.44 (2.10-2.70)	3.68 (3.19-4.37)	5.78 (5.13-6.30)	7.99 (6.20-9.10)	597
20 years and older	03-04	2.00 (1.88-2.13)	2.00 (1.90-2.11)	2.97 (2.80-3.20)	4.27 (3.85-4.70)	5.44 (5.00-5.89)	1293
Gender							
Males	03-04	2.12 (2.01-2.25)	2.12 (2.00-2.30)	3.11 (2.97-3.31)	4.52 (4.10-5.20)	5.89 (5.38-6.80)	942
Females	03-04	1.99 (1.82-2.18)	1.98 (1.80-2.20)	2.94 (2.72-3.21)	4.30 (3.77-5.05)	5.60 (5.00-6.20)	948
Race/ethnicity							
Mexican Americans	03-04	2.09 (1.88-2.31)	2.10 (1.90-2.39)	3.10 (2.52-3.73)	4.20 (3.30-6.10)	5.69 (3.80-7.40)	427
Non-Hispanic blacks	03-04	2.21 (1.94-2.52)	2.12 (1.80-2.56)	3.18 (2.72-3.94)	4.90 (3.90-6.32)	6.32 (5.01-9.62)	464
Non-Hispanic whites	03-04	2.03 (1.87-2.19)	2.01 (1.90-2.20)	3.07 (2.90-3.29)	4.40 (4.01-4.95)	5.70 (5.25-6.35)	877

Limit of detection (LOD, see Data Analysis section) for Survey year 03-04 is 0.4.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,5'-Tetrachlorobiphenyl (PCB 44) (lipid adjusted) (2005 – 2008)††

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Non-Hispanic White Male	12-19	05-06	*	*	9	
		07-08	*	*	6	
	20-39	05-06	*	*	12	
		07-08	*	*	15	
	40-59	05-06	*	*	12	
		07-08	*	*	16	
	60+	05-06	*	*	15	
		07-08	*	*	23	
	Non-Hispanic White Female	12-19	05-06	*	*	10
			07-08	*	*	7
20-39		05-06	*	*	16	
		07-08	*	*	13	
40-59		05-06	*	*	13	
		07-08	*	*	17	
60+		05-06	*	*	17	
		07-08	*	*	21	
Non-Hispanic Black Male		12-19	05-06	*	*	13
			07-08	*	*	6
	20-39	05-06	*	*	6	
		07-08	*	*	6	
	40-59	05-06	*	*	5	
		07-08	*	*	6	
	60+	05-06	*	*	5	
		07-08	*	*	8	
	Non-Hispanic Black Female	12-19	05-06	*	*	14
			07-08	*	*	5
20-39		05-06	*	*	7	
		07-08	*	*	8	
40-59		05-06	*	*	7	
		07-08	*	*	8	
60+		05-06	*	*	5	
		07-08	*	*	7	

††Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06 and 07-08 are 0.36 and 0.3.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,5'-Tetrachlorobiphenyl (PCB 44) (lipid adjusted) (2005 – 2008)††

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Mexican American Male	12-19	05-06	*	*	11	
		07-08	*	*	6	
	20-39	05-06	*	*	9	
		07-08	*	*	9	
	40-59	05-06	*	*	4	
		07-08	*	*	6	
	60+	05-06	*	*	4	
		07-08	*	*	5	
	Mexican American Female	12-19	05-06	*	*	16
			07-08	*	*	5
20-39		05-06	*	*	9	
		07-08	*	*	8	
40-59		05-06	*	*	6	
		07-08	*	*	6	
60+		05-06	*	*	3	
		07-08	*	*	5	

††Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06 and 07-08 are 0.36 and 0.3.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,5'-Tetrachlorobiphenyl (PCB 44) (whole weight) (2003 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	03-04	.013 (.012-.013)	.013 (.012-.014)	.018 (.017-.020)	.026 (.024-.028)	.032 (.030-.034)	1890
Age group							
12-19 years	03-04	.012 (.011-.014)	.013 (.011-.014)	.019 (.016-.021)	.029 (.024-.031)	.037 (.030-.042)	597
20 years and older	03-04	.013 (.012-.013)	.013 (.012-.014)	.018 (.017-.020)	.025 (.023-.027)	.031 (.029-.034)	1293
Gender							
Males	03-04	.013 (.012-.014)	.013 (.012-.014)	.018 (.017-.020)	.026 (.024-.028)	.034 (.030-.038)	942
Females	03-04	.012 (.011-.013)	.012 (.011-.013)	.018 (.016-.020)	.025 (.023-.028)	.030 (.028-.032)	948
Race/ethnicity							
Mexican Americans	03-04	.013 (.011-.014)	.013 (.011-.014)	.017 (.015-.020)	.023 (.018-.031)	.027 (.021-.049)	427
Non-Hispanic blacks	03-04	.013 (.011-.014)	.012 (.010-.014)	.018 (.015-.022)	.026 (.021-.034)	.035 (.026-.040)	464
Non-Hispanic whites	03-04	.012 (.012-.014)	.012 (.011-.014)	.019 (.017-.020)	.026 (.024-.028)	.032 (.029-.035)	877

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2'3,5'-Tetrachlorobiphenyl (PCB 44) (whole weight) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
	20-39	05-06	*	*	12
		07-08	*	*	15
	40-59	05-06	*	*	12
		07-08	*	*	16
60+	05-06	*	*	15	
	07-08	*	*	23	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
	20-39	05-06	*	*	16
		07-08	*	*	13
	40-59	05-06	*	*	13
		07-08	*	*	17
60+	05-06	*	*	17	
	07-08	*	*	21	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
	20-39	05-06	*	*	6
		07-08	*	*	6
	40-59	05-06	*	*	5
		07-08	*	*	6
60+	05-06	*	*	5	
	07-08	*	*	8	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2'3,5'-Tetrachlorobiphenyl (PCB 44) (whole weight) (2005 – 2008)††

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
	20-39	05-06	*	*	7
		07-08	*	*	8
	40-59	05-06	*	*	7
		07-08	*	*	8
60+	05-06	*	*	5	
	07-08	*	*	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
	20-39	05-06	*	*	9
		07-08	*	*	9
	40-59	05-06	*	*	4
		07-08	*	*	6
60+	05-06	*	*	4	
	07-08	*	*	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
	20-39	05-06	*	*	9
		07-08	*	*	8
	40-59	05-06	*	*	6
		07-08	*	*	6
60+	05-06	*	*	3	
	07-08	*	*	5	

††Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',4,5'-Tetrachlorobiphenyl (PCB 49) (lipid adjusted) (2003 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	03-04	1.29 (1.20-1.39)	1.35 (1.24-1.45)	1.90 (1.80-2.10)	2.80 (2.60-3.08)	3.53 (3.33-3.80)	1876
Age group							
12-19 years	03-04	1.54 (1.37-1.72)	1.59 (1.33-1.80)	2.30 (2.00-2.84)	3.60 (3.10-4.13)	4.66 (3.80-5.73)	590
20 years and older	03-04	1.26 (1.17-1.35)	1.33 (1.22-1.40)	1.90 (1.78-2.03)	2.69 (2.50-2.80)	3.36 (3.15-3.63)	1286
Gender							
Males	03-04	1.36 (1.27-1.45)	1.40 (1.30-1.50)	2.00 (1.90-2.20)	3.00 (2.60-3.23)	3.79 (3.36-4.10)	932
Females	03-04	1.23 (1.12-1.35)	1.30 (1.13-1.40)	1.80 (1.70-2.04)	2.66 (2.38-3.01)	3.39 (3.02-3.73)	944
Race/ethnicity							
Mexican Americans	03-04	1.33 (1.20-1.48)	1.46 (1.20-1.57)	2.00 (1.67-2.30)	2.70 (2.17-3.80)	3.56 (2.63-4.20)	426
Non-Hispanic blacks	03-04	1.40 (1.23-1.59)	1.40 (1.20-1.64)	2.06 (1.70-2.80)	3.23 (2.80-3.70)	3.88 (3.33-5.53)	453
Non-Hispanic whites	03-04	1.26 (1.15-1.38)	1.32 (1.20-1.40)	1.90 (1.78-2.11)	2.77 (2.50-3.10)	3.45 (3.20-3.90)	876

Limit of detection (LOD, see Data Analysis section) for Survey year 03-04 is 0.4.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',4,5'-Tetrachlorobiphenyl (PCB 49) (lipid adjusted) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
	20-39	05-06	*	*	12
		07-08	*	*	15
	40-59	05-06	*	*	12
		07-08	*	*	16
60+	05-06	*	*	15	
	07-08	*	*	23	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
	20-39	05-06	*	*	16
		07-08	*	*	13
	40-59	05-06	*	*	13
		07-08	*	*	17
60+	05-06	*	*	17	
	07-08	*	*	21	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
	20-39	05-06	*	*	6
		07-08	*	*	6
	40-59	05-06	*	*	5
		07-08	*	*	6
60+	05-06	*	*	5	
	07-08	*	*	8	
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
	20-39	05-06	*	*	7
		07-08	*	*	8
	40-59	05-06	*	*	7
		07-08	*	*	8
60+	05-06	*	*	5	
	07-08	*	*	7	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06 and 07-08 are 0.31 and 0.3.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',4,5'-Tetrachlorobiphenyl (PCB 49) (lipid adjusted) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Mexican American Male	12-19	05-06	*	*	11	
		07-08	*	*	6	
	20-39	05-06	*	*	9	
		07-08	*	*	9	
	40-59	05-06	*	*	4	
		07-08	*	*	6	
	60+	05-06	*	*	4	
		07-08	*	*	5	
	Mexican American Female	12-19	05-06	*	*	16
			07-08	*	*	5
20-39		05-06	*	*	9	
		07-08	*	*	8	
40-59		05-06	*	*	6	
		07-08	*	*	6	
60+		05-06	*	*	3	
		07-08	*	*	5	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06 and 07-08 are 0.31 and 0.3.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',4,5'-Tetrachlorobiphenyl (PCB 49) (whole weight) (2003 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	03-04	.008 (.007-.008)	.008 (.007-.009)	.012 (.011-.012)	.016 (.015-.017)	.019 (.018-.021)	1876
Age group							
12-19 years	03-04	.008 (.007-.009)	.008 (.007-.009)	.012 (.010-.013)	.018 (.015-.019)	.022 (.018-.025)	590
20 years and older	03-04	.008 (.007-.008)	.008 (.007-.009)	.012 (.011-.013)	.015 (.015-.017)	.019 (.018-.021)	1286
Gender							
Males	03-04	.008 (.008-.009)	.008 (.008-.009)	.012 (.011-.013)	.017 (.015-.018)	.021 (.019-.022)	932
Females	03-04	.007 (.007-.008)	.008 (.007-.008)	.011 (.010-.012)	.015 (.014-.017)	.018 (.017-.019)	944
Race/ethnicity							
Mexican Americans	03-04	.008 (.007-.009)	.008 (.007-.009)	.011 (.010-.014)	.015 (.012-.018)	.018 (.015-.023)	426
Non-Hispanic blacks	03-04	.008 (.007-.009)	.008 (.007-.009)	.012 (.010-.014)	.017 (.015-.020)	.021 (.017-.026)	453
Non-Hispanic whites	03-04	.008 (.007-.009)	.008 (.007-.009)	.012 (.011-.013)	.016 (.015-.017)	.019 (.018-.021)	876

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',4,5'-Tetrachlorobiphenyl (PCB 49) (whole weight) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
	20-39	05-06	*	*	12
		07-08	*	*	15
	40-59	05-06	*	*	12
		07-08	*	*	16
60+	05-06	*	*	15	
	07-08	*	*	23	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
	20-39	05-06	*	*	16
		07-08	*	*	13
	40-59	05-06	*	*	13
		07-08	*	*	17
60+	05-06	*	*	17	
	07-08	*	*	21	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
	20-39	05-06	*	*	6
		07-08	*	*	6
	40-59	05-06	*	*	5
		07-08	*	*	6
60+	05-06	*	*	5	
	07-08	*	*	8	
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
	20-39	05-06	*	*	7
		07-08	*	*	8
	40-59	05-06	*	*	7
		07-08	*	*	8
60+	05-06	*	*	5	
	07-08	*	*	7	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',4,5'-Tetrachlorobiphenyl (PCB 49) (whole weight) (2005 – 2008)††

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Mexican American Male	12-19	05-06	*	*	11	
		07-08	*	*	6	
	20-39	05-06	*	*	9	
		07-08	*	*	9	
	40-59	05-06	*	*	4	
		07-08	*	*	6	
	60+	05-06	*	*	4	
		07-08	*	*	5	
	Mexican American Female	12-19	05-06	*	*	16
			07-08	*	*	5
20-39		05-06	*	*	9	
		07-08	*	*	8	
40-59		05-06	*	*	6	
		07-08	*	*	6	
60+		05-06	*	*	3	
		07-08	*	*	5	

††Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',5,5'-Tetrachlorobiphenyl (PCB 52) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1912
	01-02	*	< LOD	< LOD	< LOD	16.5 (14.3-17.2)	1537
	03-04	2.66 (2.43-2.91)	2.74 (2.50-3.00)	4.17 (3.72-4.60)	5.91 (5.40-6.67)	7.60 (7.01-8.00)	1897
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	664
	01-02	*	< LOD	< LOD	16.2 (<LOD-23.8)	22.9 (16.9-32.3)	291
	03-04	3.16 (2.81-3.56)	3.22 (2.60-3.96)	5.15 (4.46-5.79)	7.60 (6.55-8.33)	9.20 (7.80-12.5)	597
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1248
	01-02	*	< LOD	< LOD	< LOD	16.0 (13.5-16.9)	1246
	03-04	2.59 (2.36-2.84)	2.70 (2.46-2.92)	4.06 (3.60-4.43)	5.70 (5.16-6.49)	7.15 (6.62-7.80)	1300
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	908
	01-02	*	< LOD	< LOD	< LOD	16.0 (<LOD-17.5)	716
	03-04	2.75 (2.54-2.98)	2.80 (2.55-3.20)	4.36 (3.90-4.88)	5.94 (5.51-6.80)	7.80 (7.29-8.49)	946
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	1004
	01-02	*	< LOD	< LOD	< LOD	16.6 (14.0-18.2)	821
	03-04	2.57 (2.30-2.87)	2.70 (2.40-2.96)	3.96 (3.52-4.30)	5.86 (4.96-6.67)	7.15 (6.57-8.10)	951
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	631
	01-02	*	< LOD	< LOD	< LOD	16.9 (<LOD-20.6)	366
	03-04	2.88 (2.56-3.24)	3.00 (2.70-3.30)	4.41 (3.60-5.30)	6.00 (4.71-8.11)	7.83 (5.70-12.0)	426
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	408
	01-02	*	< LOD	< LOD	< LOD	16.6 (<LOD-20.9)	282
	03-04	2.74 (2.35-3.19)	2.58 (2.08-3.40)	4.11 (3.30-5.60)	6.92 (5.10-8.70)	8.70 (7.10-10.2)	464
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	716
	01-02	*	< LOD	< LOD	< LOD	16.6 (14.7-17.5)	773
	03-04	2.60 (2.35-2.88)	2.70 (2.40-2.98)	4.17 (3.70-4.60)	5.79 (5.20-6.75)	7.37 (6.80-7.87)	885

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 12.5, 12.4, and 0.8, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',5,5'-Tetrachlorobiphenyl (PCB 52) (lipid adjusted) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Non-Hispanic White Male	12-19	05-06	*	*	9	
		07-08	*	*	6	
	20-39	05-06	*	*	12	
		07-08	*	*	15	
	40-59	05-06	*	*	12	
		07-08	*	*	16	
	60+	05-06	*	*	15	
		07-08	*	*	23	
	Non-Hispanic White Female	12-19	05-06	*	*	10
			07-08	*	*	7
20-39		05-06	*	*	16	
		07-08	*	*	13	
40-59		05-06	*	*	13	
		07-08	*	*	17	
60+		05-06	.348	0.071	17	
		07-08	*	*	21	
Non-Hispanic Black Male		12-19	05-06	*	*	13
			07-08	*	*	6
	20-39	05-06	*	*	6	
		07-08	*	*	6	
	40-59	05-06	*	*	5	
		07-08	*	*	6	
	60+	05-06	.562	0.135	5	
		07-08	*	*	8	
	Non-Hispanic Black Female	12-19	05-06	*	*	14
			07-08	*	*	5
20-39		05-06	*	*	7	
		07-08	*	*	8	
40-59		05-06	*	*	7	
		07-08	*	*	8	
60+		05-06	.807	0.149	5	
		07-08	*	*	7	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06 and 07-08 are 0.33 and 0.3.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',5,5'-Tetrachlorobiphenyl (PCB 52) (lipid adjusted) (2005 – 2008)††

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Mexican American Male	12-19	05-06	*	*	11	
		07-08	*	*	6	
	20-39	05-06	*	*	9	
		07-08	*	*	9	
	40-59	05-06	*	*	4	
		07-08	*	*	6	
	60+	05-06	*	*	4	
		07-08	*	*	5	
	Mexican American Female	12-19	05-06	*	*	16
			07-08	*	*	5
20-39		05-06	*	*	9	
		07-08	*	*	8	
40-59		05-06	*	*	6	
		07-08	*	*	6	
60+		05-06	*	*	3	
		07-08	*	*	5	

††Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06 and 07-08 are 0.33 and 0.3.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',5,5'-Tetrachlorobiphenyl (PCB 52) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1912
	01-02	*	< LOD	< LOD	< LOD	.090 (.080-.100)	1537
	03-04	.016 (.015-.018)	.017 (.015-.019)	.024 (.022-.028)	.035 (.032-.037)	.043 (.039-.046)	1897
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	664
	01-02	*	< LOD	< LOD	.080 (<LOD-.100)	.100 (.080-.140)	291
	03-04	.016 (.014-.018)	.017 (.014-.019)	.026 (.022-.029)	.037 (.032-.041)	.042 (.037-.056)	597
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1248
	01-02	*	< LOD	< LOD	< LOD	.090 (.080-.090)	1246
	03-04	.016 (.015-.018)	.017 (.015-.019)	.024 (.022-.028)	.034 (.031-.036)	.043 (.038-.045)	1300
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	908
	01-02	*	< LOD	< LOD	< LOD	.090 (<LOD-.110)	716
	03-04	.017 (.016-.018)	.018 (.016-.020)	.025 (.023-.029)	.036 (.032-.039)	.044 (.040-.048)	946
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	1004
	01-02	*	< LOD	< LOD	< LOD	.090 (.080-.100)	821
	03-04	.016 (.014-.017)	.016 (.014-.018)	.024 (.021-.028)	.033 (.030-.036)	.042 (.036-.046)	951
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	631
	01-02	*	< LOD	< LOD	< LOD	.090 (<LOD-.110)	366
	03-04	.018 (.016-.020)	.018 (.016-.021)	.025 (.022-.030)	.035 (.028-.044)	.044 (.032-.064)	426
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	408
	01-02	*	< LOD	< LOD	< LOD	.090 (<LOD-.110)	282
	03-04	.016 (.014-.018)	.015 (.012-.019)	.022 (.019-.031)	.035 (.029-.043)	.043 (.035-.049)	464
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	716
	01-02	*	< LOD	< LOD	< LOD	.090 (.080-.100)	773
	03-04	.016 (.014-.018)	.017 (.014-.019)	.024 (.022-.028)	.035 (.032-.037)	.043 (.038-.047)	885

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',5,5'-Tetrachlorobiphenyl (PCB 52) (whole weight) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Non-Hispanic White Male	12-19	05-06	*	*	9	
		07-08	*	*	6	
	20-39	05-06	*	*	12	
		07-08	*	*	15	
	40-59	05-06	*	*	12	
		07-08	*	*	16	
	60+	05-06	*	*	15	
		07-08	*	*	23	
	Non-Hispanic White Female	12-19	05-06	*	*	10
			07-08	*	*	7
20-39		05-06	*	*	16	
		07-08	*	*	13	
40-59		05-06	*	*	13	
		07-08	*	*	17	
60+		05-06	.003	0	17	
		07-08	*	*	21	
Non-Hispanic Black Male		12-19	05-06	*	*	13
			07-08	*	*	6
	20-39	05-06	*	*	6	
		07-08	*	*	6	
	40-59	05-06	*	*	5	
		07-08	*	*	6	
	60+	05-06	.003	0.001	5	
		07-08	*	*	8	
	Non-Hispanic Black Female	12-19	05-06	*	*	14
			07-08	*	*	5
20-39		05-06	*	*	7	
		07-08	*	*	8	
40-59		05-06	*	*	7	
		07-08	*	*	8	
60+		05-06	.005	0.001	5	
		07-08	*	*	7	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',5,5'-Tetrachlorobiphenyl (PCB 52) (whole weight) (2005 – 2008)††

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Mexican American Male	12-19	05-06	*	*	11	
		07-08	*	*	6	
	20-39	05-06	*	*	9	
		07-08	*	*	9	
	40-59	05-06	*	*	4	
		07-08	*	*	6	
	60+	05-06	*	*	4	
		07-08	*	*	5	
	Mexican American Female	12-19	05-06	*	*	16
			07-08	*	*	5
20-39		05-06	*	*	9	
		07-08	*	*	8	
40-59		05-06	*	*	6	
		07-08	*	*	6	
60+		05-06	*	*	3	
		07-08	*	*	5	

††Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,3',4,4'-Tetrachlorobiphenyl (PCB 66) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1931
	01-02	*	< LOD	< LOD	< LOD	< LOD	2250
	03-04	1.39 (1.32-1.47)	1.37 (1.30-1.40)	1.97 (1.90-2.10)	3.10 (2.94-3.26)	4.10 (3.90-4.55)	1898
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	671
	01-02	*	< LOD	< LOD	< LOD	< LOD	724
	03-04	1.24 (1.14-1.34)	1.20 (1.10-1.26)	1.76 (1.62-2.00)	2.40 (2.30-2.70)	3.25 (2.70-4.10)	598
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1260
	01-02	*	< LOD	< LOD	< LOD	< LOD	1526
	03-04	1.42 (1.34-1.49)	1.40 (1.30-1.43)	2.00 (1.90-2.12)	3.10 (2.97-3.40)	4.20 (3.90-4.71)	1300
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	919
	01-02	*	< LOD	< LOD	< LOD	< LOD	1047
	03-04	1.29 (1.20-1.39)	1.30 (1.20-1.38)	1.87 (1.72-2.01)	2.70 (2.50-3.00)	3.30 (2.96-3.82)	947
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	1012
	01-02	*	< LOD	< LOD	< LOD	< LOD	1203
	03-04	1.50 (1.42-1.58)	1.41 (1.38-1.50)	2.10 (1.92-2.30)	3.70 (3.20-4.00)	5.08 (4.10-5.46)	951
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	636
	01-02	*	< LOD	< LOD	< LOD	< LOD	548
	03-04	1.19 (1.09-1.30)	1.14 (1.00-1.30)	1.60 (1.48-1.73)	2.23 (1.80-3.20)	3.20 (2.46-3.60)	427
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	414
	01-02	*	< LOD	< LOD	< LOD	< LOD	495
	03-04	1.50 (1.34-1.68)	1.38 (1.21-1.50)	2.31 (1.80-2.80)	3.80 (3.10-4.80)	5.46 (4.30-8.60)	464
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	723
	01-02	*	< LOD	< LOD	< LOD	< LOD	1047
	03-04	1.39 (1.31-1.47)	1.39 (1.30-1.45)	1.96 (1.90-2.10)	3.01 (2.71-3.28)	4.09 (3.70-4.33)	885

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 12.4, 12.4, and 0.8, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,3',4,4'-Tetrachlorobiphenyl (PCB 66) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	.415	0.061	12
		07-08	.389	0.063	15
		09-10	*	*	17
	40-59	05-06	.827	0.138	12
		07-08	.657	0.066	16
		09-10	*	*	17
60+	05-06	**1.42	0.44	15	
	07-08	1.27	0.18	23	
	09-10	1.24	0.12	21	
Non-Hispanic White Female	12-19	05-06	.421	0.04	10
		07-08	.605	0.146	7
		09-10	*	*	8
	20-39	05-06	.471	0.054	16
		07-08	.629	0.157	13
		09-10	*	*	19
	40-59	05-06	.671	0.091	13
		07-08	.750	0.066	17
		09-10	.768	0.072	17
60+	05-06	1.91	0.21	17	
	07-08	1.84	0.21	21	
	09-10	1.68	0.23	22	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	5
	20-39	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	.784	0.154	5
		07-08	.645	0.155	6
		09-10	1.25	0.3	7
60+	05-06	1.49	0.23	5	
	07-08	1.29	0.18	8	
	09-10	1.86	0.32	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.4, 0.3, and 0.69, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,3',4,4'-Tetrachlorobiphenyl (PCB 66) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	.677	0.112	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	1.09	0.1	7
		07-08	1.13	0.21	8
		09-10	1.79	0.44	7
	60+	05-06	3.40	0.95	5
07-08		2.49	0.63	7	
09-10		2.16	0.17	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	.459	0.074	9
		07-08	.414	0.088	9
		09-10	*	*	8
	40-59	05-06	.585	0.103	4
		07-08	** .713	0.223	6
		09-10	*	*	8
	60+	05-06	.702	0.057	4
07-08		.869	0.051	5	
09-10		.922	0.129	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	.597	0.07	8
		09-10	*	*	10
	40-59	05-06	.751	0.095	6
		07-08	.684	0.073	6
		09-10	*	*	9
	60+	05-06	1.32	0.36	3
07-08		1.18	0.14	5	
09-10		1.11	0.14	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.4, 0.3, and 0.69, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,3',4,4'-Tetrachlorobiphenyl (PCB 66) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	*	*	13
	40-59	09-10	*	*	13
	60+	09-10	.882	0.094	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	*	*	14
	60+	09-10	1.13	0.11	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.4, 0.3, and 0.69, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,3',4,4'-Tetrachlorobiphenyl (PCB 66) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1931
	01-02	*	< LOD	< LOD	< LOD	< LOD	2250
	03-04	.008 (.008-.009)	.008 (.008-.009)	.012 (.012-.013)	.019 (.018-.021)	.025 (.024-.030)	1898
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	671
	01-02	*	< LOD	< LOD	< LOD	< LOD	724
	03-04	.006 (.006-.007)	.006 (.005-.007)	.009 (.008-.010)	.013 (.012-.014)	.017 (.013-.019)	598
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1260
	01-02	*	< LOD	< LOD	< LOD	< LOD	1526
	03-04	.009 (.008-.009)	.008 (.008-.009)	.013 (.012-.013)	.020 (.019-.022)	.026 (.024-.032)	1300
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	919
	01-02	*	< LOD	< LOD	< LOD	< LOD	1047
	03-04	.008 (.007-.009)	.008 (.007-.008)	.011 (.010-.013)	.017 (.016-.019)	.020 (.019-.022)	947
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	1012
	01-02	*	< LOD	< LOD	< LOD	< LOD	1203
	03-04	.009 (.009-.010)	.009 (.008-.009)	.013 (.012-.014)	.022 (.021-.024)	.032 (.026-.034)	951
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	636
	01-02	*	< LOD	< LOD	< LOD	< LOD	548
	03-04	.007 (.007-.008)	.007 (.006-.008)	.010 (.009-.011)	.015 (.011-.018)	.018 (.014-.020)	427
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	414
	01-02	*	< LOD	< LOD	< LOD	< LOD	495
	03-04	.009 (.008-.009)	.008 (.007-.009)	.013 (.011-.015)	.022 (.019-.030)	.036 (.024-.070)	464
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	723
	01-02	*	< LOD	< LOD	< LOD	< LOD	1047
	03-04	.009 (.008-.009)	.008 (.008-.009)	.012 (.012-.013)	.019 (.018-.022)	.025 (.023-.030)	885

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,3',4,4'-Tetrachlorobiphenyl (PCB 66) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	.003	0.001	12
		07-08	.003	0	15
		09-10	*	*	17
	40-59	05-06	.006	0.001	12
		07-08	.005	0.001	16
		09-10	*	*	17
60+	05-06	.010	0.003	15	
	07-08	.008	0.001	23	
	09-10	7.51	0.76	21	
Non-Hispanic White Female	12-19	05-06	.002	0	10
		07-08	.003	0.001	7
		09-10	*	*	8
	20-39	05-06	.003	0	16
		07-08	.004	0.001	13
		09-10	*	*	19
	40-59	05-06	.005	0.001	13
		07-08	.005	0	17
		09-10	4.93	0.55	17
	60+	05-06	.014	0.001	17
		07-08	.012	0.001	21
		09-10	10.0	1.2	22
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	5
	20-39	05-06	*	*	6
		07-08	*	*	6
		09-10	*	*	7
	40-59	05-06	.005	0.001	5
		07-08	.004	0.001	6
		09-10	7.58	1.71	7
	60+	05-06	.009	0.001	5
		07-08	.008	0.001	8
		09-10	10.1	1.8	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,3',4,4'-Tetrachlorobiphenyl (PCB 66) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	.004	0.001	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	.007	0.001	7
		07-08	.007	0.001	8
		09-10	9.86	2.16	7
	60+	05-06	.023	0.006	5
		07-08	.015	0.004	7
		09-10	12.4	0.8	7
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	.003	0.001	9
		07-08	.003	0.001	9
		09-10	*	*	8
	40-59	05-06	.005	0.001	4
		07-08	** .005	0.002	6
		09-10	*	*	8
	60+	05-06	.005	0.001	4
		07-08	.006	0	5
		09-10	5.77	0.94	5
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	.003	0	8
		09-10	*	*	10
	40-59	05-06	.006	0.001	6
		07-08	.005	0	6
		09-10	*	*	9
	60+	05-06	.010	0.002	3
		07-08	.008	0.001	5
		09-10	6.18	0.78	6

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,3',4,4'-Tetrachlorobiphenyl (PCB 66) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	*	*	13
	40-59	09-10	*	*	13
	60+	09-10	5.59	0.62	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	*	*	14
	60+	09-10	6.77	0.73	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,4,4',5-Tetrachlorobiphenyl (PCB 74) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	20.8 (17.9-23.4)	29.0 (24.5-32.3)	1924
	01-02	*	< LOD	13.2 (11.0-15.7)	23.5 (20.2-27.7)	33.0 (26.9-38.7)	2307
	03-04	4.81 (4.63-4.99)	4.36 (3.90-4.88)	8.72 (8.30-9.28)	15.8 (14.7-17.7)	22.3 (19.7-25.5)	1898
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	671
	01-02	*	< LOD	< LOD	< LOD	< LOD	758
	03-04	2.20 (2.02-2.39)	2.20 (2.03-2.33)	2.98 (2.80-3.30)	4.19 (3.60-4.73)	5.32 (4.20-6.90)	598
20 years and older	99-00	*	< LOD	12.6 (<LOD-14.4)	22.4 (19.5-25.6)	30.0 (26.2-35.8)	1253
	01-02	*	< LOD	14.7 (12.4-17.1)	25.2 (21.4-28.9)	34.8 (28.8-41.4)	1549
	03-04	5.38 (5.16-5.62)	5.00 (4.60-5.50)	9.60 (8.90-10.6)	17.1 (15.7-18.5)	24.1 (20.8-27.7)	1300
Gender Males	99-00	*	< LOD	< LOD	15.4 (13.0-17.8)	21.6 (18.3-24.4)	915
	01-02	*	< LOD	10.6 (<LOD-12.3)	20.2 (15.4-24.9)	28.8 (20.8-38.2)	1075
	03-04	4.06 (3.82-4.31)	3.62 (3.30-4.00)	6.71 (6.20-7.77)	12.4 (10.8-13.1)	15.8 (14.6-18.5)	947
Females	99-00	*	< LOD	13.9 (<LOD-16.4)	24.6 (21.9-28.5)	31.9 (28.8-40.3)	1009
	01-02	*	< LOD	15.8 (13.5-18.7)	26.1 (23.2-29.3)	35.9 (31.4-41.4)	1232
	03-04	5.65 (5.33-5.98)	5.38 (4.84-5.95)	10.9 (9.30-12.1)	19.1 (17.4-21.1)	27.4 (22.9-29.6)	951
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	15.8 (12.8-18.2)	636
	01-02	*	< LOD	< LOD	13.3 (<LOD-18.1)	19.6 (16.2-23.0)	567
	03-04	2.43 (2.10-2.80)	2.12 (1.90-2.40)	3.34 (2.90-4.16)	6.10 (5.25-7.40)	10.4 (6.61-12.2)	427
Non-Hispanic blacks	99-00	*	< LOD	< LOD	29.0 (18.6-38.4)	43.8 (35.4-64.0)	411
	01-02	*	< LOD	12.0 (<LOD-14.2)	21.7 (16.4-26.9)	31.9 (24.5-41.0)	515
	03-04	4.96 (4.21-5.83)	4.00 (3.45-4.65)	9.17 (6.80-12.4)	23.0 (14.6-35.1)	40.2 (23.0-68.2)	464
Non-Hispanic whites	99-00	*	< LOD	< LOD	21.6 (18.9-24.0)	29.0 (24.3-32.3)	719
	01-02	*	< LOD	14.7 (12.2-17.3)	25.8 (21.3-30.1)	35.9 (29.0-42.5)	1061
	03-04	5.23 (4.98-5.50)	4.91 (4.38-5.65)	9.30 (8.60-10.4)	16.1 (15.1-18.2)	21.9 (19.2-25.2)	885

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 12.4, 10.5, and 0.8, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,4,4',5-Tetrachlorobiphenyl (PCB 74) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	1.84	0.15	9
		07-08	1.75	0.27	6
		09-10	1.68	0.1	10
	20-39	05-06	2.63	0.45	12
		07-08	2.22	0.08	15
		09-10	2.16	0.2	17
	40-59	05-06	5.30	0.32	12
		07-08	4.09	0.24	16
		09-10	3.71	0.55	17
60+	05-06	11.7	1.1	15	
	07-08	10.5	0.9	23	
	09-10	8.72	0.63	21	
Non-Hispanic White Female	12-19	05-06	1.82	0.15	10
		07-08	1.65	0.11	7
		09-10	1.34	0.11	8
	20-39	05-06	2.64	0.17	16
		07-08	2.45	0.3	13
		09-10	1.97	0.1	19
	40-59	05-06	7.21	0.59	13
		07-08	6.25	0.52	17
		09-10	7.47	1.06	17
	60+	05-06	17.8	1.7	17
		07-08	15.8	1.1	21
		09-10	15.5	1.2	22
Non-Hispanic Black Male	12-19	05-06	2.03	0.16	13
		07-08	1.37	0.2	6
		09-10	1.40	0.18	6
	20-39	05-06	2.30	0.31	6
		07-08	1.82	0.17	6
		09-10	1.99	0.15	6
	40-59	05-06	4.49	0.6	5
		07-08	4.41	0.74	6
		09-10	4.48	0.61	7
	60+	05-06	16.5	2.4	5
		07-08	11.5	1.4	8
		09-10	10.3	0.7	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.8, and 0.78, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,4,4',5-Tetrachlorobiphenyl (PCB 74) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	1.34	0.17	14
		07-08	1.03	0.15	5
		09-10	.878	0.102	6
	20-39	05-06	2.89	0.34	7
		07-08	1.83	0.16	8
		09-10	1.69	0.22	7
	40-59	05-06	8.74	1.02	7
		07-08	8.01	1.27	8
		09-10	8.42	1.02	7
	60+	05-06	36.0	9.3	5
07-08		21.5	2.1	7	
09-10		23.2	2.4	7	
Mexican American Male	12-19	05-06	1.22	0.17	11
		07-08	.992	0.124	6
		09-10	1.06	0.14	8
	20-39	05-06	1.57	0.1	9
		07-08	1.55	0.14	9
		09-10	1.16	0.13	8
	40-59	05-06	2.94	0.34	4
		07-08	3.13	0.29	6
		09-10	2.20	0.16	8
	60+	05-06	6.38	0.49	4
07-08		6.54	0.59	5	
09-10		6.84	0.53	5	
Mexican American Female	12-19	05-06	1.08	0.12	16
		07-08	*	*	5
		09-10	.972	0.207	7
	20-39	05-06	1.46	0.17	9
		07-08	1.60	0.14	8
		09-10	1.04	0.09	10
	40-59	05-06	4.28	0.43	6
		07-08	4.65	0.82	6
		09-10	3.21	0.33	9
	60+	05-06	11.9	2.1	3
07-08		9.71	2.27	5	
09-10		10.0	1.8	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.8, and 0.78, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,4,4',5-Tetrachlorobiphenyl (PCB 74) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	1.17	0.18	11
	20-39	09-10	1.29	0.09	13
	40-59	09-10	2.63	0.26	13
	60+	09-10	6.92	0.38	8
All Hispanic Female	12-19	09-10	1.00	0.16	10
	20-39	09-10	1.24	0.11	14
	40-59	09-10	3.13	0.26	14
	60+	09-10	10.5	1.2	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.8, and 0.78, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,4,4',5-Tetrachlorobiphenyl (PCB 74) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	.140 (.120-.150)	.180 (.160-.220)	1924
	01-02	*	< LOD	.090 (.070-.100)	.150 (.140-.180)	.210 (.180-.270)	2307
	03-04	.029 (.028-.031)	.027 (.024-.029)	.058 (.053-.062)	.104 (.093-.121)	.153 (.135-.171)	1898
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	671
	01-02	*	< LOD	< LOD	< LOD	< LOD	758
	03-04	.011 (.010-.012)	.011 (.010-.012)	.015 (.014-.018)	.021 (.019-.025)	.026 (.021-.033)	598
20 years and older	99-00	*	< LOD	.080 (<LOD-.100)	.150 (.140-.160)	.200 (.170-.230)	1253
	01-02	*	< LOD	.100 (.080-.110)	.170 (.140-.190)	.230 (.200-.280)	1549
	03-04	.034 (.032-.035)	.031 (.028-.033)	.064 (.059-.068)	.115 (.103-.128)	.167 (.143-.186)	1300
Gender Males	99-00	*	< LOD	< LOD	.100 (.090-.120)	.150 (.130-.170)	915
	01-02	*	< LOD	.070 (<LOD-.080)	.130 (.100-.170)	.190 (.140-.250)	1075
	03-04	.025 (.023-.027)	.023 (.021-.027)	.043 (.040-.050)	.077 (.067-.087)	.103 (.092-.118)	947
Females	99-00	*	< LOD	.100 (<LOD-.110)	.160 (.140-.180)	.220 (.190-.250)	1009
	01-02	*	< LOD	.100 (.090-.110)	.170 (.150-.190)	.240 (.210-.290)	1232
	03-04	.034 (.032-.037)	.031 (.027-.036)	.071 (.062-.085)	.130 (.120-.143)	.186 (.154-.216)	951
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	.110 (.080-.130)	636
	01-02	*	< LOD	< LOD	.090 (<LOD-.120)	.140 (.110-.160)	567
	03-04	.015 (.013-.017)	.013 (.011-.016)	.022 (.019-.026)	.042 (.032-.054)	.071 (.049-.097)	427
Non-Hispanic blacks	99-00	*	< LOD	< LOD	.170 (.110-.250)	.280 (.220-.420)	411
	01-02	*	< LOD	.070 (<LOD-.080)	.130 (.100-.170)	.200 (.150-.250)	515
	03-04	.028 (.024-.033)	.022 (.019-.025)	.055 (.038-.077)	.153 (.090-.215)	.236 (.143-.337)	464
Non-Hispanic whites	99-00	*	< LOD	< LOD	.150 (.130-.160)	.190 (.160-.210)	719
	01-02	*	< LOD	.100 (.080-.110)	.170 (.140-.200)	.230 (.190-.280)	1061
	03-04	.032 (.030-.034)	.030 (.027-.033)	.064 (.058-.067)	.113 (.096-.123)	.153 (.131-.176)	885

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,4,4',5-Tetrachlorobiphenyl (PCB 74) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	.010	0.001	9
		07-08	.009	0.001	6
		09-10	8.97	0.57	10
	20-39	05-06	.020	0.004	12
		07-08	.015	0.001	15
		09-10	14.2	1.5	17
	40-59	05-06	.040	0.003	12
		07-08	.030	0.002	16
		09-10	25.1	3.8	17
60+	05-06	.079	0.007	15	
	07-08	.066	0.005	23	
	09-10	52.3	3.3	21	
Non-Hispanic White Female	12-19	05-06	.010	0.001	10
		07-08	.008	0	7
		09-10	6.38	0.58	8
	20-39	05-06	.017	0.001	16
		07-08	.015	0.002	13
		09-10	10.5	0.6	19
	40-59	05-06	.054	0.006	13
		07-08	.041	0.004	17
		09-10	47.0	6.6	17
60+	05-06	.129	0.011	17	
	07-08	.106	0.007	21	
	09-10	94.5	7.4	22	
Non-Hispanic Black Male	12-19	05-06	.010	0.001	13
		07-08	.006	0.001	6
		09-10	6.57	1.01	6
	20-39	05-06	.014	0.002	6
		07-08	.010	0.001	6
		09-10	11.2	1	6
	40-59	05-06	.029	0.004	5
		07-08	.028	0.005	6
		09-10	27.2	2.9	7
60+	05-06	.098	0.013	5	
	07-08	.070	0.009	8	
	09-10	55.4	4.3	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,4,4',5-Tetrachlorobiphenyl (PCB 74) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.007	0.001	14
		07-08	.005	0.001	5
		09-10	3.84	0.38	6
	20-39	05-06	.017	0.002	7
		07-08	.009	0.001	8
		09-10	8.38	1.07	7
	40-59	05-06	.057	0.008	7
		07-08	.049	0.008	8
		09-10	47.6	5.9	7
	60+	05-06	.239	0.062	5
07-08		.128	0.01	7	
09-10		132	13	7	
Mexican American Male	12-19	05-06	.007	0.001	11
		07-08	.005	0.001	6
		09-10	4.98	0.66	8
	20-39	05-06	.011	0.001	9
		07-08	.011	0.001	9
		09-10	7.16	0.97	8
	40-59	05-06	.024	0.003	4
		07-08	.022	0.002	6
		09-10	15.2	1.4	8
	60+	05-06	.046	0.005	4
07-08		.046	0.002	5	
09-10		42.3	4	5	
Mexican American Female	12-19	05-06	.006	0.001	16
		07-08	*	*	5
		09-10	4.51	0.93	7
	20-39	05-06	.010	0.001	9
		07-08	.009	0.001	8
		09-10	5.71	0.53	10
	40-59	05-06	.031	0.003	6
		07-08	.031	0.006	6
		09-10	20.8	2.5	9
	60+	05-06	.088	0.008	3
07-08		.067	0.016	5	
09-10		54.9	8.6	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,4,4',5-Tetrachlorobiphenyl (PCB 74) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	5.37	0.72	11
	20-39	09-10	8.34	0.98	13
	40-59	09-10	17.8	1.8	13
	60+	09-10	43.6	2.5	8
All Hispanic Female	12-19	09-10	4.62	0.72	10
	20-39	09-10	6.88	0.67	14
	40-59	09-10	19.7	1.9	14
	60+	09-10	61.9	7	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4,5'-Pentachlorobiphenyl (PCB 87) (lipid adjusted) (2001 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	01-02	*	< LOD	< LOD	< LOD	< LOD	2298
	03-04	.656 (.579-.744)	.900 (.800-.980)	1.32 (1.24-1.46)	2.02 (1.90-2.17)	2.70 (2.40-3.03)	1892
Age group 12-19 years	01-02	*	< LOD	< LOD	< LOD	< LOD	758
	03-04	.706 (.629-.792)	.860 (.800-1.00)	1.56 (1.32-1.69)	2.25 (2.05-2.60)	3.44 (2.27-3.98)	596
20 years and older	01-02	*	< LOD	< LOD	< LOD	< LOD	1540
	03-04	.650 (.568-.742)	.900 (.800-.970)	1.30 (1.22-1.40)	2.00 (1.85-2.17)	2.60 (2.35-2.91)	1296
Gender Males	01-02	*	< LOD	< LOD	< LOD	< LOD	1069
	03-04	.665 (.606-.730)	.900 (.800-.970)	1.40 (1.30-1.50)	2.05 (1.90-2.27)	2.70 (2.33-3.08)	945
Females	01-02	*	< LOD	< LOD	< LOD	< LOD	1229
	03-04	.648 (.545-.771)	.870 (.780-1.00)	1.30 (1.20-1.41)	2.00 (1.84-2.23)	2.60 (2.35-3.08)	947
Race/ethnicity Mexican Americans	01-02	*	< LOD	< LOD	< LOD	< LOD	564
	03-04	.693 (.569-.843)	.840 (.700-1.00)	1.49 (1.14-1.70)	2.00 (1.64-2.40)	2.30 (2.00-3.10)	427
Non-Hispanic blacks	01-02	*	< LOD	< LOD	< LOD	< LOD	515
	03-04	.824 (.723-.939)	1.05 (.950-1.10)	1.70 (1.32-2.10)	2.81 (2.48-3.09)	3.42 (3.00-4.14)	462
Non-Hispanic whites	01-02	*	< LOD	< LOD	< LOD	< LOD	1056
	03-04	.625 (.531-.735)	.830 (.780-.940)	1.30 (1.20-1.40)	1.97 (1.85-2.17)	2.49 (2.30-2.80)	882

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02 and 03-04 are 10.5 and 0.4.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4,5'-Pentachlorobiphenyl (PCB 87) (lipid adjusted) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Non-Hispanic White Male	12-19	05-06	*	*	9	
		07-08	*	*	6	
	20-39	05-06	*	*	12	
		07-08	*	*	15	
	40-59	05-06	*	*	12	
		07-08	*	*	16	
	60+	05-06	*	*	15	
		07-08	*	*	23	
	Non-Hispanic White Female	12-19	05-06	*	*	10
			07-08	*	*	7
20-39		05-06	*	*	16	
		07-08	*	*	13	
40-59		05-06	*	*	13	
		07-08	*	*	17	
60+		05-06	.416	0.073	17	
		07-08	*	*	21	
Non-Hispanic Black Male		12-19	05-06	*	*	13
			07-08	*	*	6
	20-39	05-06	*	*	6	
		07-08	*	*	6	
	40-59	05-06	*	*	5	
		07-08	*	*	6	
	60+	05-06	*	*	5	
		07-08	*	*	8	
	Non-Hispanic Black Female	12-19	05-06	*	*	14
			07-08	*	*	5
20-39		05-06	*	*	7	
		07-08	*	*	8	
40-59		05-06	*	*	7	
		07-08	*	*	8	
60+		05-06	*	*	5	
		07-08	** .847	0.265	7	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06 and 07-08 are 0.31 and 0.3.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4,5'-Pentachlorobiphenyl (PCB 87) (lipid adjusted) (2005 – 2008)††

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
	20-39	05-06	*	*	9
		07-08	*	*	9
	40-59	05-06	*	*	4
		07-08	*	*	6
60+	05-06	*	*	4	
	07-08	*	*	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
	20-39	05-06	*	*	9
		07-08	*	*	8
	40-59	05-06	*	*	6
		07-08	*	*	6
60+	05-06	*	*	3	
	07-08	*	*	5	

††Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06 and 07-08 are 0.31 and 0.3.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4,5'-Pentachlorobiphenyl (PCB 87) (whole weight) (2001 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	01-02	*	< LOD	< LOD	< LOD	< LOD	2298
	03-04	.004 (.004-.005)	.005 (.005-.006)	.008 (.008-.009)	.012 (.012-.013)	.017 (.015-.017)	1892
Age group 12-19 years	01-02	*	< LOD	< LOD	< LOD	< LOD	758
	03-04	.004 (.003-.004)	.005 (.004-.005)	.008 (.007-.008)	.011 (.010-.013)	.016 (.011-.021)	596
20 years and older	01-02	*	< LOD	< LOD	< LOD	< LOD	1540
	03-04	.004 (.004-.005)	.006 (.005-.006)	.008 (.008-.009)	.012 (.011-.014)	.017 (.014-.018)	1296
Gender Males	01-02	*	< LOD	< LOD	< LOD	< LOD	1069
	03-04	.004 (.004-.005)	.006 (.005-.006)	.009 (.008-.009)	.013 (.012-.014)	.017 (.015-.018)	945
Females	01-02	*	< LOD	< LOD	< LOD	< LOD	1229
	03-04	.004 (.003-.005)	.005 (.005-.006)	.008 (.007-.009)	.012 (.011-.013)	.016 (.014-.017)	947
Race/ethnicity Mexican Americans	01-02	*	< LOD	< LOD	< LOD	< LOD	564
	03-04	.004 (.003-.005)	.005 (.004-.006)	.008 (.007-.010)	.011 (.009-.014)	.014 (.011-.022)	427
Non-Hispanic blacks	01-02	*	< LOD	< LOD	< LOD	< LOD	515
	03-04	.005 (.004-.005)	.006 (.006-.006)	.009 (.008-.012)	.015 (.014-.017)	.020 (.017-.027)	462
Non-Hispanic whites	01-02	*	< LOD	< LOD	< LOD	< LOD	1056
	03-04	.004 (.003-.005)	.005 (.005-.006)	.008 (.007-.009)	.012 (.011-.013)	.016 (.014-.017)	882

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4,5'-Pentachlorobiphenyl (PCB 87) (whole weight) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
	20-39	05-06	*	*	12
		07-08	*	*	15
	40-59	05-06	*	*	12
		07-08	*	*	16
60+	05-06	*	*	15	
	07-08	*	*	23	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
	20-39	05-06	*	*	16
		07-08	*	*	13
	40-59	05-06	*	*	13
		07-08	*	*	17
60+	05-06	.003	0	17	
	07-08	*	*	21	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
	20-39	05-06	*	*	6
		07-08	*	*	6
	40-59	05-06	*	*	5
		07-08	*	*	6
60+	05-06	*	*	5	
	07-08	*	*	8	
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
	20-39	05-06	*	*	7
		07-08	*	*	8
	40-59	05-06	*	*	7
		07-08	*	*	8
60+	05-06	*	*	5	
	07-08	.005	0.001	7	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4,5'-Pentachlorobiphenyl (PCB 87) (whole weight) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Mexican American Male	12-19	05-06	*	*	11	
		07-08	*	*	6	
	20-39	05-06	*	*	9	
		07-08	*	*	9	
	40-59	05-06	*	*	4	
		07-08	*	*	6	
	60+	05-06	*	*	4	
		07-08	*	*	5	
	Mexican American Female	12-19	05-06	*	*	16
			07-08	*	*	5
20-39		05-06	*	*	9	
		07-08	*	*	8	
40-59		05-06	*	*	6	
		07-08	*	*	6	
60+		05-06	*	*	3	
		07-08	*	*	5	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',4,4',5-Pentachlorobiphenyl (PCB 99) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	13.1 (<LOD-14.7)	19.1 (16.2-20.6)	1897
	01-02	*	< LOD	< LOD	17.6 (15.3-21.0)	26.3 (22.1-30.5)	2281
	03-04	4.16 (3.82-4.54)	3.79 (3.43-4.10)	6.53 (5.76-7.56)	13.0 (10.5-16.1)	18.0 (16.7-19.4)	1877
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	654
	01-02	*	< LOD	< LOD	< LOD	< LOD	758
	03-04	2.34 (2.08-2.64)	2.30 (2.05-2.60)	3.20 (2.80-3.86)	5.16 (3.80-6.12)	6.00 (4.77-10.0)	587
20 years and older	99-00	*	< LOD	< LOD	13.9 (<LOD-16.0)	20.0 (17.2-21.6)	1243
	01-02	*	< LOD	10.8 (<LOD-12.3)	19.4 (16.7-22.3)	29.0 (23.5-32.1)	1523
	03-04	4.52 (4.14-4.94)	4.08 (3.75-4.45)	7.10 (6.08-8.53)	14.7 (10.9-17.0)	18.6 (17.1-21.3)	1290
Gender Males	99-00	*	< LOD	< LOD	< LOD	16.7 (13.8-20.5)	905
	01-02	*	< LOD	< LOD	17.0 (13.8-21.0)	24.9 (19.8-30.1)	1061
	03-04	3.97 (3.64-4.33)	3.69 (3.31-4.00)	6.11 (5.44-7.00)	11.1 (9.40-14.3)	16.8 (12.9-19.0)	936
Females	99-00	*	< LOD	< LOD	13.9 (<LOD-16.2)	20.3 (17.3-23.5)	992
	01-02	*	< LOD	< LOD	18.0 (15.8-22.2)	28.5 (22.5-33.2)	1220
	03-04	4.35 (3.94-4.81)	3.90 (3.43-4.70)	7.05 (6.00-8.46)	15.3 (11.5-17.3)	18.9 (17.5-22.8)	941
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	624
	01-02	*	< LOD	< LOD	< LOD	13.8 (10.7-17.4)	562
	03-04	2.33 (2.08-2.62)	2.20 (1.90-2.47)	3.35 (2.80-4.02)	5.21 (4.50-6.10)	6.35 (5.53-7.55)	426
Non-Hispanic blacks	99-00	*	< LOD	< LOD	21.1 (17.0-31.1)	32.0 (22.9-57.4)	400
	01-02	*	< LOD	11.7 (10.6-13.1)	22.5 (18.8-25.8)	29.0 (23.0-37.2)	510
	03-04	5.54 (4.53-6.77)	4.81 (3.80-5.80)	10.4 (7.20-15.3)	23.1 (16.7-29.7)	31.7 (24.2-49.1)	447
Non-Hispanic whites	99-00	*	< LOD	< LOD	12.5 (<LOD-14.5)	18.2 (14.3-20.8)	715
	01-02	*	< LOD	< LOD	18.5 (15.3-22.3)	28.5 (22.1-32.4)	1046
	03-04	4.23 (3.80-4.72)	3.90 (3.40-4.44)	6.70 (5.70-8.00)	12.6 (9.73-15.8)	17.3 (15.5-18.1)	883

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 12.5, 10.5, and 0.6, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',4,4',5-Pentachlorobiphenyl (PCB 99) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	1.51	0.17	9
		07-08	1.47	0.16	6
		09-10	1.64	0.1	10
	20-39	05-06	2.60	0.41	12
		07-08	2.29	0.19	15
		09-10	2.58	0.29	17
	40-59	05-06	4.29	0.4	12
		07-08	3.80	0.32	16
		09-10	3.58	0.49	17
60+	05-06	8.00	0.53	15	
	07-08	8.46	0.78	23	
	09-10	6.63	0.59	21	
Non-Hispanic White Female	12-19	05-06	1.30	0.07	10
		07-08	.931	0.206	7
		09-10	1.23	0.12	8
	20-39	05-06	1.86	0.1	16
		07-08	2.06	0.32	13
		09-10	1.83	0.11	19
	40-59	05-06	4.50	0.3	13
		07-08	3.93	0.29	17
		09-10	5.11	0.96	17
60+	05-06	10.0	1	17	
	07-08	8.84	0.87	21	
	09-10	8.72	0.75	22	
Non-Hispanic Black Male	12-19	05-06	2.09	0.22	13
		07-08	1.43	0.13	6
		09-10	1.63	0.17	6
	20-39	05-06	2.46	0.25	6
		07-08	2.18	0.19	6
		09-10	**3.45	1.19	6
	40-59	05-06	5.47	0.79	5
		07-08	6.22	1.22	6
		09-10	8.73	1.52	7
60+	05-06	14.2	1.8	5	
	07-08	11.5	1.2	8	
	09-10	12.8	1.6	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',4,4',5-Pentachlorobiphenyl (PCB 99) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	1.37	0.09	14
		07-08	1.20	0.16	5
		09-10	1.05	0.14	5
	20-39	05-06	2.39	0.25	7
		07-08	1.94	0.26	8
		09-10	2.07	0.28	7
	40-59	05-06	7.60	0.79	7
		07-08	6.43	0.75	8
		09-10	9.98	1.58	7
	60+	05-06	21.5	5.7	5
07-08		17.9	2.9	7	
09-10		15.2	2.3	7	
Mexican American Male	12-19	05-06	.912	0.089	11
		07-08	.810	0.143	6
		09-10	1.19	0.17	8
	20-39	05-06	1.46	0.09	9
		07-08	1.52	0.13	9
		09-10	1.38	0.12	8
	40-59	05-06	2.39	0.15	4
		07-08	3.19	0.52	6
		09-10	2.61	0.33	8
	60+	05-06	4.19	0.31	4
07-08		4.50	0.45	5	
09-10		5.40	0.53	5	
Mexican American Female	12-19	05-06	.816	0.043	16
		07-08	.722	0.075	5
		09-10	.666	0.161	6
	20-39	05-06	1.13	0.12	9
		07-08	1.27	0.07	8
		09-10	.936	0.058	9
	40-59	05-06	3.32	0.33	6
		07-08	2.74	0.26	6
		09-10	2.60	0.21	9
	60+	05-06	5.65	0.74	3
07-08		5.21	1.01	5	
09-10		5.52	0.88	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',4,4',5-Pentachlorobiphenyl (PCB 99) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	1.24	0.13	11
	20-39	09-10	1.64	0.15	13
	40-59	09-10	3.14	0.37	13
	60+	09-10	5.71	0.56	8
All Hispanic Female	12-19	09-10	.858	0.169	9
	20-39	09-10	1.24	0.17	13
	40-59	09-10	2.71	0.21	14
	60+	09-10	5.79	0.54	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',4,4',5-Pentachlorobiphenyl (PCB 99) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	.090 (<LOD-.100)	.120 (.100-.150)	1897
	01-02	*	< LOD	< LOD	.120 (.100-.140)	.180 (.150-.210)	2281
	03-04	.025 (.023-.028)	.024 (.021-.026)	.042 (.038-.049)	.082 (.067-.102)	.119 (.102-.140)	1877
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	654
	01-02	*	< LOD	< LOD	< LOD	< LOD	758
	03-04	.012 (.011-.013)	.012 (.010-.013)	.017 (.015-.019)	.025 (.019-.032)	.032 (.025-.045)	587
20 years and older	99-00	*	< LOD	< LOD	.090 (<LOD-.100)	.130 (.110-.150)	1243
	01-02	*	< LOD	.070 (<LOD-.080)	.130 (.110-.160)	.190 (.160-.210)	1523
	03-04	.028 (.026-.031)	.026 (.024-.028)	.046 (.041-.054)	.093 (.073-.110)	.127 (.110-.153)	1290
Gender Males	99-00	*	< LOD	< LOD	< LOD	.110 (.090-.130)	905
	01-02	*	< LOD	< LOD	.110 (.090-.140)	.160 (.120-.200)	1061
	03-04	.025 (.022-.027)	.023 (.021-.025)	.040 (.036-.045)	.070 (.059-.090)	.110 (.078-.132)	936
Females	99-00	*	< LOD	< LOD	.100 (<LOD-.110)	.130 (.100-.170)	992
	01-02	*	< LOD	< LOD	.130 (.110-.160)	.200 (.160-.210)	1220
	03-04	.026 (.024-.029)	.024 (.020-.028)	.045 (.040-.053)	.095 (.078-.111)	.130 (.110-.158)	941
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	624
	01-02	*	< LOD	< LOD	< LOD	.100 (.070-.120)	562
	03-04	.014 (.012-.016)	.013 (.011-.016)	.022 (.019-.026)	.036 (.030-.040)	.046 (.036-.058)	426
Non-Hispanic blacks	99-00	*	< LOD	< LOD	.140 (.110-.180)	.210 (.150-.400)	400
	01-02	*	< LOD	.070 (.060-.090)	.140 (.110-.150)	.190 (.140-.230)	510
	03-04	.032 (.026-.039)	.027 (.023-.033)	.060 (.042-.086)	.149 (.112-.172)	.211 (.150-.306)	447
Non-Hispanic whites	99-00	*	< LOD	< LOD	.090 (<LOD-.100)	.110 (.090-.150)	715
	01-02	*	< LOD	< LOD	.120 (.100-.160)	.190 (.160-.210)	1046
	03-04	.026 (.023-.029)	.025 (.022-.027)	.043 (.038-.051)	.081 (.065-.102)	.112 (.098-.127)	883

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',4,4',5-Pentachlorobiphenyl (PCB 99) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	.008	0.001	9
		07-08	.007	0.001	6
		09-10	8.80	0.64	10
	20-39	05-06	.019	0.004	12
		07-08	.015	0.002	15
		09-10	16.8	1.9	17
	40-59	05-06	.032	0.003	12
		07-08	.028	0.002	16
		09-10	24.5	3.6	17
60+	05-06	.054	0.003	15	
	07-08	.054	0.005	23	
	09-10	40.3	3.8	21	
Non-Hispanic White Female	12-19	05-06	.007	0	10
		07-08	.004	0.001	7
		09-10	5.88	0.59	8
	20-39	05-06	.012	0.001	16
		07-08	.012	0.002	13
		09-10	9.80	0.67	19
	40-59	05-06	.033	0.003	13
		07-08	.026	0.002	17
		09-10	31.6	5.7	17
	60+	05-06	.072	0.007	17
		07-08	.059	0.006	21
		09-10	52.9	4.4	22
Non-Hispanic Black Male	12-19	05-06	.010	0.001	13
		07-08	.007	0.001	6
		09-10	7.53	1.04	6
	20-39	05-06	.015	0.002	6
		07-08	.012	0.001	6
		09-10	**19.7	6.3	6
	40-59	05-06	.035	0.005	5
		07-08	.040	0.008	6
		09-10	52.6	8.2	7
	60+	05-06	.084	0.009	5
		07-08	.070	0.008	8
		09-10	69.4	9.5	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',4,4',5-Pentachlorobiphenyl (PCB 99) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.007	0	14
		07-08	.006	0.001	5
		09-10	4.61	0.57	5
	20-39	05-06	.014	0.002	7
		07-08	.010	0.001	8
		09-10	10.3	1.4	7
	40-59	05-06	.049	0.006	7
		07-08	.039	0.005	8
		09-10	55.9	8.5	7
	60+	05-06	.144	0.039	5
07-08		.106	0.014	7	
09-10		87.5	14.2	7	
Mexican American Male	12-19	05-06	.005	0	11
		07-08	.004	0.001	6
		09-10	5.64	0.83	8
	20-39	05-06	.010	0.001	9
		07-08	.010	0.001	9
		09-10	8.43	0.91	8
	40-59	05-06	.019	0.002	4
		07-08	.023	0.004	6
		09-10	18.1	2.7	8
	60+	05-06	.031	0.004	4
07-08		.032	0.003	5	
09-10		33.0	2.8	5	
Mexican American Female	12-19	05-06	.004	0	16
		07-08	.003	0	5
		09-10	3.11	0.7	6
	20-39	05-06	.008	0.001	9
		07-08	.007	0.001	8
		09-10	5.14	0.37	9
	40-59	05-06	.024	0.002	6
		07-08	.019	0.002	6
		09-10	16.9	1.8	9
	60+	05-06	.042	0.005	3
07-08		.036	0.007	5	
09-10		30.4	4.3	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',4,4',5-Pentachlorobiphenyl (PCB 99) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	5.78	0.63	11
	20-39	09-10	10.5	1.2	13
	40-59	09-10	21.4	2.6	13
	60+	09-10	35.5	2.5	8
All Hispanic Female	12-19	09-10	3.97	0.78	9
	20-39	09-10	6.91	0.99	13
	40-59	09-10	17.1	1.5	14
	60+	09-10	34.4	3	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',4,5,5'-Pentachlorobiphenyl (PCB 101) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1929
	01-02	*	< LOD	< LOD	< LOD	< LOD	2307
	03-04	1.65 (1.51-1.81)	1.70 (1.50-1.80)	2.70 (2.50-2.94)	4.40 (3.97-4.82)	5.83 (5.29-6.66)	1897
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	669
	01-02	*	< LOD	< LOD	< LOD	< LOD	758
	03-04	1.93 (1.76-2.11)	1.73 (1.51-2.10)	3.20 (3.00-3.60)	5.05 (4.23-5.87)	7.25 (5.10-8.30)	598
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1260
	01-02	*	< LOD	< LOD	< LOD	< LOD	1549
	03-04	1.62 (1.46-1.78)	1.67 (1.50-1.80)	2.64 (2.40-2.90)	4.40 (3.88-4.75)	5.51 (5.00-6.60)	1299
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	918
	01-02	*	< LOD	< LOD	< LOD	< LOD	1075
	03-04	1.71 (1.59-1.84)	1.75 (1.60-1.90)	2.80 (2.60-3.10)	4.50 (3.97-5.06)	6.00 (5.35-6.75)	947
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	1011
	01-02	*	< LOD	< LOD	< LOD	< LOD	1232
	03-04	1.60 (1.41-1.81)	1.61 (1.41-1.82)	2.57 (2.30-2.98)	4.40 (3.71-4.94)	5.60 (4.88-7.25)	950
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	634
	01-02	*	< LOD	< LOD	< LOD	< LOD	567
	03-04	1.72 (1.55-1.92)	1.70 (1.50-1.96)	3.00 (2.30-3.80)	4.40 (3.56-5.38)	5.38 (4.10-6.60)	427
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	413
	01-02	*	< LOD	< LOD	< LOD	< LOD	515
	03-04	1.69 (1.38-2.07)	1.70 (1.50-2.16)	3.00 (2.57-3.80)	5.88 (3.88-7.39)	7.68 (6.60-11.9)	464
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	724
	01-02	*	< LOD	< LOD	< LOD	< LOD	1061
	03-04	1.61 (1.46-1.79)	1.61 (1.41-1.80)	2.60 (2.37-2.90)	4.40 (3.75-4.61)	5.50 (5.00-6.15)	885

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 25.7, 10.5, and 0.6, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',4,5,5'-Pentachlorobiphenyl (PCB 101) (lipid adjusted) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Non-Hispanic White Male	12-19	05-06	*	*	9	
		07-08	*	*	6	
	20-39	05-06	*	*	12	
		07-08	*	*	15	
	40-59	05-06	*	*	12	
		07-08	*	*	16	
	60+	05-06	*	*	15	
		07-08	*	*	23	
	Non-Hispanic White Female	12-19	05-06	*	*	10
			07-08	*	*	7
20-39		05-06	*	*	16	
		07-08	*	*	13	
40-59		05-06	*	*	13	
		07-08	*	*	17	
60+		05-06	.632	0.15	17	
		07-08	*	*	21	
Non-Hispanic Black Male		12-19	05-06	*	*	13
			07-08	*	*	6
	20-39	05-06	*	*	6	
		07-08	*	*	6	
	40-59	05-06	*	*	5	
		07-08	*	*	6	
	60+	05-06	*	*	5	
		07-08	** .608	0.187	8	
	Non-Hispanic Black Female	12-19	05-06	*	*	14
			07-08	*	*	5
20-39		05-06	*	*	7	
		07-08	*	*	8	
40-59		05-06	*	*	7	
		07-08	*	*	8	
60+		05-06	*	*	5	
		07-08	** .954	0.346	7	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06 and 07-08 are 0.59 and 0.3.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',4,5,5'-Pentachlorobiphenyl (PCB 101) (lipid adjusted) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Mexican American Male	12-19	05-06	*	*	11	
		07-08	*	*	6	
	20-39	05-06	*	*	9	
		07-08	*	*	9	
	40-59	05-06	*	*	4	
		07-08	*	*	6	
	60+	05-06	*	*	4	
		07-08	*	*	5	
	Mexican American Female	12-19	05-06	*	*	16
			07-08	*	*	5
20-39		05-06	*	*	9	
		07-08	*	*	8	
40-59		05-06	*	*	6	
		07-08	*	*	6	
60+		05-06	*	*	3	
		07-08	*	*	5	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06 and 07-08 are 0.59 and 0.3.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',4,5,5'-Pentachlorobiphenyl (PCB 101) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1929
	01-02	*	< LOD	< LOD	< LOD	< LOD	2307
	03-04	.010 (.009-.011)	.010 (.009-.012)	.016 (.015-.018)	.027 (.024-.028)	.033 (.031-.037)	1897
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	669
	01-02	*	< LOD	< LOD	< LOD	< LOD	758
	03-04	.010 (.009-.011)	.009 (.008-.011)	.016 (.014-.018)	.024 (.021-.028)	.030 (.025-.044)	598
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1260
	01-02	*	< LOD	< LOD	< LOD	< LOD	1549
	03-04	.010 (.009-.011)	.011 (.009-.012)	.016 (.015-.018)	.027 (.024-.029)	.034 (.031-.037)	1299
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	918
	01-02	*	< LOD	< LOD	< LOD	< LOD	1075
	03-04	.011 (.010-.011)	.011 (.010-.012)	.017 (.016-.019)	.025 (.024-.029)	.037 (.031-.041)	947
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	1011
	01-02	*	< LOD	< LOD	< LOD	< LOD	1232
	03-04	.010 (.009-.011)	.010 (.009-.011)	.015 (.014-.018)	.027 (.022-.029)	.032 (.030-.036)	950
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	634
	01-02	*	< LOD	< LOD	< LOD	< LOD	567
	03-04	.011 (.009-.012)	.011 (.009-.012)	.018 (.014-.021)	.024 (.020-.030)	.029 (.022-.052)	427
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	413
	01-02	*	< LOD	< LOD	< LOD	< LOD	515
	03-04	.010 (.008-.012)	.011 (.008-.013)	.016 (.013-.022)	.032 (.023-.041)	.045 (.032-.059)	464
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	724
	01-02	*	< LOD	< LOD	< LOD	< LOD	1061
	03-04	.010 (.009-.011)	.010 (.009-.011)	.016 (.014-.018)	.025 (.024-.027)	.031 (.029-.037)	885

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',4,5,5'-Pentachlorobiphenyl (PCB 101) (whole weight) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
	20-39	05-06	*	*	12
		07-08	*	*	15
	40-59	05-06	*	*	12
		07-08	*	*	16
60+	05-06	*	*	15	
	07-08	*	*	23	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
	20-39	05-06	*	*	16
		07-08	*	*	13
	40-59	05-06	*	*	13
		07-08	*	*	17
60+	05-06	.005	0.001	17	
	07-08	*	*	21	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
	20-39	05-06	*	*	6
		07-08	*	*	6
	40-59	05-06	*	*	5
		07-08	*	*	6
60+	05-06	*	*	5	
	07-08	.004	0.001	8	
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
	20-39	05-06	*	*	7
		07-08	*	*	8
	40-59	05-06	*	*	7
		07-08	*	*	8
60+	05-06	*	*	5	
	07-08	** .006	0.002	7	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',4,5,5'-Pentachlorobiphenyl (PCB 101) (whole weight) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Mexican American Male	12-19	05-06	*	*	11	
		07-08	*	*	6	
	20-39	05-06	*	*	9	
		07-08	*	*	9	
	40-59	05-06	*	*	4	
		07-08	*	*	6	
	60+	05-06	*	*	4	
		07-08	*	*	5	
	Mexican American Female	12-19	05-06	*	*	16
			07-08	*	*	5
20-39		05-06	*	*	9	
		07-08	*	*	8	
40-59		05-06	*	*	6	
		07-08	*	*	6	
60+		05-06	*	*	3	
		07-08	*	*	5	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,3,3',4',6-Pentachlorobiphenyl (PCB 110) (lipid adjusted) (2001 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	01-02	*	< LOD	< LOD	< LOD	< LOD	2298
	03-04	1.22 (1.11-1.33)	1.20 (1.10-1.36)	1.96 (1.80-2.20)	3.40 (3.10-3.57)	4.42 (3.88-4.95)	1882
Age group 12-19 years	01-02	*	< LOD	< LOD	< LOD	< LOD	758
	03-04	1.44 (1.30-1.59)	1.30 (1.20-1.50)	2.50 (2.19-2.91)	4.13 (3.40-4.90)	5.40 (4.30-7.68)	593
20 years and older	01-02	*	< LOD	< LOD	< LOD	< LOD	1540
	03-04	1.19 (1.08-1.30)	1.20 (1.09-1.33)	1.88 (1.71-2.11)	3.30 (2.95-3.50)	4.18 (3.66-4.94)	1289
Gender Males	01-02	*	< LOD	< LOD	< LOD	< LOD	1069
	03-04	1.26 (1.18-1.35)	1.30 (1.19-1.40)	2.05 (1.80-2.30)	3.42 (3.07-3.70)	4.61 (3.80-5.00)	939
Females	01-02	*	< LOD	< LOD	< LOD	< LOD	1229
	03-04	1.17 (1.04-1.32)	1.20 (1.00-1.36)	1.82 (1.70-2.20)	3.40 (2.77-3.57)	4.40 (3.57-5.54)	943
Race/ethnicity Mexican Americans	01-02	*	< LOD	< LOD	< LOD	< LOD	564
	03-04	1.33 (1.18-1.51)	1.29 (1.13-1.50)	2.30 (1.80-2.95)	3.40 (2.70-4.30)	4.10 (3.30-5.50)	420
Non-Hispanic blacks	01-02	*	< LOD	< LOD	< LOD	< LOD	515
	03-04	1.36 (1.20-1.53)	1.30 (1.14-1.50)	2.10 (1.72-3.00)	4.19 (2.91-5.10)	5.32 (4.40-6.89)	464
Non-Hispanic whites	01-02	*	< LOD	< LOD	< LOD	< LOD	1056
	03-04	1.17 (1.05-1.31)	1.20 (1.00-1.33)	1.86 (1.70-2.16)	3.40 (2.93-3.57)	4.19 (3.69-4.95)	877

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02 and 03-04 are 10.5 and 0.8.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,3,3',4',6-Pentachlorobiphenyl (PCB 110) (lipid adjusted) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Non-Hispanic White Male	12-19	05-06	*	*	9	
		07-08	*	*	6	
	20-39	05-06	*	*	12	
		07-08	*	*	15	
	40-59	05-06	*	*	12	
		07-08	*	*	16	
	60+	05-06	*	*	15	
		07-08	*	*	23	
	Non-Hispanic White Female	12-19	05-06	*	*	10
			07-08	*	*	7
20-39		05-06	*	*	16	
		07-08	*	*	13	
40-59		05-06	*	*	13	
		07-08	*	*	17	
60+		05-06	*	*	17	
		07-08	*	*	21	
Non-Hispanic Black Male		12-19	05-06	*	*	13
			07-08	*	*	6
	20-39	05-06	*	*	6	
		07-08	*	*	6	
	40-59	05-06	*	*	5	
		07-08	*	*	6	
	60+	05-06	.374	0.077	5	
		07-08	*	*	8	
	Non-Hispanic Black Female	12-19	05-06	*	*	14
			07-08	*	*	5
20-39		05-06	*	*	7	
		07-08	*	*	8	
40-59		05-06	*	*	7	
		07-08	*	*	8	
60+		05-06	.315	0.082	5	
		07-08	*	*	7	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06 and 07-08 are 0.31 and 0.3.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,3,3',4',6-Pentachlorobiphenyl (PCB 110) (lipid adjusted) (2005 – 2008)††

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Mexican American Male	12-19	05-06	*	*	11	
		07-08	*	*	6	
	20-39	05-06	*	*	9	
		07-08	*	*	9	
	40-59	05-06	*	*	4	
		07-08	*	*	6	
	60+	05-06	*	*	4	
		07-08	*	*	5	
	Mexican American Female	12-19	05-06	*	*	16
			07-08	*	*	5
20-39		05-06	*	*	9	
		07-08	*	*	8	
40-59		05-06	*	*	6	
		07-08	*	*	6	
60+		05-06	*	*	3	
		07-08	*	*	5	

††Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06 and 07-08 are 0.31 and 0.3.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,3,3',4',6-Pentachlorobiphenyl (PCB 110) (whole weight) (2001 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	01-02	*	< LOD	< LOD	< LOD	< LOD	2298
	03-04	.007 (.007-.008)	.007 (.007-.008)	.012 (.011-.013)	.019 (.018-.021)	.026 (.023-.028)	1882
Age group 12-19 years	01-02	*	< LOD	< LOD	< LOD	< LOD	758
	03-04	.007 (.007-.008)	.007 (.006-.008)	.013 (.010-.015)	.020 (.017-.022)	.026 (.019-.037)	593
20 years and older	01-02	*	< LOD	< LOD	< LOD	< LOD	1540
	03-04	.007 (.007-.008)	.007 (.007-.008)	.012 (.011-.013)	.019 (.017-.021)	.025 (.023-.028)	1289
Gender Males	01-02	*	< LOD	< LOD	< LOD	< LOD	1069
	03-04	.008 (.007-.008)	.008 (.007-.009)	.013 (.011-.014)	.019 (.018-.021)	.028 (.022-.031)	939
Females	01-02	*	< LOD	< LOD	< LOD	< LOD	1229
	03-04	.007 (.006-.008)	.007 (.006-.008)	.011 (.010-.013)	.019 (.016-.022)	.024 (.021-.027)	943
Race/ethnicity Mexican Americans	01-02	*	< LOD	< LOD	< LOD	< LOD	564
	03-04	.008 (.007-.009)	.008 (.007-.010)	.014 (.011-.016)	.019 (.016-.022)	.022 (.017-.043)	420
Non-Hispanic blacks	01-02	*	< LOD	< LOD	< LOD	< LOD	515
	03-04	.008 (.007-.009)	.008 (.006-.009)	.012 (.010-.016)	.023 (.017-.028)	.028 (.023-.032)	464
Non-Hispanic whites	01-02	*	< LOD	< LOD	< LOD	< LOD	1056
	03-04	.007 (.006-.008)	.007 (.006-.008)	.012 (.010-.013)	.019 (.017-.021)	.026 (.022-.029)	877

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,3,3',4',6-Pentachlorobiphenyl (PCB 110) (whole weight) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
	20-39	05-06	*	*	12
		07-08	*	*	15
	40-59	05-06	*	*	12
		07-08	*	*	16
60+	05-06	*	*	15	
	07-08	*	*	23	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
	20-39	05-06	*	*	16
		07-08	*	*	13
	40-59	05-06	*	*	13
		07-08	*	*	17
60+	05-06	*	*	17	
	07-08	*	*	21	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
	20-39	05-06	*	*	6
		07-08	*	*	6
	40-59	05-06	*	*	5
		07-08	*	*	6
60+	05-06	.002	0	5	
	07-08	*	*	8	
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
	20-39	05-06	*	*	7
		07-08	*	*	8
	40-59	05-06	*	*	7
		07-08	*	*	8
60+	05-06	.002	0	5	
	07-08	*	*	7	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,3,3',4',6-Pentachlorobiphenyl (PCB 110) (whole weight) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
	20-39	05-06	*	*	9
		07-08	*	*	9
	40-59	05-06	*	*	4
		07-08	*	*	6
60+	05-06	*	*	4	
	07-08	*	*	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
	20-39	05-06	*	*	9
		07-08	*	*	8
	40-59	05-06	*	*	6
		07-08	*	*	6
60+	05-06	*	*	3	
	07-08	*	*	5	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4'-Hexachlorobiphenyl (PCB 128) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1927
	01-02	*	< LOD	< LOD	< LOD	< LOD	2298
	03-04	*	< LOD	< LOD	< LOD	.600 (.500-.700)	1877
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	668
	01-02	*	< LOD	< LOD	< LOD	< LOD	758
	03-04	*	< LOD	< LOD	< LOD	.510 (<LOD-.700)	589
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1259
	01-02	*	< LOD	< LOD	< LOD	< LOD	1540
	03-04	*	< LOD	< LOD	< LOD	.620 (.490-.800)	1288
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	917
	01-02	*	< LOD	< LOD	< LOD	< LOD	1069
	03-04	*	< LOD	< LOD	< LOD	.600 (.420-.770)	937
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	1010
	01-02	*	< LOD	< LOD	< LOD	< LOD	1229
	03-04	*	< LOD	< LOD	< LOD	.630 (.500-.800)	940
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	636
	01-02	*	< LOD	< LOD	< LOD	< LOD	564
	03-04	*	< LOD	< LOD	< LOD	< LOD	424
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	409
	01-02	*	< LOD	< LOD	< LOD	< LOD	515
	03-04	*	< LOD	< LOD	.670 (.500-.800)	1.00 (.770-2.10)	455
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	725
	01-02	*	< LOD	< LOD	< LOD	< LOD	1056
	03-04	*	< LOD	< LOD	< LOD	.500 (.420-.600)	878

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 12.4, 10.5, and 0.4, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4'-Hexachlorobiphenyl (PCB 128) (lipid adjusted) (2005 – 2008)††

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Non-Hispanic White Male	12-19	05-06	*	*	9	
		07-08	*	*	6	
	20-39	05-06	*	*	12	
		07-08	*	*	15	
	40-59	05-06	*	*	12	
		07-08	*	*	16	
	60+	05-06	*	*	15	
		07-08	*	*	23	
	Non-Hispanic White Female	12-19	05-06	*	*	10
			07-08	*	*	7
20-39		05-06	*	*	16	
		07-08	*	*	13	
40-59		05-06	*	*	13	
		07-08	*	*	17	
60+		05-06	*	*	17	
		07-08	*	*	21	
Non-Hispanic Black Male		12-19	05-06	*	*	13
			07-08	*	*	6
	20-39	05-06	*	*	6	
		07-08	*	*	6	
	40-59	05-06	*	*	5	
		07-08	*	*	6	
	60+	05-06	.410	0.103	5	
		07-08	*	*	8	
	Non-Hispanic Black Female	12-19	05-06	*	*	14
			07-08	*	*	5
20-39		05-06	*	*	7	
		07-08	*	*	8	
40-59		05-06	*	*	7	
		07-08	*	*	8	
60+		05-06	** .367	0.133	5	
		07-08	** .822	0.258	7	

††Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06 and 07-08 are 0.31 and 0.3.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4'-Hexachlorobiphenyl (PCB 128) (lipid adjusted) (2005 – 2008)††

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Mexican American Male	12-19	05-06	*	*	11	
		07-08	*	*	6	
	20-39	05-06	*	*	9	
		07-08	*	*	9	
	40-59	05-06	*	*	4	
		07-08	*	*	6	
	60+	05-06	*	*	4	
		07-08	*	*	5	
	Mexican American Female	12-19	05-06	*	*	16
			07-08	*	*	5
20-39		05-06	*	*	9	
		07-08	*	*	8	
40-59		05-06	*	*	6	
		07-08	*	*	6	
60+		05-06	*	*	3	
		07-08	*	*	5	

††Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06 and 07-08 are 0.31 and 0.3.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4'-Hexachlorobiphenyl (PCB 128) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1927
	01-02	*	< LOD	< LOD	< LOD	< LOD	2298
	03-04	*	< LOD	< LOD	< LOD	.004 (.003-.004)	1877
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	668
	01-02	*	< LOD	< LOD	< LOD	< LOD	758
	03-04	*	< LOD	< LOD	< LOD	.003 (<LOD-.004)	589
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1259
	01-02	*	< LOD	< LOD	< LOD	< LOD	1540
	03-04	*	< LOD	< LOD	< LOD	.004 (.004-.005)	1288
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	917
	01-02	*	< LOD	< LOD	< LOD	< LOD	1069
	03-04	*	< LOD	< LOD	< LOD	.004 (.003-.005)	937
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	1010
	01-02	*	< LOD	< LOD	< LOD	< LOD	1229
	03-04	*	< LOD	< LOD	< LOD	.004 (.003-.005)	940
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	636
	01-02	*	< LOD	< LOD	< LOD	< LOD	564
	03-04	*	< LOD	< LOD	< LOD	< LOD	424
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	409
	01-02	*	< LOD	< LOD	< LOD	< LOD	515
	03-04	*	< LOD	< LOD	< LOD	.004 (.003-.005) .006 (.005-.013)	455
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	725
	01-02	*	< LOD	< LOD	< LOD	< LOD	1056
	03-04	*	< LOD	< LOD	< LOD	.003 (.002-.004)	878

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4'-Hexachlorobiphenyl (PCB 128) (whole weight) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
	20-39	05-06	*	*	12
		07-08	*	*	15
	40-59	05-06	*	*	12
		07-08	*	*	16
60+	05-06	*	*	15	
	07-08	*	*	23	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
	20-39	05-06	*	*	16
		07-08	*	*	13
	40-59	05-06	*	*	13
		07-08	*	*	17
60+	05-06	*	*	17	
	07-08	*	*	21	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
	20-39	05-06	*	*	6
		07-08	*	*	6
	40-59	05-06	*	*	5
		07-08	*	*	6
60+	05-06	.003	0.001	5	
	07-08	*	*	8	
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
	20-39	05-06	*	*	7
		07-08	*	*	8
	40-59	05-06	*	*	7
		07-08	*	*	8
60+	05-06	** .002	0.001	5	
	07-08	.005	0.001	7	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4'-Hexachlorobiphenyl (PCB 128) (whole weight) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
	20-39	05-06	*	*	9
		07-08	*	*	9
	40-59	05-06	*	*	4
		07-08	*	*	6
60+	05-06	*	*	4	
	07-08	*	*	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
	20-39	05-06	*	*	9
		07-08	*	*	8
	40-59	05-06	*	*	6
		07-08	*	*	6
60+	05-06	*	*	3	
	07-08	*	*	5	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4,4',5' & 2,3,3',4,4',6-Hexachlorobiphenyl (PCB 138 & 158) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	49.3 (42.9-55.8)	71.2 (59.8-82.7)	1930
	01-02	19.9 (18.0-22.0)	20.2 (18.2-23.1)	40.4 (35.3-45.1)	70.1 (61.8-78.8)	94.6 (82.5-107)	2293
	03-04	15.1 (14.1-16.1)	15.1 (13.6-16.6)	30.5 (28.1-34.0)	55.4 (47.3-63.3)	75.3 (69.0-81.8)	1896
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	669
	01-02	*	< LOD	< LOD	17.0 (13.7-20.2)	23.1 (17.7-41.2)	748
	03-04	4.97 (4.45-5.55)	4.57 (4.10-5.02)	7.39 (6.35-8.63)	12.7 (10.4-14.5)	15.2 (13.1-21.3)	598
20 years and older	99-00	*	< LOD	< LOD	54.7 (47.4-60.8)	72.8 (66.0-88.9)	1261
	01-02	23.3 (21.1-25.8)	24.0 (21.4-26.8)	44.6 (40.4-49.2)	73.9 (66.2-83.0)	100 (88.8-109)	1545
	03-04	17.7 (16.5-19.0)	17.6 (15.5-20.4)	34.3 (30.0-38.8)	59.6 (50.6-66.9)	77.4 (72.3-87.7)	1298
Gender Males	99-00	*	< LOD	< LOD	47.2 (<LOD-55.7)	68.2 (55.7-83.8)	918
	01-02	20.1 (17.9-22.6)	20.5 (17.6-23.5)	39.2 (32.2-46.0)	69.2 (58.1-82.5)	94.6 (77.8-109)	1066
	03-04	14.9 (13.8-15.9)	14.4 (12.9-15.8)	29.6 (26.6-33.8)	56.3 (45.3-62.3)	75.8 (63.3-87.7)	947
Females	99-00	*	< LOD	< LOD	53.7 (44.7-61.2)	72.1 (61.2-88.9)	1012
	01-02	19.7 (17.8-21.7)	20.2 (18.2-23.1)	41.8 (37.5-45.9)	70.1 (63.4-78.5)	93.9 (80.2-109)	1227
	03-04	15.3 (14.0-16.8)	15.8 (14.2-17.8)	31.8 (28.3-36.6)	54.6 (47.3-64.4)	72.5 (68.4-80.9)	949
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	636
	01-02	*	< LOD	18.6 (13.6-23.4)	33.3 (26.5-44.2)	51.8 (42.3-57.6)	559
	03-04	7.06 (6.02-8.28)	6.52 (5.20-7.60)	12.3 (8.91-16.0)	23.6 (18.9-28.3)	29.2 (24.7-36.1)	427
Non-Hispanic blacks	99-00	*	< LOD	< LOD	72.6 (61.7-89.4)	122 (86.5-185)	412
	01-02	22.3 (19.3-25.6)	22.0 (18.4-27.1)	46.5 (38.0-55.6)	91.5 (70.1-112)	122 (91.5-169)	513
	03-04	17.8 (14.9-21.3)	15.9 (12.5-21.0)	41.2 (30.6-57.3)	86.5 (69.4-110)	153 (94.6-191)	464
Non-Hispanic whites	99-00	*	< LOD	< LOD	49.3 (41.4-55.8)	70.1 (55.7-85.2)	727
	01-02	21.5 (19.2-24.0)	22.1 (19.6-24.9)	43.0 (37.7-48.0)	70.7 (62.3-79.7)	96.1 (79.1-110)	1057
	03-04	16.0 (14.5-17.7)	15.8 (14.6-18.4)	31.4 (28.2-36.6)	55.1 (47.2-62.3)	71.6 (64.0-75.8)	883

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 41.1, 10.5, and 0.4, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4,4',5' & 2,3,3',4,4',6-Hexachlorobiphenyl (PCB 138 & 158) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	4.13	0.65	9
		07-08	4.81	0.89	6
		09-10	4.60	0.42	10
	20-39	05-06	7.98	1.5	12
		07-08	8.74	0.84	15
		09-10	7.79	1.02	17
	40-59	05-06	19.6	2.5	12
		07-08	20.7	1.6	16
		09-10	20.0	2.4	17
60+	05-06	32.6	1.5	15	
	07-08	47.5	3.9	23	
	09-10	36.4	3.3	21	
Non-Hispanic White Female	12-19	05-06	3.24	0.3	10
		07-08	3.53	0.73	7
		09-10	3.72	0.7	8
	20-39	05-06	5.23	0.28	16
		07-08	7.85	1.28	13
		09-10	6.31	0.4	19
	40-59	05-06	16.5	1.2	13
		07-08	21.5	1.2	17
		09-10	21.5	3.2	17
	60+	05-06	33.5	3.1	17
		07-08	45.0	3.3	21
		09-10	38.1	2.9	22
Non-Hispanic Black Male	12-19	05-06	4.83	0.62	13
		07-08	4.63	0.64	6
		09-10	4.55	0.72	5
	20-39	05-06	7.69	1.17	6
		07-08	7.95	0.77	6
		09-10	10.8	2.6	6
	40-59	05-06	20.9	2.4	5
		07-08	28.6	4.5	6
		09-10	29.8	4.2	7
	60+	05-06	56.5	7.5	5
		07-08	68.2	8	8
		09-10	56.5	6.2	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4,4',5' & 2,3,3',4,4',6-Hexachlorobiphenyl (PCB 138 & 158) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	2.97	0.19	14
		07-08	3.25	0.5	5
		09-10	2.68	0.24	5
	20-39	05-06	6.94	0.87	7
		07-08	7.16	0.93	8
		09-10	6.56	0.92	7
	40-59	05-06	25.5	2.5	7
		07-08	28.2	2.8	8
		09-10	31.7	4.8	7
60+	05-06	81.1	23.7	5	
	07-08	79.9	7.1	7	
	09-10	66.3	10	7	
Mexican American Male	12-19	05-06	2.68	0.35	11
		07-08	2.58	0.55	6
		09-10	3.09	0.41	8
	20-39	05-06	4.46	0.27	9
		07-08	5.67	0.55	9
		09-10	4.11	0.53	8
	40-59	05-06	9.75	0.58	4
		07-08	15.2	2	6
		09-10	11.1	0.8	8
60+	05-06	19.6	3	4	
	07-08	23.9	3.3	5	
	09-10	26.3	3.1	5	
Mexican American Female	12-19	05-06	1.92	0.19	16
		07-08	1.84	0.53	5
		09-10	2.31	0.39	7
	20-39	05-06	3.22	0.4	9
		07-08	4.41	0.22	8
		09-10	4.02	0.33	10
	40-59	05-06	12.5	1	6
		07-08	14.6	1.9	6
		09-10	12.4	1.1	9
60+	05-06	21.7	2.3	3	
	07-08	25.6	4	5	
	09-10	32.2	4.6	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4,4',5' & 2,3,3',4,4',6-Hexachlorobiphenyl (PCB 138 & 158) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	3.17	0.3	11
	20-39	09-10	5.09	0.55	13
	40-59	09-10	13.8	1.6	13
	60+	09-10	30.2	3.6	8
All Hispanic Female	12-19	09-10	2.53	0.33	10
	20-39	09-10	4.45	0.38	14
	40-59	09-10	12.5	1.1	14
	60+	09-10	29.8	2.8	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4,4',5' & 2,3,3',4,4',6-Hexachlorobiphenyl (PCB 138 & 158) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	.340 (.300-.370)	.460 (.390-.530)	1930
	01-02	.122 (.110-.135)	.120 (.110-.140)	.270 (.230-.290)	.460 (.410-.510)	.650 (.560-.700)	2293
	03-04	.092 (.086-.099)	.095 (.082-.105)	.206 (.180-.231)	.359 (.326-.392)	.477 (.450-.528)	1896
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	669
	01-02	*	< LOD	< LOD	.090 (.060-.110)	.110 (.090-.210)	748
	03-04	.025 (.023-.028)	.023 (.020-.027)	.037 (.030-.047)	.062 (.049-.074)	.079 (.067-.103)	598
20 years and older	99-00	*	< LOD	< LOD	.360 (.320-.390)	.490 (.400-.560)	1261
	01-02	.148 (.133-.163)	.150 (.140-.170)	.290 (.270-.320)	.510 (.450-.550)	.680 (.610-.720)	1545
	03-04	.111 (.103-.120)	.114 (.099-.128)	.232 (.204-.256)	.383 (.354-.416)	.506 (.467-.594)	1298
Gender Males	99-00	*	< LOD	< LOD	.320 (<LOD-.370)	.420 (.370-.530)	918
	01-02	.125 (.112-.140)	.130 (.110-.140)	.260 (.230-.290)	.460 (.370-.540)	.630 (.510-.710)	1066
	03-04	.092 (.085-.099)	.091 (.079-.103)	.198 (.172-.229)	.354 (.316-.379)	.474 (.389-.562)	947
Females	99-00	*	< LOD	< LOD	.340 (.300-.370)	.490 (.390-.540)	1012
	01-02	.119 (.107-.132)	.120 (.110-.150)	.270 (.230-.300)	.460 (.420-.500)	.660 (.590-.700)	1227
	03-04	.093 (.084-.102)	.098 (.085-.115)	.212 (.178-.244)	.373 (.325-.417)	.482 (.450-.568)	949
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	636
	01-02	*	< LOD	.110 (.090-.150)	.240 (.170-.330)	.350 (.270-.430)	559
	03-04	.043 (.036-.051)	.040 (.032-.049)	.080 (.068-.100)	.148 (.122-.203)	.239 (.147-.346)	427
Non-Hispanic blacks	99-00	*	< LOD	< LOD	.470 (.360-.670)	.830 (.530-1.22)	412
	01-02	.125 (.108-.146)	.130 (.090-.160)	.290 (.230-.350)	.560 (.420-.680)	.770 (.560-1.06)	513
	03-04	.101 (.084-.122)	.087 (.068-.113)	.239 (.186-.326)	.568 (.424-.811)	.965 (.698-1.09)	464
Non-Hispanic whites	99-00	*	< LOD	< LOD	.340 (.300-.370)	.440 (.370-.530)	727
	01-02	.133 (.119-.149)	.140 (.120-.160)	.280 (.250-.300)	.460 (.420-.530)	.650 (.550-.720)	1057
	03-04	.099 (.089-.109)	.104 (.091-.121)	.216 (.179-.252)	.355 (.320-.390)	.467 (.410-.520)	883

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4,4',5' & 2,3,3',4,4',6-Hexachlorobiphenyl (PCB 138 & 158) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	.023	0.003	9
		07-08	.024	0.004	6
		09-10	24.6	2.3	10
	20-39	05-06	.060	0.013	12
		07-08	.058	0.006	15
		09-10	50.4	6.1	17
	40-59	05-06	.150	0.022	12
		07-08	.150	0.01	16
		09-10	136	18	17
60+	05-06	.221	0.008	15	
	07-08	.303	0.023	23	
	09-10	222	21	21	
Non-Hispanic White Female	12-19	05-06	.017	0.002	10
		07-08	.017	0.004	7
		09-10	17.9	3.5	8
	20-39	05-06	.034	0.002	16
		07-08	.047	0.009	13
		09-10	33.5	2.3	19
	40-59	05-06	.123	0.011	13
		07-08	.143	0.009	17
		09-10	133	19	17
60+	05-06	.242	0.02	17	
	07-08	.302	0.022	21	
	09-10	232	18	22	
Non-Hispanic Black Male	12-19	05-06	.024	0.003	13
		07-08	.022	0.003	6
		09-10	20.7	3.8	5
	20-39	05-06	.046	0.007	6
		07-08	.045	0.005	6
		09-10	60.0	13.5	6
	40-59	05-06	.133	0.016	5
		07-08	.183	0.028	6
		09-10	182	24	7
60+	05-06	.335	0.042	5	
	07-08	.416	0.054	8	
	09-10	305	36	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4,4',5' & 2,3,3',4,4',6-Hexachlorobiphenyl (PCB 138 & 158) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.015	0.001	14
		07-08	.016	0.003	5
		09-10	11.9	1.1	5
	20-39	05-06	.040	0.005	7
		07-08	.036	0.005	8
		09-10	32.8	5	7
	40-59	05-06	.165	0.019	7
		07-08	.171	0.02	8
		09-10	177	24	7
60+	05-06	.541	0.16	5	
	07-08	.477	0.035	7	
	09-10	380	58	7	
Mexican American Male	12-19	05-06	.014	0.002	11
		07-08	.014	0.003	6
		09-10	14.6	2	8
	20-39	05-06	.032	0.003	9
		07-08	.039	0.004	9
		09-10	25.4	3.9	8
	40-59	05-06	.079	0.004	4
		07-08	.108	0.015	6
		09-10	76.5	7.7	8
60+	05-06	.142	0.023	4	
	07-08	.174	0.025	5	
	09-10	161	16	5	
Mexican American Female	12-19	05-06	.010	0.001	16
		07-08	.009	0.002	5
		09-10	10.7	1.6	7
	20-39	05-06	.022	0.003	9
		07-08	.026	0.001	8
		09-10	22.2	2.2	10
	40-59	05-06	.091	0.007	6
		07-08	.099	0.014	6
		09-10	80.4	8.4	9
60+	05-06	.162	0.011	3	
	07-08	.177	0.029	5	
	09-10	177	23	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4,4',5' & 2,3,3',4,4',6-Hexachlorobiphenyl (PCB 138 & 158) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	14.8	1.5	11
	20-39	09-10	32.8	4.3	13
	40-59	09-10	93.6	10.6	13
	60+	09-10	189	20	8
All Hispanic Female	12-19	09-10	11.7	1.5	10
	20-39	09-10	24.8	2.4	14
	40-59	09-10	78.9	7.4	14
	60+	09-10	175	14	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4',5,5'-Hexachlorobiphenyl (PCB 146) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	13.3 (<LOD-16.1)	1923
	01-02	*	< LOD	< LOD	11.0 (<LOD-12.5)	15.4 (13.6-16.9)	2299
	03-04	2.17 (2.02-2.32)	2.21 (2.03-2.54)	4.80 (4.38-5.21)	8.27 (7.10-9.50)	11.7 (10.2-13.3)	1894
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	667
	01-02	*	< LOD	< LOD	< LOD	< LOD	758
	03-04	.620 (.562-.685)	.600 (.520-.690)	1.02 (.870-1.20)	1.67 (1.50-1.80)	2.30 (1.79-2.97)	594
20 years and older	99-00	*	< LOD	< LOD	< LOD	14.3 (<LOD-17.1)	1256
	01-02	*	< LOD	< LOD	11.8 (10.7-13.5)	16.5 (14.6-18.1)	1541
	03-04	2.60 (2.41-2.79)	2.60 (2.40-2.90)	5.27 (4.82-5.88)	8.81 (8.00-9.80)	12.7 (10.7-15.2)	1300
Gender Males	99-00	*	< LOD	< LOD	< LOD	13.1 (<LOD-17.1)	915
	01-02	*	< LOD	< LOD	11.0 (<LOD-13.0)	15.4 (13.0-17.2)	1069
	03-04	2.16 (1.97-2.37)	2.10 (1.90-2.50)	4.80 (4.09-5.30)	8.30 (6.90-10.1)	12.4 (10.0-14.9)	945
Females	99-00	*	< LOD	< LOD	< LOD	13.9 (<LOD-16.3)	1008
	01-02	*	< LOD	< LOD	11.0 (<LOD-12.2)	15.2 (13.2-17.3)	1230
	03-04	2.17 (2.02-2.34)	2.35 (2.04-2.63)	4.83 (4.47-5.37)	8.00 (7.04-9.10)	11.3 (9.95-13.2)	949
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	633
	01-02	*	< LOD	< LOD	< LOD	< LOD	567
	03-04	.940 (.826-1.07)	.820 (.780-1.00)	1.74 (1.21-2.60)	3.31 (2.80-4.00)	4.60 (3.47-6.00)	425
Non-Hispanic blacks	99-00	*	< LOD	< LOD	17.0 (13.4-22.9)	29.8 (20.2-42.2)	412
	01-02	*	< LOD	< LOD	16.6 (12.8-21.4)	23.8 (16.9-31.6)	515
	03-04	2.81 (2.37-3.34)	2.60 (2.05-3.50)	7.10 (4.97-8.90)	16.8 (11.5-23.2)	28.5 (17.8-41.6)	463
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	723
	01-02	*	< LOD	< LOD	10.8 (<LOD-12.0)	15.2 (12.8-16.8)	1054
	03-04	2.25 (2.06-2.45)	2.35 (2.10-2.60)	4.82 (4.37-5.41)	7.76 (6.94-8.70)	10.5 (9.51-11.3)	885

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 12.4, 10.5, and 0.4, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4',5,5'-Hexachlorobiphenyl (PCB 146) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	.633	0.079	9
		07-08	*	*	6
		09-10	.760	0.108	9
	20-39	05-06	1.41	0.24	12
		07-08	1.21	0.11	15
		09-10	1.21	0.15	16
	40-59	05-06	3.69	0.22	12
		07-08	3.32	0.21	16
		09-10	3.12	0.37	17
60+	05-06	7.11	0.38	15	
	07-08	7.67	0.73	23	
	09-10	6.47	0.65	19	
Non-Hispanic White Female	12-19	05-06	.514	0.05	10
		07-08	*	*	7
		09-10	.597	0.157	7
	20-39	05-06	.908	0.06	16
		07-08	1.09	0.25	13
		09-10	.938	0.059	18
	40-59	05-06	3.13	0.19	13
		07-08	3.20	0.16	17
		09-10	3.74	0.39	17
60+	05-06	7.04	0.65	17	
	07-08	7.10	0.53	21	
	09-10	7.54	0.71	22	
Non-Hispanic Black Male	12-19	05-06	.890	0.147	13
		07-08	.694	0.182	6
		09-10	.687	0.185	6
	20-39	05-06	1.73	0.33	6
		07-08	1.26	0.15	6
		09-10	2.25	0.63	6
	40-59	05-06	5.46	0.74	5
		07-08	5.79	0.97	6
		09-10	8.20	1.68	7
60+	05-06	14.3	1.5	5	
	07-08	14.7	2	8	
	09-10	14.1	1.4	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4',5,5'-Hexachlorobiphenyl (PCB 146) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.517	0.047	14
		07-08	*	*	5
		09-10	*	*	4
	20-39	05-06	1.36	0.19	7
		07-08	1.17	0.13	8
		09-10	1.23	0.24	7
	40-59	05-06	5.30	0.61	7
		07-08	4.78	0.53	8
		09-10	7.16	1.77	7
	60+	05-06	21.0	5.7	5
07-08		15.5	1.5	7	
09-10		16.6	2.5	7	
Mexican American Male	12-19	05-06	.358	0.042	11
		07-08	*	*	6
		09-10	.569	0.128	7
	20-39	05-06	.828	0.059	9
		07-08	.841	0.079	9
		09-10	.662	0.063	8
	40-59	05-06	1.94	0.1	4
		07-08	3.10	0.43	6
		09-10	2.04	0.18	8
	60+	05-06	4.17	0.84	4
07-08		4.91	0.43	5	
09-10		5.26	0.41	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	.538	0.075	9
		07-08	.610	0.092	8
		09-10	.462	0.07	10
	40-59	05-06	2.21	0.19	6
		07-08	2.49	0.31	6
		09-10	1.65	0.16	9
	60+	05-06	4.29	0.14	3
07-08		4.67	0.82	5	
09-10		4.82	0.6	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4',5,5'-Hexachlorobiphenyl (PCB 146) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	.565	0.092	10
	20-39	09-10	.878	0.109	12
	40-59	09-10	2.73	0.38	13
	60+	09-10	6.22	0.8	8
All Hispanic Female	12-19	09-10	*	*	9
	20-39	09-10	.626	0.1	14
	40-59	09-10	2.02	0.23	13
	60+	09-10	5.18	0.41	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4',5,5'-Hexachlorobiphenyl (PCB 146) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	.080 (<LOD-.110)	1923
	01-02	*	< LOD	< LOD	.070 (<LOD-.080)	.110 (.090-.120)	2299
	03-04	.013 (.012-.014)	.014 (.013-.016)	.032 (.028-.035)	.054 (.047-.062)	.077 (.069-.090)	1894
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	667
	01-02	*	< LOD	< LOD	< LOD	< LOD	758
	03-04	.003 (.003-.003)	.003 (.003-.003)	.006 (.004-.007)	.008 (.007-.010)	.011 (.009-.014)	594
20 years and older	99-00	*	< LOD	< LOD	< LOD	.090 (<LOD-.120)	1256
	01-02	*	< LOD	< LOD	.080 (.070-.090)	.110 (.100-.120)	1541
	03-04	.016 (.015-.018)	.017 (.015-.020)	.035 (.032-.038)	.058 (.053-.064)	.084 (.073-.099)	1300
Gender Males	99-00	*	< LOD	< LOD	< LOD	.080 (<LOD-.110)	915
	01-02	*	< LOD	< LOD	.070 (<LOD-.090)	.100 (.090-.120)	1069
	03-04	.013 (.012-.015)	.014 (.012-.016)	.032 (.027-.036)	.054 (.045-.063)	.074 (.064-.096)	945
Females	99-00	*	< LOD	< LOD	< LOD	.090 (<LOD-.110)	1008
	01-02	*	< LOD	< LOD	.070 (<LOD-.080)	.110 (.090-.120)	1230
	03-04	.013 (.012-.014)	.015 (.013-.016)	.032 (.028-.036)	.054 (.047-.065)	.079 (.069-.088)	949
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	633
	01-02	*	< LOD	< LOD	< LOD	< LOD	567
	03-04	.006 (.005-.007)	.005 (.004-.007)	.012 (.008-.016)	.024 (.017-.033)	.034 (.024-.046)	425
Non-Hispanic blacks	99-00	*	< LOD	< LOD	.110 (.080-.130)	.180 (.120-.270)	412
	01-02	*	< LOD	< LOD	.100 (.080-.130)	.150 (.110-.200)	515
	03-04	.016 (.013-.019)	.016 (.012-.019)	.041 (.030-.061)	.100 (.069-.167)	.180 (.126-.224)	463
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	723
	01-02	*	< LOD	< LOD	.070 (<LOD-.080)	.100 (.090-.120)	1054
	03-04	.014 (.013-.015)	.015 (.013-.018)	.033 (.028-.036)	.053 (.047-.057)	.069 (.064-.075)	885

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4',5,5'-Hexachlorobiphenyl (PCB 146) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	.004	0	9
		07-08	*	*	6
		09-10	4.09	0.62	9
	20-39	05-06	.010	0.002	12
		07-08	.008	0.001	15
		09-10	7.85	0.92	16
	40-59	05-06	.028	0.002	12
		07-08	.024	0.001	16
		09-10	21.3	2.7	17
60+	05-06	.048	0.002	15	
	07-08	.049	0.004	23	
	09-10	39.3	4.1	19	
Non-Hispanic White Female	12-19	05-06	.003	0	10
		07-08	*	*	7
		09-10	2.88	0.79	7
	20-39	05-06	.006	0	16
		07-08	.007	0.002	13
		09-10	4.97	0.32	18
	40-59	05-06	.023	0.002	13
		07-08	.021	0.001	17
		09-10	23.3	2.3	17
60+	05-06	.051	0.004	17	
	07-08	.048	0.003	21	
	09-10	46.0	4.5	22	
Non-Hispanic Black Male	12-19	05-06	.004	0.001	13
		07-08	.003	0.001	6
		09-10	**3.25	0.99	6
	20-39	05-06	.010	0.002	6
		07-08	.007	0.001	6
		09-10	13.0	3.3	6
	40-59	05-06	.035	0.005	5
		07-08	.037	0.006	6
		09-10	49.4	8.9	7
60+	05-06	.086	0.009	5	
	07-08	.090	0.013	8	
	09-10	75.9	8.7	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4',5,5'-Hexachlorobiphenyl (PCB 146) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.003	0	14
		07-08	*	*	5
		09-10	*	*	4
	20-39	05-06	.008	0.001	7
		07-08	.006	0.001	8
		09-10	6.16	1.33	7
	40-59	05-06	.034	0.004	7
		07-08	.029	0.004	8
		09-10	39.6	8.8	7
	60+	05-06	.140	0.038	5
07-08		.093	0.009	7	
09-10		94.9	14.3	7	
Mexican American Male	12-19	05-06	.002	0	11
		07-08	*	*	6
		09-10	2.66	0.61	7
	20-39	05-06	.006	0.001	9
		07-08	.006	0.001	9
		09-10	4.07	0.49	8
	40-59	05-06	.016	0.001	4
		07-08	.022	0.003	6
		09-10	14.1	1.6	8
	60+	05-06	.030	0.006	4
07-08		.035	0.002	5	
09-10		32.3	2.3	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	.004	0.001	9
		07-08	.004	0.001	8
		09-10	2.55	0.42	10
	40-59	05-06	.016	0.001	6
		07-08	.017	0.002	6
		09-10	10.7	1.3	9
	60+	05-06	.033	0.003	3
07-08		.032	0.006	5	
09-10		26.7	3.1	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4',5,5'-Hexachlorobiphenyl (PCB 146) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	2.64	0.45	10
	20-39	09-10	5.80	0.99	12
	40-59	09-10	18.6	2.6	13
	60+	09-10	38.8	4.1	8
All Hispanic Female	12-19	09-10	*	*	9
	20-39	09-10	3.50	0.59	14
	40-59	09-10	12.8	1.6	13
	60+	09-10	30.9	2.6	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4',5',6-Hexachlorobiphenyl (PCB 149) (lipid adjusted) (2001 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	01-02	*	< LOD	< LOD	< LOD	< LOD	2307
	03-04	.598 (.556-.642)	.600 (.550-.680)	.900 (.830-1.00)	1.45 (1.28-1.60)	1.90 (1.68-2.20)	1873
Age group 12-19 years	01-02	*	< LOD	< LOD	< LOD	< LOD	758
	03-04	.650 (.605-.698)	.640 (.600-.700)	1.00 (.900-1.10)	1.70 (1.40-2.15)	2.40 (1.80-2.98)	590
20 years and older	01-02	*	< LOD	< LOD	< LOD	< LOD	1549
	03-04	.590 (.546-.638)	.600 (.540-.680)	.900 (.800-1.00)	1.40 (1.20-1.60)	1.89 (1.60-2.17)	1283
Gender Males	01-02	*	< LOD	< LOD	< LOD	< LOD	1075
	03-04	.623 (.578-.671)	.650 (.600-.700)	.960 (.880-1.06)	1.50 (1.30-1.66)	1.90 (1.60-2.40)	930
Females	01-02	*	< LOD	< LOD	< LOD	< LOD	1232
	03-04	.575 (.521-.634)	.600 (.500-.620)	.890 (.800-.950)	1.40 (1.20-1.67)	1.90 (1.69-2.20)	943
Race/ethnicity Mexican Americans	01-02	*	< LOD	< LOD	< LOD	< LOD	567
	03-04	.549 (.496-.608)	.530 (.500-.600)	.900 (.700-1.04)	1.28 (1.03-1.60)	1.60 (1.26-2.30)	408
Non-Hispanic blacks	01-02	*	< LOD	< LOD	< LOD	< LOD	515
	03-04	.760 (.678-.853)	.800 (.700-.880)	1.20 (1.00-1.58)	1.98 (1.70-2.59)	2.90 (2.20-4.20)	463
Non-Hispanic whites	01-02	*	< LOD	< LOD	< LOD	< LOD	1061
	03-04	.574 (.524-.628)	.600 (.510-.670)	.880 (.800-.950)	1.33 (1.19-1.50)	1.80 (1.50-2.02)	881

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02 and 03-04 are 10.5 and 0.4.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4',5',6-Hexachlorobiphenyl (PCB 149) (lipid adjusted) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Non-Hispanic White Male	12-19	05-06	*	*	9	
		07-08	*	*	6	
	20-39	05-06	*	*	12	
		07-08	*	*	15	
	40-59	05-06	*	*	12	
		07-08	*	*	16	
	60+	05-06	*	*	15	
		07-08	*	*	23	
	Non-Hispanic White Female	12-19	05-06	*	*	10
			07-08	*	*	7
20-39		05-06	*	*	16	
		07-08	*	*	13	
40-59		05-06	*	*	13	
		07-08	*	*	17	
60+		05-06	*	*	17	
		07-08	*	*	21	
Non-Hispanic Black Male		12-19	05-06	*	*	13
			07-08	*	*	6
	20-39	05-06	*	*	6	
		07-08	*	*	6	
	40-59	05-06	*	*	5	
		07-08	*	*	6	
	60+	05-06	*	*	5	
		07-08	*	*	8	
	Non-Hispanic Black Female	12-19	05-06	*	*	14
			07-08	*	*	5
20-39		05-06	*	*	7	
		07-08	*	*	8	
40-59		05-06	*	*	7	
		07-08	*	*	8	
60+		05-06	.373	0.106	5	
		07-08	*	*	7	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06 and 07-08 are 0.31 and 0.3.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4',5',6-Hexachlorobiphenyl (PCB 149) (lipid adjusted) (2005 – 2008)††

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Mexican American Male	12-19	05-06	*	*	11	
		07-08	*	*	6	
	20-39	05-06	*	*	9	
		07-08	*	*	9	
	40-59	05-06	*	*	4	
		07-08	*	*	6	
	60+	05-06	*	*	4	
		07-08	*	*	5	
	Mexican American Female	12-19	05-06	*	*	16
			07-08	*	*	5
20-39		05-06	*	*	9	
		07-08	*	*	8	
40-59		05-06	*	*	6	
		07-08	*	*	6	
60+		05-06	*	*	3	
		07-08	*	*	5	

††Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06 and 07-08 are 0.31 and 0.3.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4',5',6-Hexachlorobiphenyl (PCB 149) (whole weight) (2001 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	01-02	*	< LOD	< LOD	< LOD	< LOD	2307
	03-04	.004 (.003-.004)	.004 (.004-.004)	.006 (.005-.006)	.009 (.008-.009)	.011 (.010-.013)	1873
Age group 12-19 years	01-02	*	< LOD	< LOD	< LOD	< LOD	758
	03-04	.003 (.003-.004)	.003 (.003-.003)	.005 (.004-.006)	.008 (.007-.009)	.012 (.008-.016)	590
20 years and older	01-02	*	< LOD	< LOD	< LOD	< LOD	1549
	03-04	.004 (.003-.004)	.004 (.004-.004)	.006 (.005-.006)	.009 (.007-.010)	.011 (.010-.013)	1283
Gender Males	01-02	*	< LOD	< LOD	< LOD	< LOD	1075
	03-04	.004 (.004-.004)	.004 (.004-.004)	.006 (.005-.007)	.009 (.008-.010)	.011 (.010-.013)	930
Females	01-02	*	< LOD	< LOD	< LOD	< LOD	1232
	03-04	.003 (.003-.004)	.004 (.003-.004)	.005 (.005-.006)	.008 (.007-.010)	.011 (.009-.013)	943
Race/ethnicity Mexican Americans	01-02	*	< LOD	< LOD	< LOD	< LOD	567
	03-04	.003 (.003-.004)	.003 (.003-.004)	.005 (.004-.006)	.007 (.006-.008)	.009 (.007-.014)	408
Non-Hispanic blacks	01-02	*	< LOD	< LOD	< LOD	< LOD	515
	03-04	.004 (.004-.005)	.004 (.004-.005)	.007 (.006-.008)	.012 (.010-.013)	.019 (.013-.022)	463
Non-Hispanic whites	01-02	*	< LOD	< LOD	< LOD	< LOD	1061
	03-04	.004 (.003-.004)	.004 (.003-.004)	.005 (.005-.006)	.008 (.007-.009)	.010 (.009-.012)	881

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4',5',6-Hexachlorobiphenyl (PCB 149) (whole weight) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
	20-39	05-06	*	*	12
		07-08	*	*	15
	40-59	05-06	*	*	12
		07-08	*	*	16
60+	05-06	*	*	15	
	07-08	*	*	23	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
	20-39	05-06	*	*	16
		07-08	*	*	13
	40-59	05-06	*	*	13
		07-08	*	*	17
60+	05-06	*	*	17	
	07-08	*	*	21	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
	20-39	05-06	*	*	6
		07-08	*	*	6
	40-59	05-06	*	*	5
		07-08	*	*	6
60+	05-06	*	*	5	
	07-08	*	*	8	
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
	20-39	05-06	*	*	7
		07-08	*	*	8
	40-59	05-06	*	*	7
		07-08	*	*	8
60+	05-06	** .002	0.001	5	
	07-08	*	*	7	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4',5',6-Hexachlorobiphenyl (PCB 149) (whole weight) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Mexican American Male	12-19	05-06	*	*	11	
		07-08	*	*	6	
	20-39	05-06	*	*	9	
		07-08	*	*	9	
	40-59	05-06	*	*	4	
		07-08	*	*	6	
	60+	05-06	*	*	4	
		07-08	*	*	5	
	Mexican American Female	12-19	05-06	*	*	16
			07-08	*	*	5
20-39		05-06	*	*	9	
		07-08	*	*	8	
40-59		05-06	*	*	6	
		07-08	*	*	6	
60+		05-06	*	*	3	
		07-08	*	*	5	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,5,5',6-Hexachlorobiphenyl (PCB 151) (lipid adjusted) (2001 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	01-02	*	< LOD	< LOD	< LOD	< LOD	2307
	03-04	*	< LOD	.420 (.400-.500)	.700 (.640-.820)	1.00 (.840-1.30)	1870
Age group 12-19 years	01-02	*	< LOD	< LOD	< LOD	< LOD	758
	03-04	*	< LOD	.400 (<LOD-.470)	.700 (.510-.820)	.880 (.700-1.10)	588
20 years and older	01-02	*	< LOD	< LOD	< LOD	< LOD	1549
	03-04	*	< LOD	.440 (.400-.500)	.720 (.650-.850)	1.02 (.850-1.40)	1282
Gender Males	01-02	*	< LOD	< LOD	< LOD	< LOD	1075
	03-04	*	< LOD	.430 (.400-.500)	.720 (.620-.900)	1.10 (.830-1.50)	931
Females	01-02	*	< LOD	< LOD	< LOD	< LOD	1232
	03-04	*	< LOD	.410 (.400-.500)	.700 (.600-.820)	1.00 (.830-1.20)	939
Race/ethnicity Mexican Americans	01-02	*	< LOD	< LOD	< LOD	< LOD	567
	03-04	*	< LOD	< LOD	.500 (.400-.700)	.700 (.530-.700)	426
Non-Hispanic blacks	01-02	*	< LOD	< LOD	< LOD	< LOD	515
	03-04	*	.400 (<LOD-.500)	.700 (.500-.900)	1.30 (.900-1.90)	2.20 (1.40-4.55)	461
Non-Hispanic whites	01-02	*	< LOD	< LOD	< LOD	< LOD	1061
	03-04	*	< LOD	.400 (<LOD-.450)	.650 (.590-.700)	.850 (.750-1.00)	864

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02 and 03-04 are 10.5 and 0.4.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,5,5',6-Hexachlorobiphenyl (PCB 151) (lipid adjusted) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Non-Hispanic White Male	12-19	05-06	*	*	9	
		07-08	*	*	6	
	20-39	05-06	*	*	12	
		07-08	*	*	15	
	40-59	05-06	*	*	12	
		07-08	*	*	16	
	60+	05-06	*	*	15	
		07-08	*	*	23	
	Non-Hispanic White Female	12-19	05-06	*	*	10
			07-08	*	*	7
20-39		05-06	*	*	16	
		07-08	*	*	13	
40-59		05-06	*	*	13	
		07-08	*	*	17	
60+		05-06	*	*	17	
		07-08	*	*	21	
Non-Hispanic Black Male		12-19	05-06	*	*	13
			07-08	*	*	6
	20-39	05-06	*	*	6	
		07-08	*	*	6	
	40-59	05-06	*	*	5	
		07-08	*	*	6	
	60+	05-06	.439	0.048	5	
		07-08	*	*	8	
	Non-Hispanic Black Female	12-19	05-06	*	*	14
			07-08	*	*	5
20-39		05-06	*	*	7	
		07-08	*	*	8	
40-59		05-06	*	*	7	
		07-08	*	*	8	
60+		05-06	.468	0.07	5	
		07-08	.580	0.148	7	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06 and 07-08 are 0.31 and 0.3.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,5,5',6-Hexachlorobiphenyl (PCB 151) (lipid adjusted) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Mexican American Male	12-19	05-06	*	*	11	
		07-08	*	*	6	
	20-39	05-06	*	*	9	
		07-08	*	*	9	
	40-59	05-06	*	*	4	
		07-08	*	*	6	
	60+	05-06	*	*	4	
		07-08	*	*	5	
	Mexican American Female	12-19	05-06	*	*	16
			07-08	*	*	5
20-39		05-06	*	*	9	
		07-08	*	*	8	
40-59		05-06	*	*	6	
		07-08	*	*	6	
60+		05-06	*	*	3	
		07-08	*	*	5	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06 and 07-08 are 0.31 and 0.3.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,5,5',6-Hexachlorobiphenyl (PCB 151) (whole weight) (2001 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	01-02	*	< LOD	< LOD	< LOD	< LOD	2307
	03-04	*	< LOD	.003 (.002-.003)	.004 (.004-.005)	.006 (.005-.008)	1870
Age group 12-19 years	01-02	*	< LOD	< LOD	< LOD	< LOD	758
	03-04	*	< LOD	.002 (<LOD-.002)	.003 (.003-.004)	.004 (.003-.006)	588
20 years and older	01-02	*	< LOD	< LOD	< LOD	< LOD	1549
	03-04	*	< LOD	.003 (.003-.003)	.004 (.004-.006)	.007 (.005-.010)	1282
Gender Males	01-02	*	< LOD	< LOD	< LOD	< LOD	1075
	03-04	*	< LOD	.003 (.003-.003)	.005 (.004-.006)	.006 (.005-.010)	931
Females	01-02	*	< LOD	< LOD	< LOD	< LOD	1232
	03-04	*	< LOD	.003 (.002-.003)	.004 (.004-.005)	.006 (.005-.008)	939
Race/ethnicity Mexican Americans	01-02	*	< LOD	< LOD	< LOD	< LOD	567
	03-04	*	< LOD	< LOD	.003 (.003-.004)	.004 (.003-.005)	426
Non-Hispanic blacks	01-02	*	< LOD	< LOD	< LOD	< LOD	515
	03-04	*	.002 (<LOD-.003)	.004 (.003-.006)	.008 (.006-.010)	.013 (.008-.028)	461
Non-Hispanic whites	01-02	*	< LOD	< LOD	< LOD	< LOD	1061
	03-04	*	< LOD	.003 (<LOD-.003)	.004 (.004-.004)	.005 (.004-.006)	864

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,5,5',6-Hexachlorobiphenyl (PCB 151) (whole weight) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
	20-39	05-06	*	*	12
		07-08	*	*	15
	40-59	05-06	*	*	12
		07-08	*	*	16
60+	05-06	*	*	15	
	07-08	*	*	23	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
	20-39	05-06	*	*	16
		07-08	*	*	13
	40-59	05-06	*	*	13
		07-08	*	*	17
60+	05-06	*	*	17	
	07-08	*	*	21	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
	20-39	05-06	*	*	6
		07-08	*	*	6
	40-59	05-06	*	*	5
		07-08	*	*	6
60+	05-06	.003	0	5	
	07-08	*	*	8	
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
	20-39	05-06	*	*	7
		07-08	*	*	8
	40-59	05-06	*	*	7
		07-08	*	*	8
60+	05-06	.003	0	5	
	07-08	.004	0.001	7	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,5,5',6-Hexachlorobiphenyl (PCB 151) (whole weight) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Mexican American Male	12-19	05-06	*	*	11	
		07-08	*	*	6	
	20-39	05-06	*	*	9	
		07-08	*	*	9	
	40-59	05-06	*	*	4	
		07-08	*	*	6	
	60+	05-06	*	*	4	
		07-08	*	*	5	
	Mexican American Female	12-19	05-06	*	*	16
			07-08	*	*	5
20-39		05-06	*	*	9	
		07-08	*	*	8	
40-59		05-06	*	*	6	
		07-08	*	*	6	
60+		05-06	*	*	3	
		07-08	*	*	5	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',4,4',5,5'-Hexachlorobiphenyl (PCB 153) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	77.8 (70.2-87.3)	114 (93.0-133)	1926
	01-02	27.2 (24.7-30.1)	30.1 (26.1-34.3)	57.8 (52.1-63.2)	94.7 (86.5-104)	126 (109-142)	2306
	03-04	19.8 (18.8-20.9)	20.8 (18.4-22.2)	43.3 (39.1-46.9)	71.8 (64.4-82.8)	97.1 (88.8-111)	1896
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	668
	01-02	*	< LOD	12.5 (11.1-14.1)	21.2 (17.4-26.7)	31.9 (23.1-64.7)	757
	03-04	5.86 (5.25-6.55)	5.40 (4.70-6.21)	8.50 (7.80-9.85)	15.7 (12.9-18.4)	20.7 (16.9-28.3)	596
20 years and older	99-00	*	< LOD	< LOD	83.2 (75.9-91.8)	122 (100-139)	1258
	01-02	32.6 (29.5-36.1)	35.1 (31.1-39.0)	62.8 (57.6-68.0)	99.5 (90.7-110)	132 (116-146)	1549
	03-04	23.7 (22.3-25.1)	24.2 (21.8-27.4)	47.1 (43.3-50.5)	77.5 (68.0-87.9)	101 (92.9-119)	1300
Gender Males	99-00	*	< LOD	< LOD	75.0 (66.7-86.2)	111 (87.7-128)	917
	01-02	28.5 (25.5-32.0)	31.5 (26.7-35.2)	57.7 (48.3-66.2)	97.5 (82.1-110)	126 (104-150)	1074
	03-04	20.0 (18.7-21.3)	19.7 (17.7-21.2)	42.9 (37.4-47.6)	72.7 (60.4-88.8)	107 (86.8-122)	947
Females	99-00	*	< LOD	< LOD	79.0 (70.2-92.0)	119 (91.4-142)	1009
	01-02	26.1 (23.6-28.8)	29.0 (25.1-33.4)	57.9 (52.1-62.9)	94.3 (87.8-98.2)	128 (105-145)	1232
	03-04	19.7 (18.4-21.1)	21.9 (19.0-24.1)	43.8 (39.4-47.7)	70.9 (63.0-81.5)	93.3 (83.8-100)	949
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	67.5 (59.5-71.8)	634
	01-02	12.5 (10.8-14.4)	11.1 (<LOD-13.3)	24.5 (18.2-33.9)	47.4 (36.2-60.3)	66.7 (55.2-72.3)	567
	03-04	8.75 (7.39-10.4)	7.86 (6.17-9.40)	15.6 (11.4-22.2)	30.3 (25.2-34.9)	37.8 (31.1-45.2)	425
Non-Hispanic blacks	99-00	*	< LOD	59.4 (<LOD-82.0)	121 (90.3-159)	176 (130-287)	412
	01-02	30.0 (26.2-34.4)	31.0 (25.8-36.4)	65.1 (54.2-82.7)	127 (97.1-152)	170 (126-246)	515
	03-04	22.8 (19.1-27.2)	20.9 (17.0-28.7)	54.1 (37.3-69.2)	126 (92.9-158)	194 (126-294)	464
Non-Hispanic whites	99-00	*	< LOD	< LOD	76.4 (69.3-83.9)	102 (87.8-127)	725
	01-02	29.9 (26.8-33.4)	33.0 (28.7-37.1)	61.2 (55.8-66.7)	96.3 (86.5-109)	126 (104-142)	1061
	03-04	21.3 (19.7-23.1)	22.2 (20.4-25.9)	44.9 (39.7-49.5)	70.9 (60.4-82.1)	91.3 (82.1-103)	885

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 55.6, 10.5, and 1.1, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',4,4',5,5'-Hexachlorobiphenyl (PCB 153) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	6.27	1.11	9
		07-08	5.80	1.04	6
		09-10	7.32	0.76	10
	20-39	05-06	13.2	2.6	12
		07-08	11.0	1	15
		09-10	11.3	1.1	17
	40-59	05-06	36.4	5.1	12
		07-08	28.2	1.6	16
		09-10	29.4	3.6	17
60+	05-06	60.4	2.7	15	
	07-08	63.9	4.8	23	
	09-10	57.7	4.8	21	
Non-Hispanic White Female	12-19	05-06	4.59	0.49	10
		07-08	4.34	0.99	7
		09-10	4.76	0.99	8
	20-39	05-06	8.47	0.59	16
		07-08	9.36	1.4	13
		09-10	8.59	0.56	19
	40-59	05-06	27.8	1.4	13
		07-08	27.7	1.3	17
		09-10	35.1	4.9	17
	60+	05-06	58.0	5.1	17
		07-08	56.4	3.7	21
		09-10	63.1	5	22
Non-Hispanic Black Male	12-19	05-06	7.42	1	13
		07-08	5.74	0.81	6
		09-10	5.86	0.63	5
	20-39	05-06	13.8	2.1	6
		07-08	10.3	0.9	6
		09-10	15.3	4.1	6
	40-59	05-06	38.8	4.2	5
		07-08	41.0	5.5	6
		09-10	53.2	8.4	7
	60+	05-06	103	13	5
		07-08	94.5	11	8
		09-10	97.9	8.5	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.59, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',4,4',5,5'-Hexachlorobiphenyl (PCB 153) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	4.20	0.29	14
		07-08	3.76	0.52	5
		09-10	3.36	0.27	6
	20-39	05-06	10.8	1.4	7
		07-08	8.99	1.17	8
		09-10	8.93	1.48	7
	40-59	05-06	41.2	4	7
		07-08	35.7	3.2	8
		09-10	48.6	10	7
	60+	05-06	130	33	5
07-08		102	8	7	
09-10		118	17	7	
Mexican American Male	12-19	05-06	3.70	0.45	11
		07-08	3.32	0.69	6
		09-10	4.63	0.7	8
	20-39	05-06	6.93	0.31	9
		07-08	6.85	0.64	9
		09-10	6.00	0.64	8
	40-59	05-06	16.5	0.8	4
		07-08	22.4	2.5	6
		09-10	18.2	1.3	8
	60+	05-06	37.3	6.8	4
07-08		39.5	4.1	5	
09-10		46.6	4.1	5	
Mexican American Female	12-19	05-06	2.83	0.2	16
		07-08	**2.88	1.29	5
		09-10	2.46	0.38	7
	20-39	05-06	4.75	0.67	9
		07-08	5.58	0.41	8
		09-10	4.64	0.37	10
	40-59	05-06	19.1	1.5	6
		07-08	20.9	2.8	6
		09-10	15.1	1.6	9
	60+	05-06	36.2	1.6	3
07-08		40.9	8.5	5	
09-10		41.2	5.3	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.59, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',4,4',5,5'-Hexachlorobiphenyl (PCB 153) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	4.74	0.51	11
	20-39	09-10	7.57	0.83	13
	40-59	09-10	21.7	2.3	13
	60+	09-10	49.8	4.4	8
All Hispanic Female	12-19	09-10	2.93	0.44	10
	20-39	09-10	5.70	0.64	14
	40-59	09-10	17.0	1.8	14
	60+	09-10	42.3	3.4	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.59, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',4,4',5,5'-Hexachlorobiphenyl (PCB 153) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	.530 (.490-.560)	.750 (.610-.840)	1926
	01-02	.167 (.151-.185)	.190 (.170-.210)	.380 (.340-.410)	.620 (.560-.690)	.860 (.760-.950)	2306
	03-04	.121 (.114-.128)	.135 (.120-.144)	.283 (.258-.310)	.477 (.439-.518)	.624 (.575-.733)	1896
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	668
	01-02	*	< LOD	.060 (.050-.070)	.110 (.080-.140)	.150 (.110-.310)	757
	03-04	.030 (.027-.033)	.027 (.025-.031)	.044 (.039-.055)	.076 (.062-.098)	.101 (.079-.129)	596
20 years and older	99-00	*	< LOD	< LOD	.560 (.510-.610)	.790 (.670-.880)	1258
	01-02	.206 (.187-.228)	.220 (.200-.250)	.410 (.380-.450)	.670 (.600-.740)	.900 (.820-1.04)	1549
	03-04	.148 (.139-.158)	.156 (.141-.179)	.313 (.283-.339)	.512 (.452-.563)	.671 (.603-.756)	1300
Gender Males	99-00	*	< LOD	< LOD	.530 (.470-.560)	.690 (.580-.850)	917
	01-02	.177 (.159-.198)	.200 (.170-.220)	.380 (.340-.430)	.610 (.510-.730)	.850 (.700-1.04)	1074
	03-04	.123 (.115-.133)	.127 (.111-.146)	.277 (.253-.310)	.474 (.413-.522)	.608 (.533-.794)	947
Females	99-00	*	< LOD	< LOD	.530 (.480-.590)	.770 (.610-.880)	1009
	01-02	.158 (.142-.175)	.180 (.150-.210)	.380 (.340-.400)	.630 (.570-.710)	.860 (.760-.950)	1232
	03-04	.119 (.110-.128)	.138 (.113-.149)	.291 (.253-.319)	.492 (.439-.541)	.624 (.578-.689)	949
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	.470 (.380-.540)	634
	01-02	.075 (.063-.089)	.060 (<LOD-.080)	.150 (.120-.210)	.330 (.270-.420)	.470 (.380-.550)	567
	03-04	.053 (.044-.064)	.047 (.038-.057)	.100 (.078-.144)	.205 (.164-.241)	.323 (.213-.435)	425
Non-Hispanic blacks	99-00	*	< LOD	.370 (<LOD-.510)	.750 (.620-.890)	1.27 (.820-1.64)	412
	01-02	.169 (.146-.195)	.180 (.140-.200)	.390 (.330-.490)	.780 (.580-.950)	1.05 (.830-1.43)	515
	03-04	.129 (.108-.156)	.126 (.098-.149)	.330 (.236-.425)	.734 (.562-1.06)	1.26 (.892-1.60)	464
Non-Hispanic whites	99-00	*	< LOD	< LOD	.520 (.480-.560)	.740 (.580-.850)	725
	01-02	.185 (.165-.207)	.210 (.180-.230)	.390 (.370-.430)	.640 (.570-.720)	.840 (.740-.990)	1061
	03-04	.131 (.121-.143)	.144 (.127-.170)	.295 (.268-.329)	.474 (.412-.518)	.600 (.519-.689)	885

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NL-PCBs_BiomonitoringSummary.html

Serum 2,2',4,4',5,5'-Hexachlorobiphenyl (PCB 153) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	.034	0.006	9
		07-08	.028	0.005	6
		09-10	38.9	3.9	10
	20-39	05-06	.099	0.023	12
		07-08	.074	0.008	15
		09-10	73.3	7.2	17
	40-59	05-06	.279	0.045	12
		07-08	.205	0.011	16
		09-10	201	26	17
60+	05-06	.409	0.015	15	
	07-08	.407	0.028	23	
	09-10	349	30	21	
Non-Hispanic White Female	12-19	05-06	.025	0.003	10
		07-08	.021	0.005	7
		09-10	23.0	5	8
	20-39	05-06	.055	0.004	16
		07-08	.057	0.009	13
		09-10	45.6	3	19
	40-59	05-06	.207	0.016	13
		07-08	.184	0.01	17
		09-10	219	29	17
	60+	05-06	.420	0.033	17
		07-08	.378	0.024	21
		09-10	385	32	22
Non-Hispanic Black Male	12-19	05-06	.037	0.005	13
		07-08	.027	0.003	6
		09-10	26.3	3.5	5
	20-39	05-06	.082	0.013	6
		07-08	.058	0.006	6
		09-10	87.4	20.8	6
	40-59	05-06	.247	0.027	5
		07-08	.263	0.037	6
		09-10	323	44	7
	60+	05-06	.614	0.073	5
		07-08	.576	0.073	8
		09-10	527	52	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',4,4',5,5'-Hexachlorobiphenyl (PCB 153) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.021	0.002	14
		07-08	.018	0.003	5
		09-10	14.8	1.3	6
	20-39	05-06	.062	0.009	7
		07-08	.045	0.006	8
		09-10	44.8	8.1	7
	40-59	05-06	.264	0.029	7
		07-08	.216	0.023	8
		09-10	270	50	7
	60+	05-06	.865	0.218	5
07-08		.614	0.045	7	
09-10		675	100	7	
Mexican American Male	12-19	05-06	.020	0.002	11
		07-08	.018	0.004	6
		09-10	21.9	3.4	8
	20-39	05-06	.049	0.003	9
		07-08	.047	0.005	9
		09-10	37.0	5	8
	40-59	05-06	.134	0.01	4
		07-08	.160	0.02	6
		09-10	126	12	8
	60+	05-06	.268	0.045	4
07-08		.281	0.022	5	
09-10		286	23	5	
Mexican American Female	12-19	05-06	.015	0.001	16
		07-08	** .014	0.006	5
		09-10	11.4	1.6	7
	20-39	05-06	.032	0.005	9
		07-08	.033	0.003	8
		09-10	25.7	2.6	10
	40-59	05-06	.140	0.01	6
		07-08	.141	0.018	6
		09-10	99.0	13.1	9
	60+	05-06	.274	0.023	3
07-08		.283	0.061	5	
09-10		227	26	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',4,4',5,5'-Hexachlorobiphenyl (PCB 153) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	22.2	2.5	11
	20-39	09-10	49.9	8.2	13
	40-59	09-10	148	16	13
	60+	09-10	311	21	8
All Hispanic Female	12-19	09-10	13.5	2	10
	20-39	09-10	31.9	3.9	14
	40-59	09-10	107	12	14
	60+	09-10	251	20	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5-Heptachlorobiphenyl (PCB 170) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	23.6 (22.0-25.4)	30.9 (28.1-35.1)	1798
	01-02	*	< LOD	17.5 (15.7-19.3)	26.7 (24.9-29.0)	35.0 (32.4-37.3)	2301
	03-04	5.46 (5.22-5.71)	6.30 (5.96-7.10)	12.9 (12.3-13.9)	21.7 (19.2-23.5)	28.2 (25.8-29.8)	1888
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	645
	01-02	*	< LOD	< LOD	< LOD	< LOD	756
	03-04	1.12 (.974-1.30)	1.12 (1.00-1.30)	1.90 (1.70-2.50)	4.00 (3.53-4.37)	5.60 (4.35-6.69)	592
20 years and older	99-00	*	< LOD	< LOD	24.9 (23.3-26.4)	33.9 (29.6-37.5)	1153
	01-02	10.5 (<LOD-11.3)	11.1 (<LOD-12.2)	19.1 (17.3-20.9)	28.4 (26.2-30.9)	36.8 (33.4-39.4)	1545
	03-04	6.86 (6.48-7.26)	7.83 (6.87-8.70)	14.2 (13.1-14.9)	22.7 (20.7-24.9)	29.5 (26.7-32.2)	1296
Gender Males	99-00	*	< LOD	< LOD	24.1 (22.0-27.0)	32.6 (28.1-37.0)	863
	01-02	*	10.9 (<LOD-11.9)	18.4 (16.3-20.9)	28.1 (24.7-31.9)	36.1 (32.1-38.3)	1073
	03-04	5.81 (5.43-6.22)	6.40 (5.61-7.68)	13.8 (12.4-14.4)	23.4 (20.4-25.6)	29.4 (26.0-32.7)	942
Females	99-00	*	< LOD	< LOD	22.4 (20.7-25.4)	29.7 (25.8-36.3)	935
	01-02	*	< LOD	16.4 (15.0-18.0)	25.9 (24.0-28.4)	34.0 (30.6-38.4)	1228
	03-04	5.14 (4.82-5.48)	6.28 (5.81-7.18)	12.5 (11.5-13.8)	19.2 (17.9-21.7)	26.1 (24.0-29.8)	946
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	23.2 (20.3-26.5)	606
	01-02	*	< LOD	< LOD	15.4 (11.4-18.7)	21.1 (17.1-25.1)	565
	03-04	2.34 (1.91-2.86)	2.20 (1.54-3.20)	4.91 (3.40-8.17)	10.4 (8.40-13.5)	13.9 (10.8-20.1)	423
Non-Hispanic blacks	99-00	*	< LOD	< LOD	30.9 (23.1-36.3)	41.9 (33.7-59.1)	382
	01-02	*	< LOD	19.0 (14.9-23.2)	32.5 (25.5-43.9)	44.4 (32.5-61.7)	514
	03-04	5.42 (4.63-6.35)	6.28 (5.11-7.75)	14.3 (10.7-18.3)	31.7 (23.1-40.7)	48.5 (32.1-66.1)	461
Non-Hispanic whites	99-00	*	< LOD	< LOD	24.1 (22.1-25.9)	31.0 (26.8-37.3)	658
	01-02	*	10.9 (<LOD-12.0)	18.4 (16.8-20.4)	27.7 (25.4-30.2)	35.0 (32.3-38.1)	1059
	03-04	6.13 (5.74-6.56)	7.40 (6.40-8.18)	13.8 (12.6-14.6)	21.7 (19.2-24.2)	27.0 (24.9-29.5)	882

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 17.2, 10.5, and 0.4, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5-Heptachlorobiphenyl (PCB 170) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	1.41	0.32	9
		07-08	1.52	0.29	6
		09-10	1.54	0.18	10
	20-39	05-06	3.93	0.94	12
		07-08	3.36	0.28	15
		09-10	2.80	0.31	17
	40-59	05-06	13.7	2.6	12
		07-08	10.3	0.4	16
		09-10	9.16	1.17	17
60+	05-06	20.5	1.3	15	
	07-08	22.4	1.4	23	
	09-10	18.0	1.2	21	
Non-Hispanic White Female	12-19	05-06	.896	0.155	10
		07-08	1.14	0.32	7
		09-10	1.00	0.23	8
	20-39	05-06	2.28	0.35	16
		07-08	2.75	0.41	13
		09-10	2.02	0.13	19
	40-59	05-06	8.44	0.46	13
		07-08	9.09	0.45	17
		09-10	9.44	0.96	17
60+	05-06	17.2	1.4	17	
	07-08	18.1	0.9	21	
	09-10	17.1	1.2	22	
Non-Hispanic Black Male	12-19	05-06	1.44	0.28	13
		07-08	1.12	0.28	6
		09-10	1.07	0.1	5
	20-39	05-06	3.71	0.52	6
		07-08	2.82	0.3	6
		09-10	3.03	0.5	6
	40-59	05-06	11.4	1	5
		07-08	13.1	1.5	6
		09-10	12.7	1.1	7
60+	05-06	30.9	3.4	5	
	07-08	30.6	3.4	8	
	09-10	26.5	2.2	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5-Heptachlorobiphenyl (PCB 170) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.589	0.099	14
		07-08	.828	0.105	5
		09-10	.539	0.081	6
	20-39	05-06	2.15	0.52	7
		07-08	2.29	0.35	8
		09-10	2.08	0.43	6
	40-59	05-06	11.1	1.2	7
		07-08	10.8	1	8
		09-10	10.5	1.8	7
	60+	05-06	33.3	6.7	5
07-08		29.0	1.7	7	
09-10		29.0	3.1	7	
Mexican American Male	12-19	05-06	.575	0.138	11
		07-08	.891	0.17	6
		09-10	1.07	0.18	8
	20-39	05-06	2.01	0.11	9
		07-08	2.19	0.24	9
		09-10	1.48	0.17	8
	40-59	05-06	6.41	0.43	4
		07-08	8.71	0.91	6
		09-10	5.80	0.37	8
	60+	05-06	14.0	3.2	4
07-08		16.1	1.9	5	
09-10		15.7	1.2	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	.559	0.071	7
	20-39	05-06	1.39	0.21	9
		07-08	1.62	0.11	8
		09-10	1.33	0.2	9
	40-59	05-06	5.93	0.46	6
		07-08	7.50	1.08	6
		09-10	4.21	0.55	9
	60+	05-06	11.7	0.1	3
07-08		13.5	2.5	5	
09-10		12.5	1.7	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5-Heptachlorobiphenyl (PCB 170) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	1.05	0.13	11
	20-39	09-10	1.88	0.23	13
	40-59	09-10	6.69	0.68	13
	60+	09-10	15.9	1	8
All Hispanic Female	12-19	09-10	.622	0.088	10
	20-39	09-10	1.57	0.2	13
	40-59	09-10	4.77	0.57	14
	60+	09-10	12.2	1.1	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5-Heptachlorobiphenyl (PCB 170) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	.160 (.140-.180)	.210 (.200-.230)	1798
	01-02	*	< LOD	.110 (.110-.120)	.180 (.170-.200)	.250 (.210-.270)	2301
	03-04	.033 (.032-.035)	.041 (.037-.045)	.087 (.080-.092)	.144 (.134-.149)	.188 (.173-.202)	1888
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	645
	01-02	*	< LOD	< LOD	< LOD	< LOD	756
	03-04	.006 (.005-.006)	.006 (.005-.007)	.010 (.009-.012)	.020 (.017-.022)	.029 (.022-.033)	592
20 years and older	99-00	*	< LOD	< LOD	.170 (.150-.190)	.220 (.200-.250)	1153
	01-02	.067 (<LOD-.072)	.070 (<LOD-.080)	.120 (.110-.130)	.200 (.180-.210)	.250 (.230-.290)	1545
	03-04	.043 (.040-.046)	.051 (.045-.054)	.093 (.089-.099)	.149 (.141-.160)	.199 (.180-.223)	1296
Gender Males	99-00	*	< LOD	< LOD	.170 (.140-.200)	.220 (.200-.250)	863
	01-02	*	.070 (<LOD-.080)	.120 (.110-.130)	.190 (.170-.210)	.250 (.210-.280)	1073
	03-04	.036 (.033-.039)	.043 (.036-.051)	.089 (.080-.093)	.148 (.132-.164)	.200 (.173-.225)	942
Females	99-00	*	< LOD	< LOD	.150 (.130-.170)	.210 (.190-.230)	935
	01-02	*	< LOD	.110 (.100-.120)	.180 (.160-.200)	.250 (.210-.280)	1228
	03-04	.031 (.029-.033)	.040 (.034-.044)	.083 (.075-.092)	.140 (.121-.149)	.176 (.160-.194)	946
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	.170 (.130-.190)	606
	01-02	*	< LOD	< LOD	.110 (.080-.130)	.150 (.120-.190)	565
	03-04	.014 (.012-.018)	.015 (.010-.018)	.032 (.025-.047)	.073 (.054-.113)	.119 (.078-.134)	423
Non-Hispanic blacks	99-00	*	< LOD	< LOD	.190 (.150-.210)	.260 (.190-.370)	382
	01-02	*	< LOD	.110 (.090-.140)	.210 (.150-.270)	.290 (.210-.390)	514
	03-04	.031 (.026-.037)	.038 (.027-.044)	.087 (.069-.117)	.210 (.136-.280)	.338 (.221-.380)	461
Non-Hispanic whites	99-00	*	< LOD	< LOD	.160 (.140-.200)	.210 (.200-.240)	658
	01-02	*	.070 (<LOD-.080)	.120 (.110-.130)	.190 (.170-.210)	.250 (.210-.280)	1059
	03-04	.038 (.035-.041)	.046 (.042-.052)	.091 (.083-.096)	.145 (.132-.151)	.180 (.164-.207)	882

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5-Heptachlorobiphenyl (PCB 170) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	.008	0.002	9
		07-08	.007	0.001	6
		09-10	8.16	0.91	10
	20-39	05-06	.030	0.008	12
		07-08	.022	0.002	15
		09-10	18.3	2	17
	40-59	05-06	.105	0.022	12
		07-08	.075	0.003	16
		09-10	62.5	8.3	17
60+	05-06	.139	0.008	15	
	07-08	.143	0.008	23	
	09-10	109	7	21	
Non-Hispanic White Female	12-19	05-06	.005	0.001	10
		07-08	.006	0.002	7
		09-10	4.88	1.15	8
	20-39	05-06	.015	0.002	16
		07-08	.017	0.003	13
		09-10	10.8	0.7	19
	40-59	05-06	.063	0.005	13
		07-08	.060	0.003	17
		09-10	59.2	5.9	17
	60+	05-06	.125	0.009	17
		07-08	.122	0.006	21
		09-10	105	7	22
Non-Hispanic Black Male	12-19	05-06	.007	0.001	13
		07-08	.005	0.001	6
		09-10	4.87	0.65	5
	20-39	05-06	.022	0.003	6
		07-08	.016	0.002	6
		09-10	17.4	3	6
	40-59	05-06	.072	0.007	5
		07-08	.084	0.009	6
		09-10	78.7	7.9	7
	60+	05-06	.185	0.021	5
		07-08	.186	0.022	8
		09-10	142	12	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5-Heptachlorobiphenyl (PCB 170) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.003	0	14
		07-08	.004	0.001	5
		09-10	2.40	0.4	6
	20-39	05-06	.012	0.003	7
		07-08	.011	0.002	8
		09-10	10.4	2.4	6
	40-59	05-06	.071	0.008	7
		07-08	.066	0.007	8
		09-10	58.7	8.8	7
	60+	05-06	.222	0.044	5
07-08		.175	0.011	7	
09-10		166	18	7	
Mexican American Male	12-19	05-06	.003	0.001	11
		07-08	.005	0.001	6
		09-10	5.02	0.85	8
	20-39	05-06	.014	0.001	9
		07-08	.015	0.002	9
		09-10	9.19	1.3	8
	40-59	05-06	.052	0.005	4
		07-08	.062	0.007	6
		09-10	40.1	3.7	8
	60+	05-06	.100	0.021	4
07-08		.115	0.01	5	
09-10		96.7	7.1	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	2.61	0.31	7
	20-39	05-06	.009	0.001	9
		07-08	.010	0.001	8
		09-10	7.49	1.31	9
	40-59	05-06	.043	0.003	6
		07-08	.050	0.007	6
		09-10	27.5	4.2	9
	60+	05-06	.089	0.009	3
07-08		.094	0.018	5	
09-10		68.9	8.8	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5-Heptachlorobiphenyl (PCB 170) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	4.88	0.63	11
	20-39	09-10	12.6	2.4	13
	40-59	09-10	45.6	4.8	13
	60+	09-10	99.7	4.8	8
All Hispanic Female	12-19	09-10	2.89	0.41	10
	20-39	09-10	8.86	1.25	13
	40-59	09-10	30.1	3.8	14
	60+	09-10	71.8	5.8	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,5,5'-Heptachlorobiphenyl (PCB 172) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1901
	01-02	*	< LOD	< LOD	< LOD	< LOD	2199
	03-04	.647 (.606-.691)	.900 (.800-1.00)	1.80 (1.69-1.90)	2.98 (2.70-3.30)	4.16 (3.65-4.55)	1878
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	660
	01-02	*	< LOD	< LOD	< LOD	< LOD	679
	03-04	*	< LOD	< LOD	.610 (.460-.840)	1.10 (.700-1.43)	585
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1241
	01-02	*	< LOD	< LOD	< LOD	< LOD	1520
	03-04	.805 (.746-.869)	1.08 (1.00-1.16)	1.95 (1.80-2.10)	3.20 (2.87-3.60)	4.38 (3.79-5.00)	1293
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	911
	01-02	*	< LOD	< LOD	< LOD	< LOD	1027
	03-04	.668 (.612-.730)	.900 (.800-1.01)	1.82 (1.70-2.00)	3.30 (2.80-3.80)	4.43 (3.76-5.50)	937
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	990
	01-02	*	< LOD	< LOD	< LOD	< LOD	1172
	03-04	.627 (.581-.678)	.900 (.800-1.03)	1.72 (1.51-1.90)	2.80 (2.50-3.11)	3.70 (3.37-4.26)	941
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	630
	01-02	*	< LOD	< LOD	< LOD	< LOD	519
	03-04	*	< LOD	.700 (.470-1.20)	1.40 (1.20-1.95)	2.00 (1.40-2.91)	423
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	409
	01-02	*	< LOD	< LOD	< LOD	< LOD	494
	03-04	.688 (.579-.818)	.900 (.700-1.10)	2.20 (1.70-2.60)	5.00 (3.38-6.53)	7.60 (5.00-11.3)	458
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	706
	01-02	*	< LOD	< LOD	< LOD	< LOD	1027
	03-04	.720 (.665-.781)	1.00 (.870-1.10)	1.80 (1.69-2.00)	2.94 (2.70-3.20)	3.90 (3.53-4.20)	877

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 12.5, 10.5, and 0.4, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,5,5'-Heptachlorobiphenyl (PCB 172) (lipid adjusted) (2005 – 2008)††

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
	20-39	05-06	.480	0.126	12
		07-08	*	*	15
	40-59	05-06	1.57	0.18	12
		07-08	1.29	0.07	16
60+	05-06	2.61	0.16	15	
	07-08	2.98	0.2	23	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
	20-39	05-06	*	*	16
		07-08	*	*	13
	40-59	05-06	1.03	0.06	13
		07-08	1.13	0.06	17
60+	05-06	2.19	0.17	17	
	07-08	2.31	0.13	21	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
	20-39	05-06	.404	0.074	6
		07-08	*	*	6
	40-59	05-06	1.57	0.11	5
		07-08	1.85	0.24	6
60+	05-06	4.16	0.33	5	
	07-08	4.64	0.61	8	

††Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06 and 07-08 are 0.31 and 0.3.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,5,5'-Heptachlorobiphenyl (PCB 172) (lipid adjusted) (2005 – 2008)††

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
	20-39	05-06	*	*	7
		07-08	*	*	8
	40-59	05-06	1.48	0.16	7
		07-08	1.48	0.15	8
60+	05-06	4.61	0.95	5	
	07-08	4.09	0.3	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
	20-39	05-06	*	*	9
		07-08	*	*	9
	40-59	05-06	.808	0.073	4
		07-08	1.32	0.18	6
60+	05-06	1.86	0.45	4	
	07-08	2.34	0.29	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
	20-39	05-06	*	*	9
		07-08	*	*	8
	40-59	05-06	.789	0.059	6
		07-08	.967	0.118	6
60+	05-06	1.50	0.09	3	
	07-08	1.90	0.37	5	

††Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06 and 07-08 are 0.31 and 0.3.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,5,5'-Heptachlorobiphenyl (PCB 172) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1901
	01-02	*	< LOD	< LOD	< LOD	< LOD	2199
	03-04	.004 (.004-.004)	.006 (.005-.006)	.012 (.011-.012)	.021 (.019-.022)	.027 (.024-.031)	1878
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	660
	01-02	*	< LOD	< LOD	< LOD	< LOD	679
	03-04	*	< LOD	< LOD	.003 (.002-.004)	.005 (.004-.009)	585
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1241
	01-02	*	< LOD	< LOD	< LOD	< LOD	1520
	03-04	.005 (.005-.005)	.007 (.006-.007)	.013 (.012-.014)	.022 (.020-.024)	.028 (.025-.033)	1293
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	911
	01-02	*	< LOD	< LOD	< LOD	< LOD	1027
	03-04	.004 (.004-.005)	.006 (.005-.007)	.012 (.011-.013)	.021 (.018-.024)	.029 (.024-.036)	937
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	990
	01-02	*	< LOD	< LOD	< LOD	< LOD	1172
	03-04	.004 (.003-.004)	.006 (.005-.006)	.012 (.010-.012)	.019 (.017-.021)	.026 (.023-.028)	941
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	630
	01-02	*	< LOD	< LOD	< LOD	< LOD	519
	03-04	*	< LOD	.005 (.003-.007)	.010 (.007-.015)	.017 (.011-.022)	423
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	409
	01-02	*	< LOD	< LOD	< LOD	< LOD	494
	03-04	.004 (.003-.005)	.006 (.004-.006)	.013 (.010-.017)	.030 (.020-.048)	.052 (.028-.067)	458
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	706
	01-02	*	< LOD	< LOD	< LOD	< LOD	1027
	03-04	.004 (.004-.005)	.006 (.005-.007)	.012 (.011-.013)	.020 (.018-.022)	.026 (.023-.029)	877

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,5,5'-Heptachlorobiphenyl (PCB 172) (whole weight) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
	20-39	05-06	.004	0.001	12
		07-08	*	*	15
	40-59	05-06	.012	0.002	12
		07-08	.009	0.001	16
60+	05-06	.018	0.001	15	
	07-08	.019	0.001	23	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
	20-39	05-06	*	*	16
		07-08	*	*	13
	40-59	05-06	.008	0.001	13
		07-08	.007	0	17
60+	05-06	.016	0.001	17	
	07-08	.015	0.001	21	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
	20-39	05-06	.002	0	6
		07-08	*	*	6
	40-59	05-06	.010	0.001	5
		07-08	.012	0.002	6
60+	05-06	.025	0.002	5	
	07-08	.028	0.004	8	
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
	20-39	05-06	*	*	7
		07-08	*	*	8
	40-59	05-06	.009	0.001	7
		07-08	.009	0.001	8
60+	05-06	.031	0.006	5	
	07-08	.025	0.002	7	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,5,5'-Heptachlorobiphenyl (PCB 172) (whole weight) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Mexican American Male	12-19	05-06	*	*	11	
		07-08	*	*	6	
	20-39	05-06	*	*	9	
		07-08	*	*	9	
	40-59	05-06	.007	0.001	4	
		07-08	.009	0.001	6	
	60+	05-06	.013	0.003	4	
		07-08	.017	0.002	5	
	Mexican American Female	12-19	05-06	*	*	16
			07-08	*	*	5
20-39		05-06	*	*	9	
		07-08	*	*	8	
40-59		05-06	.006	0	6	
		07-08	.007	0.001	6	
60+		05-06	.011	0.002	3	
		07-08	.013	0.003	5	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,5',6'-Heptachlorobiphenyl (PCB 177) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1873
	01-02	*	< LOD	< LOD	< LOD	< LOD	2287
	03-04	1.13 (1.07-1.20)	1.30 (1.20-1.40)	2.77 (2.50-3.09)	5.30 (4.70-5.90)	7.20 (6.38-8.50)	1882
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	653
	01-02	*	< LOD	< LOD	< LOD	< LOD	756
	03-04	*	< LOD	.600 (.500-.720)	1.04 (.800-1.40)	1.70 (1.20-1.95)	588
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1220
	01-02	*	< LOD	< LOD	< LOD	< LOD	1531
	03-04	1.40 (1.30-1.50)	1.50 (1.40-1.71)	3.10 (2.80-3.44)	5.70 (4.99-6.22)	7.80 (6.50-9.50)	1294
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	887
	01-02	*	< LOD	< LOD	< LOD	< LOD	1065
	03-04	1.12 (1.03-1.21)	1.30 (1.17-1.41)	2.70 (2.40-3.00)	5.30 (4.72-5.80)	7.82 (6.22-9.50)	940
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	986
	01-02	*	< LOD	< LOD	< LOD	< LOD	1222
	03-04	1.15 (1.06-1.23)	1.30 (1.18-1.49)	2.80 (2.57-3.19)	5.30 (4.50-6.06)	6.97 (6.15-7.92)	942
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	622
	01-02	*	< LOD	< LOD	< LOD	< LOD	562
	03-04	.500 (<LOD-.649)	.550 (.400-.700)	1.36 (1.00-1.63)	2.40 (1.86-3.30)	3.40 (2.33-4.63)	423
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	399
	01-02	*	< LOD	< LOD	< LOD	10.6 (<LOD-12.4)	515
	03-04	1.52 (1.25-1.84)	1.56 (1.29-2.05)	4.40 (3.20-5.70)	9.80 (6.30-13.3)	15.8 (10.0-25.7)	458
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	698
	01-02	*	< LOD	< LOD	< LOD	< LOD	1048
	03-04	1.16 (1.08-1.25)	1.34 (1.20-1.50)	2.74 (2.41-3.09)	5.00 (4.57-5.56)	6.50 (5.98-7.40)	880

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 12.5, 10.5, and 0.4, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,5',6'-Heptachlorobiphenyl (PCB 177) (lipid adjusted) (2005 – 2008)††

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Non-Hispanic White Male	12-19	05-06	*	*	9	
		07-08	*	*	6	
	20-39	05-06	.606	0.123	12	
		07-08	.469	0.065	15	
	40-59	05-06	1.59	0.2	12	
		07-08	1.26	0.07	16	
	60+	05-06	2.92	0.19	15	
		07-08	3.26	0.37	23	
	Non-Hispanic White Female	12-19	05-06	*	*	10
			07-08	*	*	7
20-39		05-06	.369	0.022	16	
		07-08	*	*	13	
40-59		05-06	1.24	0.1	13	
		07-08	1.16	0.08	17	
60+		05-06	2.65	0.21	17	
		07-08	2.81	0.2	21	
Non-Hispanic Black Male		12-19	05-06	*	*	13
			07-08	*	*	6
	20-39	05-06	.684	0.098	6	
		07-08	.553	0.065	6	
	40-59	05-06	2.09	0.29	5	
		07-08	2.36	0.33	6	
	60+	05-06	5.62	0.59	5	
		07-08	5.17	0.63	8	
	Non-Hispanic Black Female	12-19	05-06	*	*	14
			07-08	*	*	5
20-39		05-06	.556	0.07	7	
		07-08	*	*	8	
40-59		05-06	2.36	0.22	7	
		07-08	2.18	0.31	8	
60+		05-06	7.31	1.57	5	
		07-08	6.47	0.57	7	

††Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06 and 07-08 are 0.31 and 0.3.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,5',6'-Heptachlorobiphenyl (PCB 177) (lipid adjusted) (2005 – 2008)††

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Mexican American Male	12-19	05-06	*	*	11	
		07-08	*	*	6	
	20-39	05-06	.420	0.032	9	
		07-08	.360	0.068	9	
	40-59	05-06	1.02	0.13	4	
		07-08	1.48	0.22	6	
	60+	05-06	2.10	0.4	4	
		07-08	2.34	0.27	5	
	Mexican American Female	12-19	05-06	*	*	16
			07-08	*	*	5
20-39		05-06	*	*	9	
		07-08	*	*	8	
40-59		05-06	1.20	0.08	6	
		07-08	1.23	0.15	6	
60+		05-06	2.48	0.21	3	
		07-08	2.64	0.53	5	

††Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06 and 07-08 are 0.31 and 0.3.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,5',6'-Heptachlorobiphenyl (PCB 177) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1873
	01-02	*	< LOD	< LOD	< LOD	< LOD	2287
	03-04	.007 (.007-.007)	.008 (.008-.009)	.018 (.016-.021)	.034 (.031-.037)	.047 (.043-.056)	1882
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	653
	01-02	*	< LOD	< LOD	< LOD	< LOD	756
	03-04	*	< LOD	.003 (.003-.004)	.006 (.005-.007)	.007 (.006-.011)	588
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1220
	01-02	*	< LOD	< LOD	< LOD	< LOD	1531
	03-04	.009 (.008-.009)	.010 (.009-.011)	.021 (.018-.023)	.036 (.033-.041)	.053 (.045-.058)	1294
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	887
	01-02	*	< LOD	< LOD	< LOD	< LOD	1065
	03-04	.007 (.006-.007)	.009 (.008-.009)	.018 (.016-.021)	.032 (.030-.036)	.045 (.039-.062)	940
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	986
	01-02	*	< LOD	< LOD	< LOD	< LOD	1222
	03-04	.007 (.006-.008)	.008 (.007-.009)	.018 (.017-.021)	.035 (.032-.042)	.051 (.043-.056)	942
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	622
	01-02	*	< LOD	< LOD	< LOD	< LOD	562
	03-04	.003 (<LOD-.004)	.003 (.002-.005)	.008 (.006-.011)	.018 (.012-.025)	.025 (.018-.032)	423
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	399
	01-02	*	< LOD	< LOD	< LOD	< LOD	515
	03-04	.009 (.007-.011)	.009 (.007-.012)	.026 (.018-.036)	.057 (.044-.090)	.105 (.058-.143)	458
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	698
	01-02	*	< LOD	< LOD	< LOD	< LOD	1048
	03-04	.007 (.007-.008)	.009 (.008-.010)	.018 (.016-.021)	.032 (.029-.036)	.044 (.040-.052)	880

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,5',6'-Heptachlorobiphenyl (PCB 177) (whole weight) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
	20-39	05-06	.005	0.001	12
		07-08	.003	0	15
	40-59	05-06	.012	0.002	12
		07-08	.009	0.001	16
60+	05-06	.020	0.001	15	
	07-08	.021	0.002	23	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
	20-39	05-06	.002	0	16
		07-08	*	*	13
	40-59	05-06	.009	0.001	13
		07-08	.008	0.001	17
60+	05-06	.019	0.001	17	
	07-08	.019	0.001	21	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
	20-39	05-06	.004	0.001	6
		07-08	.003	0	6
	40-59	05-06	.013	0.002	5
		07-08	.015	0.002	6
60+	05-06	.033	0.003	5	
	07-08	.032	0.004	8	
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
	20-39	05-06	.003	0	7
		07-08	*	*	8
	40-59	05-06	.015	0.001	7
		07-08	.013	0.002	8
60+	05-06	.049	0.011	5	
	07-08	.039	0.004	7	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,5',6'-Heptachlorobiphenyl (PCB 177) (whole weight) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Mexican American Male	12-19	05-06	*	*	11	
		07-08	*	*	6	
	20-39	05-06	.003	0	9	
		07-08	.002	0	9	
	40-59	05-06	.008	0.001	4	
		07-08	.010	0.002	6	
	60+	05-06	.015	0.003	4	
		07-08	.016	0.002	5	
	Mexican American Female	12-19	05-06	*	*	16
			07-08	*	*	5
20-39		05-06	*	*	9	
		07-08	*	*	8	
40-59		05-06	.009	0	6	
		07-08	.008	0.001	6	
60+		05-06	.019	0.003	3	
		07-08	.018	0.004	5	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',5,5',6-Heptachlorobiphenyl (PCB 178) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1932
	01-02	*	< LOD	< LOD	< LOD	< LOD	2299
	03-04	.933 (.894-.974)	1.20 (1.10-1.30)	2.50 (2.30-2.67)	4.24 (3.90-4.47)	6.10 (5.13-7.10)	1887
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	669
	01-02	*	< LOD	< LOD	< LOD	< LOD	758
	03-04	*	< LOD	.400 (<LOD-.480)	.850 (.620-1.04)	1.12 (1.00-1.32)	590
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1263
	01-02	*	< LOD	< LOD	< LOD	< LOD	1541
	03-04	1.18 (1.11-1.25)	1.46 (1.30-1.60)	2.74 (2.60-2.90)	4.41 (4.10-4.80)	6.50 (5.69-7.58)	1297
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	919
	01-02	*	< LOD	< LOD	< LOD	< LOD	1069
	03-04	.991 (.918-1.07)	1.20 (1.10-1.37)	2.66 (2.45-2.80)	4.50 (3.80-5.10)	6.40 (5.30-7.70)	940
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	1013
	01-02	*	< LOD	< LOD	< LOD	< LOD	1230
	03-04	.881 (.835-.930)	1.20 (1.10-1.30)	2.30 (2.20-2.59)	4.01 (3.71-4.34)	5.40 (4.47-6.70)	947
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	635
	01-02	*	< LOD	< LOD	< LOD	< LOD	567
	03-04	*	< LOD	.900 (.600-1.34)	1.99 (1.37-2.60)	3.10 (2.00-3.60)	424
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	415
	01-02	*	< LOD	< LOD	< LOD	< LOD	515
	03-04	1.09 (.911-1.30)	1.30 (.910-1.65)	3.10 (2.30-4.21)	7.10 (5.13-10.1)	11.4 (6.80-16.5)	460
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	724
	01-02	*	< LOD	< LOD	< LOD	< LOD	1054
	03-04	1.03 (.963-1.10)	1.30 (1.19-1.50)	2.61 (2.40-2.80)	4.20 (3.80-4.40)	5.33 (4.58-6.30)	882

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 12.4, 10.5, and 0.4, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',5,5',6-Heptachlorobiphenyl (PCB 178) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Non-Hispanic White Male	12-19	05-06	*	*	9	
		07-08	*	*	6	
		09-10	*	*	9	
	20-39	05-06	.735	0.151	12	
		07-08	.591	0.067	15	
		09-10	.447	0.047	15	
	40-59	05-06	2.39	0.22	12	
		07-08	1.81	0.09	16	
		09-10	2.14	0.3	14	
60+	05-06	4.18	0.26	15		
	07-08	4.07	0.3	23		
	09-10	4.06	0.31	19		
Non-Hispanic White Female	12-19	05-06	*	*	10	
		07-08	*	*	7	
		09-10	*	*	8	
	20-39	05-06	.460	0.036	16	
		07-08	*	*	13	
		09-10	*	*	17	
	40-59	05-06	1.59	0.12	13	
		07-08	1.49	0.08	17	
		09-10	1.69	0.14	16	
	60+	05-06	3.55	0.29	17	
		07-08	3.44	0.17	21	
		09-10	3.67	0.32	22	
	Non-Hispanic Black Male	12-19	05-06	.351	0.049	13
			07-08	*	*	6
			09-10	*	*	5
20-39		05-06	.854	0.136	6	
		07-08	.564	0.098	6	
		09-10	.543	0.056	6	
40-59		05-06	2.78	0.15	5	
		07-08	2.85	0.3	6	
		09-10	3.30	0.47	7	
60+		05-06	7.22	0.75	5	
		07-08	6.82	0.77	8	
		09-10	7.03	0.67	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',5,5',6-Heptachlorobiphenyl (PCB 178) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	5
	20-39	05-06	.545	0.092	7
		07-08	*	*	8
		09-10	*	*	6
	40-59	05-06	2.39	0.27	7
		07-08	2.11	0.23	8
		09-10	2.58	0.73	6
60+	05-06	7.83	1.63	5	
	07-08	6.33	0.56	7	
	09-10	6.41	1.07	6	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	7
	20-39	05-06	.382	0.039	9
		07-08	*	*	9
		09-10	*	*	7
	40-59	05-06	1.14	0.08	4
		07-08	1.58	0.21	6
		09-10	1.24	0.12	8
60+	05-06	2.79	0.67	4	
	07-08	3.23	0.45	5	
	09-10	3.58	0.22	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	8
		09-10	*	*	10
	40-59	05-06	1.12	0.08	6
		07-08	1.37	0.23	6
		09-10	.746	0.13	9
60+	05-06	2.42	0.2	3	
	07-08	3.00	0.59	5	
	09-10	2.40	0.35	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',5,5',6-Heptachlorobiphenyl (PCB 178) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	9
	20-39	09-10	*	*	12
	40-59	09-10	1.57	0.23	12
	60+	09-10	3.71	0.3	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	.917	0.134	14
	60+	09-10	2.51	0.22	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',5,5',6-Heptachlorobiphenyl (PCB 178) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1932
	01-02	*	< LOD	< LOD	< LOD	< LOD	2299
	03-04	.006 (.005-.006)	.008 (.007-.008)	.016 (.015-.018)	.029 (.026-.032)	.041 (.035-.045)	1887
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	669
	01-02	*	< LOD	< LOD	< LOD	< LOD	758
	03-04	*	< LOD	.002 (<LOD-.002)	.004 (.003-.005)	.006 (.004-.007)	590
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1263
	01-02	*	< LOD	< LOD	< LOD	< LOD	1541
	03-04	.007 (.007-.008)	.009 (.008-.010)	.018 (.017-.019)	.031 (.028-.034)	.043 (.038-.048)	1297
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	919
	01-02	*	< LOD	< LOD	< LOD	< LOD	1069
	03-04	.006 (.006-.007)	.008 (.007-.009)	.017 (.016-.018)	.030 (.025-.034)	.042 (.034-.050)	940
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	1013
	01-02	*	< LOD	< LOD	< LOD	< LOD	1230
	03-04	.005 (.005-.006)	.008 (.006-.008)	.016 (.014-.017)	.028 (.025-.031)	.040 (.034-.045)	947
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	635
	01-02	*	< LOD	< LOD	< LOD	< LOD	567
	03-04	*	< LOD	.005 (.004-.008)	.013 (.009-.020)	.022 (.014-.028)	424
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	< LOD	415
	01-02	*	< LOD	< LOD	< LOD	< LOD	515
	03-04	.006 (.005-.008)	.008 (.006-.008)	.019 (.016-.027)	.044 (.032-.061)	.077 (.045-.089)	460
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	724
	01-02	*	< LOD	< LOD	< LOD	< LOD	1054
	03-04	.006 (.006-.007)	.008 (.007-.010)	.017 (.015-.018)	.028 (.025-.031)	.037 (.033-.045)	882

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',5,5',6-Heptachlorobiphenyl (PCB 178) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	9
	20-39	05-06	.006	0.001	12
		07-08	.004	0	15
		09-10	2.93	0.34	15
	40-59	05-06	.018	0.002	12
		07-08	.013	0.001	16
		09-10	14.7	2.1	14
60+	05-06	.028	0.002	15	
	07-08	.026	0.002	23	
	09-10	24.7	1.9	19	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	.003	0	16
		07-08	*	*	13
		09-10	*	*	17
	40-59	05-06	.012	0.001	13
		07-08	.010	0.001	17
		09-10	10.7	0.9	16
	60+	05-06	.026	0.002	17
		07-08	.023	0.001	21
		09-10	22.3	2	22
Non-Hispanic Black Male	12-19	05-06	.002	0	13
		07-08	*	*	6
		09-10	*	*	5
	20-39	05-06	.005	0.001	6
		07-08	.003	0.001	6
		09-10	3.15	0.4	6
	40-59	05-06	.018	0.001	5
		07-08	.018	0.002	6
		09-10	20.1	2.6	7
	60+	05-06	.043	0.005	5
		07-08	.041	0.005	8
		09-10	37.8	4.1	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',5,5',6-Heptachlorobiphenyl (PCB 178) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	5
	20-39	05-06	.003	0.001	7
		07-08	*	*	8
		09-10	*	*	6
	40-59	05-06	.015	0.002	7
		07-08	.013	0.002	8
		09-10	14.2	3.6	6
	60+	05-06	.052	0.011	5
07-08		.038	0.004	7	
09-10		37.3	6.3	6	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	7
	20-39	05-06	.003	0	9
		07-08	*	*	9
		09-10	*	*	7
	40-59	05-06	.009	0.001	4
		07-08	.011	0.001	6
		09-10	8.64	1.1	8
	60+	05-06	.020	0.004	4
07-08		.023	0.002	5	
09-10		22.0	1.1	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	8
		09-10	*	*	10
	40-59	05-06	.008	0	6
		07-08	.009	0.002	6
		09-10	4.88	0.98	9
	60+	05-06	.019	0.003	3
07-08		.021	0.005	5	
09-10		13.2	1.8	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',5,5',6-Heptachlorobiphenyl (PCB 178) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	9
	20-39	09-10	*	*	12
	40-59	09-10	11.0	1.6	12
	60+	09-10	23.1	1.2	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	5.77	0.88	14
	60+	09-10	14.9	1.3	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB 180) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	37.5 (32.7-41.8)	62.0 (56.6-66.6)	79.3 (72.1-89.2)	1924
	01-02	19.2 (17.4-21.1)	21.8 (19.0-24.6)	42.2 (38.3-47.5)	69.7 (63.7-75.9)	87.3 (83.3-93.0)	2302
	03-04	15.1 (14.5-15.7)	18.0 (16.4-18.9)	37.1 (34.9-39.5)	63.7 (56.2-68.2)	81.5 (75.8-89.9)	1896
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	667
	01-02	*	< LOD	< LOD	12.2 (<LOD-14.8)	21.3 (14.2-26.0)	755
	03-04	3.06 (2.65-3.54)	2.97 (2.57-3.41)	5.00 (4.20-5.80)	11.1 (8.70-13.0)	14.7 (13.0-18.8)	598
20 years and older	99-00	*	< LOD	41.1 (37.6-45.2)	65.6 (60.6-69.4)	84.8 (75.6-96.1)	1257
	01-02	23.0 (20.8-25.5)	26.5 (22.7-28.6)	46.7 (41.4-51.3)	74.5 (66.7-79.8)	91.4 (85.0-99.5)	1547
	03-04	19.0 (17.9-20.1)	21.5 (18.9-24.3)	40.4 (37.9-42.8)	66.7 (61.0-70.1)	88.0 (77.8-96.7)	1298
Gender Males	99-00	*	< LOD	40.6 (34.5-45.0)	65.1 (58.6-71.4)	83.8 (75.8-96.3)	919
	01-02	21.1 (18.8-23.7)	25.1 (21.2-30.0)	46.7 (39.8-51.8)	73.8 (63.2-79.8)	86.9 (78.0-99.4)	1073
	03-04	16.1 (14.8-17.4)	18.5 (15.8-21.3)	39.6 (35.8-41.7)	68.6 (63.7-75.0)	88.3 (76.8-96.7)	947
Females	99-00	*	< LOD	34.4 (29.8-39.3)	56.7 (52.2-62.6)	74.6 (66.6-90.5)	1005
	01-02	17.5 (15.9-19.3)	18.5 (16.0-21.6)	39.7 (34.8-43.9)	64.3 (58.0-74.8)	87.9 (79.1-98.1)	1229
	03-04	14.2 (13.4-15.0)	17.8 (15.8-19.2)	35.4 (31.8-38.5)	55.7 (51.2-59.9)	74.3 (64.8-87.6)	949
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	41.7 (33.2-50.5)	57.8 (49.7-63.8)	633
	01-02	*	< LOD	18.0 (11.5-22.7)	36.9 (28.2-45.7)	54.2 (42.2-60.0)	566
	03-04	6.14 (4.91-7.67)	5.80 (3.80-7.50)	12.6 (8.97-21.5)	27.2 (22.3-35.4)	38.8 (27.2-60.7)	427
Non-Hispanic blacks	99-00	*	< LOD	39.3 (32.2-48.4)	78.4 (64.3-93.7)	117 (89.6-144)	414
	01-02	19.5 (16.5-23.1)	21.0 (16.9-23.8)	48.4 (36.7-57.9)	90.5 (73.7-101)	116 (96.1-167)	514
	03-04	15.1 (12.8-17.7)	18.1 (12.6-20.8)	39.0 (29.7-51.1)	89.9 (64.4-122)	137 (91.4-206)	464
Non-Hispanic whites	99-00	*	< LOD	39.9 (34.5-45.3)	62.3 (56.5-68.6)	79.0 (71.3-91.4)	719
	01-02	21.4 (19.1-23.9)	24.8 (21.5-28.1)	45.6 (40.2-51.0)	72.4 (63.8-78.0)	87.9 (83.8-94.3)	1059
	03-04	16.9 (15.9-18.0)	19.8 (18.4-23.1)	39.3 (35.8-42.0)	63.7 (55.0-69.1)	79.8 (70.1-89.3)	883

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 28.2, 10.5, and 0.4, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB 180) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	4.20	0.71	9
		07-08	3.50	0.65	6
		09-10	3.75	0.42	10
	20-39	05-06	10.7	2.6	12
		07-08	8.43	0.64	15
		09-10	7.12	0.75	17
	40-59	05-06	37.8	6.8	12
		07-08	25.8	1	16
		09-10	25.4	3.1	17
60+	05-06	58.6	3.4	15	
	07-08	57.6	3.4	23	
	09-10	51.3	3.5	21	
Non-Hispanic White Female	12-19	05-06	2.70	0.27	10
		07-08	2.82	0.82	7
		09-10	2.51	0.54	8
	20-39	05-06	6.45	0.74	16
		07-08	6.65	0.93	13
		09-10	5.24	0.34	19
	40-59	05-06	22.4	1.2	13
		07-08	22.3	1.1	17
		09-10	23.2	2.2	17
	60+	05-06	48.3	3.7	17
		07-08	45.7	2.2	21
		09-10	46.0	3.2	22
Non-Hispanic Black Male	12-19	05-06	4.06	0.56	13
		07-08	3.54	0.68	6
		09-10	3.08	0.21	6
	20-39	05-06	10.5	1.3	6
		07-08	7.36	0.82	6
		09-10	7.98	1.11	7
	40-59	05-06	32.8	2.3	5
		07-08	34.2	3.9	6
		09-10	35.0	3.2	7
	60+	05-06	88.0	8.6	5
		07-08	82.5	9.9	8
		09-10	78.4	6.2	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB 180) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	2.10	0.16	14
		07-08	2.02	0.3	5
		09-10	1.45	0.1	6
	20-39	05-06	6.93	1.06	7
		07-08	5.69	0.88	8
		09-10	4.76	0.81	7
	40-59	05-06	30.5	3.1	7
		07-08	26.4	2.5	8
		09-10	27.5	5.4	7
60+	05-06	88.6	17.3	5	
	07-08	73.1	4.2	7	
	09-10	79.3	9.7	7	
Mexican American Male	12-19	05-06	2.04	0.29	11
		07-08	2.24	0.37	6
		09-10	3.05	0.49	8
	20-39	05-06	5.12	0.28	9
		07-08	5.47	0.6	9
		09-10	4.06	0.49	8
	40-59	05-06	15.9	1.3	4
		07-08	20.9	2.6	6
		09-10	15.0	1	8
60+	05-06	39.3	10.1	4	
	07-08	42.0	5.5	5	
	09-10	44.8	3.6	5	
Mexican American Female	12-19	05-06	1.78	0.18	16
		07-08	**2.10	1.27	5
		09-10	1.31	0.12	7
	20-39	05-06	3.45	0.6	9
		07-08	3.88	0.21	8
		09-10	3.22	0.4	10
	40-59	05-06	15.5	1.4	6
		07-08	18.2	2.6	6
		09-10	10.8	1.4	9
60+	05-06	30.9	0.3	3	
	07-08	33.7	6.7	5	
	09-10	34.8	5	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB 180) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	2.90	0.36	11
	20-39	09-10	4.87	0.51	13
	40-59	09-10	17.7	2	13
	60+	09-10	45.0	3.1	8
All Hispanic Female	12-19	09-10	1.49	0.18	10
	20-39	09-10	3.68	0.41	14
	40-59	09-10	12.1	1.4	14
	60+	09-10	32.9	3.1	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB 180) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	.250 (.220-.270)	.410 (.370-.450)	.540 (.490-.600)	1924
	01-02	.118 (.106-.130)	.140 (.120-.160)	.280 (.250-.300)	.460 (.400-.510)	.610 (.540-.690)	2302
	03-04	.092 (.088-.096)	.114 (.102-.127)	.246 (.230-.253)	.409 (.386-.438)	.534 (.495-.598)	1896
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	667
	01-02	*	< LOD	< LOD	.060 (<LOD-.080)	.090 (.070-.140)	755
	03-04	.016 (.014-.018)	.015 (.013-.017)	.025 (.022-.030)	.050 (.046-.056)	.076 (.056-.096)	598
20 years and older	99-00	*	< LOD	.270 (.240-.300)	.440 (.410-.480)	.560 (.500-.620)	1257
	01-02	.146 (.131-.162)	.170 (.150-.190)	.300 (.280-.340)	.490 (.430-.560)	.640 (.570-.740)	1547
	03-04	.119 (.112-.126)	.138 (.125-.151)	.270 (.249-.284)	.433 (.402-.474)	.572 (.511-.635)	1298
Gender Males	99-00	*	< LOD	.260 (.220-.300)	.460 (.370-.510)	.570 (.500-.650)	919
	01-02	.131 (.117-.147)	.170 (.140-.200)	.300 (.260-.340)	.480 (.410-.550)	.620 (.530-.720)	1073
	03-04	.099 (.091-.108)	.117 (.098-.148)	.250 (.231-.274)	.422 (.388-.495)	.596 (.499-.654)	947
Females	99-00	*	< LOD	.230 (.200-.270)	.380 (.340-.410)	.510 (.430-.560)	1005
	01-02	.106 (.096-.117)	.120 (.100-.140)	.260 (.230-.280)	.420 (.380-.470)	.610 (.520-.700)	1229
	03-04	.085 (.080-.092)	.110 (.094-.123)	.230 (.209-.252)	.386 (.349-.421)	.494 (.459-.541)	949
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	.280 (.200-.320)	.390 (.320-.450)	633
	01-02	*	< LOD	.110 (.080-.160)	.260 (.200-.310)	.360 (.280-.420)	566
	03-04	.037 (.030-.047)	.035 (.024-.051)	.086 (.059-.118)	.191 (.138-.313)	.343 (.191-.405)	427
Non-Hispanic blacks	99-00	*	< LOD	.250 (.190-.300)	.500 (.350-.660)	.730 (.530-1.04)	414
	01-02	.110 (.092-.131)	.120 (.090-.140)	.290 (.220-.350)	.580 (.440-.650)	.720 (.520-1.01)	514
	03-04	.086 (.072-.102)	.098 (.070-.126)	.248 (.194-.327)	.580 (.373-.824)	.919 (.592-1.12)	464
Non-Hispanic whites	99-00	*	< LOD	.260 (.240-.300)	.430 (.380-.470)	.540 (.480-.600)	719
	01-02	.132 (.118-.148)	.160 (.140-.180)	.290 (.260-.330)	.470 (.410-.530)	.620 (.530-.730)	1059
	03-04	.104 (.097-.112)	.132 (.115-.151)	.253 (.235-.280)	.409 (.382-.449)	.512 (.478-.572)	883

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB 180) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	.023	0.004	9
		07-08	.017	0.003	6
		09-10	19.9	2.2	10
	20-39	05-06	.081	0.023	12
		07-08	.056	0.005	15
		09-10	46.7	5.2	17
	40-59	05-06	.288	0.058	12
		07-08	.188	0.008	16
		09-10	173	22	17
60+	05-06	.397	0.02	15	
	07-08	.369	0.021	23	
	09-10	311	21	21	
Non-Hispanic White Female	12-19	05-06	.014	0.002	10
		07-08	**014	0.004	7
		09-10	12.2	2.8	8
	20-39	05-06	.042	0.005	16
		07-08	.040	0.006	13
		09-10	27.9	1.9	19
	40-59	05-06	.167	0.014	13
		07-08	.147	0.008	17
		09-10	146	13	17
	60+	05-06	.350	0.025	17
		07-08	.306	0.015	21
		09-10	281	20	22
Non-Hispanic Black Male	12-19	05-06	.020	0.003	13
		07-08	.017	0.003	6
		09-10	14.1	1.3	6
	20-39	05-06	.062	0.008	6
		07-08	.041	0.004	6
		09-10	45.1	6.2	7
	40-59	05-06	.209	0.015	5
		07-08	.219	0.025	6
		09-10	216	20	7
	60+	05-06	.527	0.054	5
		07-08	.501	0.063	8
		09-10	420	35	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB 180) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.010	0.001	14
		07-08	.010	0.002	5
		09-10	6.42	0.55	6
	20-39	05-06	.040	0.006	7
		07-08	.029	0.005	8
		09-10	23.9	4.5	7
	40-59	05-06	.196	0.021	7
		07-08	.160	0.018	8
		09-10	153	27	7
	60+	05-06	.589	0.113	5
07-08		.439	0.028	7	
09-10		454	55	7	
Mexican American Male	12-19	05-06	.011	0.001	11
		07-08	.012	0.002	6
		09-10	14.3	2.4	8
	20-39	05-06	.036	0.002	9
		07-08	.037	0.004	9
		09-10	25.1	3.6	8
	40-59	05-06	.130	0.015	4
		07-08	.148	0.018	6
		09-10	104	10	8
	60+	05-06	.281	0.066	4
07-08		.298	0.029	5	
09-10		275	19	5	
Mexican American Female	12-19	05-06	.010	0.001	16
		07-08	**0.010	0.006	5
		09-10	6.10	0.52	7
	20-39	05-06	.023	0.004	9
		07-08	.023	0.002	8
		09-10	17.9	2.6	10
	40-59	05-06	.113	0.009	6
		07-08	.122	0.017	6
		09-10	70.1	11	9
	60+	05-06	.236	0.025	3
07-08		.233	0.049	5	
09-10		192	26	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB 180) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	13.6	1.8	11
	20-39	09-10	32.1	5.2	13
	40-59	09-10	121	14	13
	60+	09-10	281	13	8
All Hispanic Female	12-19	09-10	6.88	0.86	10
	20-39	09-10	20.6	2.6	14
	40-59	09-10	76.4	9.5	14
	60+	09-10	194	17	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4,4',5',6-Heptachlorobiphenyl (PCB 183) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1928
	01-02	*	< LOD	< LOD	< LOD	< LOD	2306
	03-04	1.45 (1.38-1.54)	1.60 (1.50-1.77)	3.29 (3.15-3.54)	5.86 (5.50-6.29)	7.90 (7.50-8.74)	1886
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	668
	01-02	*	< LOD	< LOD	< LOD	< LOD	757
	03-04	*	.440 (<LOD-.500)	.730 (.660-.840)	1.30 (.990-1.62)	1.91 (1.50-2.24)	590
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1260
	01-02	*	< LOD	< LOD	< LOD	< LOD	1549
	03-04	1.77 (1.67-1.88)	1.88 (1.73-2.09)	3.70 (3.34-4.00)	6.25 (5.71-6.83)	8.40 (7.70-9.55)	1296
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	919
	01-02	*	< LOD	< LOD	< LOD	< LOD	1074
	03-04	1.47 (1.34-1.61)	1.54 (1.40-1.77)	3.29 (3.10-3.54)	5.80 (5.30-6.50)	7.90 (7.20-9.20)	940
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	1009
	01-02	*	< LOD	< LOD	< LOD	< LOD	1232
	03-04	1.44 (1.34-1.55)	1.69 (1.50-1.82)	3.30 (3.05-3.80)	5.88 (5.21-6.30)	7.90 (7.31-9.24)	946
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	635
	01-02	*	< LOD	< LOD	< LOD	< LOD	567
	03-04	.703 (.579-.854)	.700 (.600-.890)	1.40 (1.19-1.90)	2.62 (2.20-3.47)	3.73 (2.60-5.60)	423
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	12.7 (<LOD-23.1)	413
	01-02	*	< LOD	< LOD	< LOD	13.0 (<LOD-14.9)	514
	03-04	1.64 (1.41-1.90)	1.60 (1.20-2.00)	4.31 (3.25-5.63)	11.0 (6.69-13.7)	14.8 (11.3-17.4)	459
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	722
	01-02	*	< LOD	< LOD	< LOD	< LOD	1061
	03-04	1.56 (1.43-1.69)	1.74 (1.55-1.90)	3.30 (3.14-3.73)	5.71 (5.20-6.29)	7.59 (6.70-8.04)	883

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 12.4, 10.5, and 0.4, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4,4',5',6-Heptachlorobiphenyl (PCB 183) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	.443	0.059	9
		07-08	*	*	6
		09-10	.493	0.043	9
	20-39	05-06	1.17	0.31	12
		07-08	.964	0.069	15
		09-10	.750	0.074	17
	40-59	05-06	3.14	0.76	12
		07-08	2.15	0.08	16
		09-10	2.27	0.39	17
60+	05-06	4.82	0.23	15	
	07-08	5.17	0.41	23	
	09-10	4.08	0.32	21	
Non-Hispanic White Female	12-19	05-06	.311	0.03	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	.694	0.043	16
		07-08	.839	0.194	13
		09-10	.716	0.05	19
	40-59	05-06	2.04	0.11	13
		07-08	2.08	0.12	17
		09-10	2.55	0.19	17
60+	05-06	4.13	0.34	17	
	07-08	4.20	0.26	21	
	09-10	4.50	0.34	22	
Non-Hispanic Black Male	12-19	05-06	.598	0.087	13
		07-08	*	*	6
		09-10	*	*	4
	20-39	05-06	1.10	0.13	6
		07-08	.927	0.087	6
		09-10	**1.68	0.51	3
	40-59	05-06	3.05	0.33	5
		07-08	3.92	0.7	6
		09-10	5.12	0.78	7
60+	05-06	7.74	0.74	5	
	07-08	8.16	1.05	8	
	09-10	9.17	1.11	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4,4',5',6-Heptachlorobiphenyl (PCB 183) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.335	0.035	14
		07-08	*	*	5
		09-10	*	*	5
	20-39	05-06	.861	0.111	7
		07-08	.801	0.164	8
		09-10	1.08	0.17	5
	40-59	05-06	3.48	0.24	7
		07-08	3.14	0.33	8
		09-10	4.52	0.95	7
	60+	05-06	9.38	2.28	5
07-08		9.22	0.69	7	
09-10		9.71	1.49	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	.479	0.055	7
	20-39	05-06	.686	0.053	9
		07-08	.781	0.056	9
		09-10	.629	0.08	8
	40-59	05-06	1.52	0.12	4
		07-08	2.22	0.34	6
		09-10	1.62	0.14	8
	60+	05-06	3.05	0.58	4
		07-08	3.84	0.67	5
		09-10	4.15	0.48	5
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	5
	20-39	05-06	.476	0.076	9
		07-08	.475	0.087	8
		09-10	.452	0.063	10
	40-59	05-06	1.86	0.13	6
		07-08	2.09	0.25	6
		09-10	1.28	0.15	9
	60+	05-06	3.36	0.07	3
		07-08	4.27	1.05	5
		09-10	3.51	0.68	6

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4,4',5',6-Heptachlorobiphenyl (PCB 183) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	.458	0.042	10
	20-39	09-10	.695	0.059	13
	40-59	09-10	1.84	0.21	13
	60+	09-10	4.23	0.36	8
All Hispanic Female	12-19	09-10	*	*	8
	20-39	09-10	.566	0.072	14
	40-59	09-10	1.51	0.16	14
	60+	09-10	3.62	0.39	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4,4',5',6-Heptachlorobiphenyl (PCB 183) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	< LOD	< LOD	1928
	01-02	*	< LOD	< LOD	< LOD	< LOD	2306
	03-04	.009 (.008-.009)	.010 (.009-.011)	.021 (.019-.024)	.039 (.036-.042)	.054 (.048-.059)	1886
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	668
	01-02	*	< LOD	< LOD	< LOD	< LOD	757
	03-04	*	.002 (<LOD-.003)	.004 (.004-.004)	.007 (.005-.009)	.009 (.007-.010)	590
20 years and older	99-00	*	< LOD	< LOD	< LOD	< LOD	1260
	01-02	*	< LOD	< LOD	< LOD	< LOD	1549
	03-04	.011 (.010-.012)	.012 (.011-.014)	.024 (.022-.027)	.042 (.038-.045)	.057 (.052-.064)	1296
Gender Males	99-00	*	< LOD	< LOD	< LOD	< LOD	919
	01-02	*	< LOD	< LOD	< LOD	< LOD	1074
	03-04	.009 (.008-.010)	.010 (.009-.011)	.022 (.019-.025)	.038 (.035-.042)	.052 (.043-.064)	940
Females	99-00	*	< LOD	< LOD	< LOD	< LOD	1009
	01-02	*	< LOD	< LOD	< LOD	< LOD	1232
	03-04	.009 (.008-.009)	.010 (.009-.012)	.021 (.019-.023)	.042 (.036-.044)	.055 (.049-.061)	946
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	< LOD	635
	01-02	*	< LOD	< LOD	< LOD	< LOD	567
	03-04	.004 (.003-.005)	.005 (.004-.006)	.009 (.007-.013)	.019 (.013-.029)	.029 (.017-.044)	423
Non-Hispanic blacks	99-00	*	< LOD	< LOD	< LOD	.070 (<LOD-.150)	413
	01-02	*	< LOD	< LOD	< LOD	.080 (<LOD-.110)	514
	03-04	.009 (.008-.011)	.009 (.008-.012)	.027 (.019-.037)	.065 (.043-.084)	.090 (.058-.120)	459
Non-Hispanic whites	99-00	*	< LOD	< LOD	< LOD	< LOD	722
	01-02	*	< LOD	< LOD	< LOD	< LOD	1061
	03-04	.010 (.009-.010)	.011 (.010-.012)	.022 (.019-.025)	.038 (.035-.042)	.049 (.046-.055)	883

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4,4',5',6-Heptachlorobiphenyl (PCB 183) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	.002	0	9
		07-08	*	*	6
		09-10	2.65	0.26	9
	20-39	05-06	** .009	0.003	12
		07-08	.006	0.001	15
		09-10	4.92	0.52	17
	40-59	05-06	.024	0.006	12
		07-08	.016	0.001	16
		09-10	15.5	2.8	17
60+	05-06	.033	0.001	15	
	07-08	.033	0.003	23	
	09-10	24.6	1.8	21	
Non-Hispanic White Female	12-19	05-06	.002	0	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	.005	0	16
		07-08	.005	0.001	13
		09-10	3.84	0.31	19
	40-59	05-06	.015	0.001	13
		07-08	.014	0.001	17
		09-10	16.0	1.1	17
60+	05-06	.030	0.002	17	
	07-08	.028	0.002	21	
	09-10	27.3	2	22	
Non-Hispanic Black Male	12-19	05-06	.003	0	13
		07-08	*	*	6
		09-10	*	*	4
	20-39	05-06	.007	0.001	6
		07-08	.005	0.001	6
		09-10	9.17	2.57	3
	40-59	05-06	.019	0.002	5
		07-08	.025	0.005	6
		09-10	31.3	4.5	7
60+	05-06	.046	0.004	5	
	07-08	.050	0.007	8	
	09-10	49.4	6.5	9	

† See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4,4',5',6-Heptachlorobiphenyl (PCB 183) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.002	0	14
		07-08	*	*	5
		09-10	*	*	5
	20-39	05-06	.005	0.001	7
		07-08	.004	0.001	8
		09-10	5.38	1	5
	40-59	05-06	.022	0.002	7
		07-08	.019	0.002	8
		09-10	25.1	4.7	7
	60+	05-06	.063	0.015	5
07-08		.055	0.004	7	
09-10		55.9	8.9	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	2.25	0.27	7
	20-39	05-06	.005	0	9
		07-08	.005	0	9
		09-10	3.93	0.68	8
	40-59	05-06	.012	0.001	4
		07-08	.016	0.002	6
		09-10	11.2	1.3	8
	60+	05-06	.022	0.004	4
		07-08	.027	0.004	5
		09-10	25.6	3	5
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	5
	20-39	05-06	.003	0.001	9
		07-08	.003	0	8
		09-10	2.51	0.39	10
	40-59	05-06	.014	0.001	6
		07-08	.014	0.002	6
		09-10	8.34	1.16	9
	60+	05-06	.026	0.003	3
		07-08	.030	0.008	5
		09-10	19.2	3.6	6

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4,4',5',6-Heptachlorobiphenyl (PCB 183) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	2.14	0.21	10
	20-39	09-10	4.54	0.59	13
	40-59	09-10	12.6	1.5	13
	60+	09-10	26.5	1.9	8
All Hispanic Female	12-19	09-10	*	*	8
	20-39	09-10	3.16	0.43	14
	40-59	09-10	9.50	1.08	14
	60+	09-10	21.4	2.3	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4',5,5',6-Heptachlorobiphenyl (PCB 187) (lipid adjusted) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	17.7 (15.6-20.4)	24.8 (22.0-27.7)	1930
	01-02	*	< LOD	12.2 (10.6-13.8)	21.7 (19.6-23.7)	28.1 (26.8-29.7)	2307
	03-04	4.23 (3.96-4.50)	4.60 (4.20-5.23)	10.1 (9.42-10.5)	17.2 (16.1-18.1)	24.3 (20.5-27.8)	1889
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	667
	01-02	*	< LOD	< LOD	< LOD	< LOD	758
	03-04	1.00 (.859-1.17)	1.00 (.880-1.10)	1.66 (1.50-1.99)	3.20 (2.50-4.34)	5.00 (3.70-6.07)	594
20 years and older	99-00	*	< LOD	< LOD	19.3 (16.8-21.8)	26.0 (24.1-29.0)	1263
	01-02	*	< LOD	13.3 (12.0-15.2)	23.0 (20.9-24.7)	29.2 (27.3-32.0)	1549
	03-04	5.20 (4.83-5.60)	5.71 (5.01-6.19)	10.9 (10.3-11.7)	18.1 (16.9-19.5)	25.9 (22.1-32.1)	1295
Gender Males	99-00	*	< LOD	< LOD	17.8 (15.8-19.6)	25.9 (21.6-29.8)	917
	01-02	*	< LOD	12.7 (<LOD-15.8)	22.5 (19.4-24.1)	27.7 (25.2-30.3)	1075
	03-04	4.34 (3.97-4.75)	4.50 (4.00-5.40)	10.4 (9.21-10.9)	17.9 (16.1-19.5)	25.1 (20.4-30.9)	939
Females	99-00	*	< LOD	< LOD	17.7 (15.1-21.7)	24.2 (21.6-27.0)	1013
	01-02	*	< LOD	11.9 (<LOD-13.0)	21.3 (18.5-23.5)	28.5 (26.2-31.3)	1232
	03-04	4.12 (3.84-4.41)	4.67 (4.10-5.30)	9.85 (8.83-10.5)	16.4 (15.3-17.9)	24.2 (19.1-27.8)	950
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	17.6 (15.1-19.1)	636
	01-02	*	< LOD	< LOD	10.8 (<LOD-13.4)	15.7 (12.7-18.2)	567
	03-04	1.79 (1.47-2.20)	1.58 (1.26-2.00)	3.96 (2.70-5.90)	7.86 (5.96-10.3)	11.6 (9.41-14.9)	426
Non-Hispanic blacks	99-00	*	< LOD	15.5 (<LOD-21.1)	31.6 (26.0-39.0)	47.1 (36.6-72.1)	412
	01-02	*	< LOD	16.5 (12.3-21.0)	30.3 (22.9-40.6)	44.8 (30.3-61.9)	515
	03-04	5.09 (4.39-5.90)	5.40 (4.20-6.21)	13.9 (10.6-17.7)	31.7 (22.7-46.4)	51.5 (31.7-76.5)	458
Non-Hispanic whites	99-00	*	< LOD	< LOD	16.8 (14.9-18.6)	22.0 (19.1-25.2)	727
	01-02	*	< LOD	12.5 (10.8-14.6)	21.7 (18.9-23.7)	27.4 (25.2-29.5)	1061
	03-04	4.47 (4.17-4.79)	5.00 (4.40-5.70)	10.1 (9.26-10.8)	16.5 (15.3-17.9)	21.1 (19.1-24.2)	884

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 12.4, 10.5, and 0.4, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4',5,5',6-Heptachlorobiphenyl (PCB 187) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	1.15	0.17	9
		07-08	.986	0.243	6
		09-10	1.23	0.15	10
	20-39	05-06	3.08	0.71	12
		07-08	2.65	0.22	15
		09-10	2.07	0.21	17
	40-59	05-06	8.32	0.66	12
		07-08	6.81	0.33	16
		09-10	7.31	1.06	17
60+	05-06	16.6	1	15	
	07-08	16.8	1.3	23	
	09-10	13.8	1.2	21	
Non-Hispanic White Female	12-19	05-06	.832	0.069	10
		07-08	*	*	7
		09-10	.852	0.205	8
	20-39	05-06	1.77	0.13	16
		07-08	2.19	0.54	13
		09-10	1.91	0.13	17
	40-59	05-06	6.07	0.42	13
		07-08	5.76	0.32	17
		09-10	6.30	0.44	17
	60+	05-06	14.0	1.1	17
		07-08	13.8	0.8	21
		09-10	15.1	1.4	22
Non-Hispanic Black Male	12-19	05-06	1.68	0.29	13
		07-08	1.56	0.3	6
		09-10	1.27	0.2	4
	20-39	05-06	3.61	0.61	6
		07-08	2.73	0.31	6
		09-10	**4.18	1.32	5
	40-59	05-06	12.3	1	5
		07-08	12.8	1.9	6
		09-10	16.6	2.5	7
	60+	05-06	32.1	3.5	5
		07-08	31.5	4.1	8
		09-10	32.4	3.9	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4',5,5',6-Heptachlorobiphenyl (PCB 187) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.956	0.08	14
		07-08	.872	0.162	5
		09-10	** .512	0.163	3
	20-39	05-06	2.57	0.42	7
		07-08	2.20	0.31	8
		09-10	2.41	0.51	6
	40-59	05-06	11.3	1.1	7
		07-08	9.55	1.07	8
		09-10	12.5	3.5	7
	60+	05-06	37.6	9.4	5
07-08		32.7	3.2	7	
09-10		31.7	5.3	7	
Mexican American Male	12-19	05-06	.633	0.083	11
		07-08	.656	0.133	6
		09-10	1.05	0.28	6
	20-39	05-06	1.72	0.15	9
		07-08	1.92	0.22	9
		09-10	1.44	0.13	8
	40-59	05-06	4.78	0.5	4
		07-08	6.80	0.92	6
		09-10	5.04	0.42	8
	60+	05-06	10.6	2.5	4
07-08		13.1	1.9	5	
09-10		13.9	1.2	5	
Mexican American Female	12-19	05-06	.615	0.063	16
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	1.05	0.2	9
		07-08	1.40	0.13	8
		09-10	1.02	0.12	10
	40-59	05-06	4.80	0.3	6
		07-08	5.66	0.8	6
		09-10	3.70	0.48	9
	60+	05-06	10.4	0.6	3
07-08		12.7	2.8	5	
09-10		11.0	1.4	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4',5,5',6-Heptachlorobiphenyl (PCB 187) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	1.10	0.19	9
	20-39	09-10	1.79	0.2	13
	40-59	09-10	6.30	0.78	13
	60+	09-10	15.3	1.5	8
All Hispanic Female	12-19	09-10	*	*	8
	20-39	09-10	1.29	0.18	14
	40-59	09-10	4.24	0.54	14
	60+	09-10	11.3	0.9	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4',5,5',6-Heptachlorobiphenyl (PCB 187) (whole weight) (1999 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	99-00	*	< LOD	< LOD	.120 (.110-.130)	.170 (.140-.180)	1930
	01-02	*	< LOD	.080 (.070-.090)	.140 (.130-.160)	.200 (.180-.220)	2307
	03-04	.026 (.024-.028)	.029 (.027-.032)	.065 (.061-.069)	.115 (.106-.125)	.167 (.139-.197)	1889
Age group 12-19 years	99-00	*	< LOD	< LOD	< LOD	< LOD	667
	01-02	*	< LOD	< LOD	< LOD	< LOD	758
	03-04	.005 (.004-.006)	.005 (.004-.006)	.009 (.007-.010)	.016 (.013-.019)	.023 (.016-.029)	594
20 years and older	99-00	*	< LOD	< LOD	.130 (.110-.140)	.180 (.160-.190)	1263
	01-02	*	< LOD	.090 (.080-.100)	.150 (.130-.180)	.210 (.190-.230)	1549
	03-04	.033 (.030-.035)	.036 (.032-.040)	.071 (.067-.075)	.124 (.112-.139)	.172 (.143-.215)	1295
Gender Males	99-00	*	< LOD	< LOD	.120 (.100-.140)	.180 (.140-.200)	917
	01-02	*	< LOD	.080 (<LOD-.100)	.150 (.130-.160)	.190 (.170-.230)	1075
	03-04	.027 (.024-.030)	.030 (.026-.035)	.067 (.061-.072)	.116 (.102-.137)	.160 (.137-.215)	939
Females	99-00	*	< LOD	< LOD	.120 (.110-.130)	.160 (.140-.180)	1013
	01-02	*	< LOD	.080 (<LOD-.090)	.140 (.120-.150)	.200 (.180-.220)	1232
	03-04	.025 (.023-.027)	.029 (.026-.033)	.063 (.056-.070)	.115 (.104-.125)	.168 (.141-.191)	950
Race/ethnicity Mexican Americans	99-00	*	< LOD	< LOD	< LOD	.120 (.100-.130)	636
	01-02	*	< LOD	< LOD	.080 (<LOD-.100)	.100 (.090-.120)	567
	03-04	.011 (.009-.013)	.010 (.007-.015)	.025 (.018-.038)	.057 (.042-.079)	.094 (.059-.110)	426
Non-Hispanic blacks	99-00	*	< LOD	.090 (<LOD-.130)	.200 (.160-.230)	.290 (.210-.530)	412
	01-02	*	< LOD	.100 (.070-.120)	.190 (.150-.260)	.290 (.190-.380)	515
	03-04	.029 (.025-.034)	.032 (.024-.037)	.083 (.070-.109)	.191 (.140-.273)	.330 (.228-.468)	458
Non-Hispanic whites	99-00	*	< LOD	< LOD	.110 (.100-.130)	.150 (.130-.170)	727
	01-02	*	< LOD	.080 (.070-.090)	.140 (.120-.160)	.190 (.170-.220)	1061
	03-04	.028 (.026-.030)	.032 (.029-.036)	.065 (.061-.071)	.111 (.101-.124)	.153 (.132-.172)	884

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4',5,5',6-Heptachlorobiphenyl (PCB 187) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	.006	0.001	9
		07-08	.005	0.001	6
		09-10	6.57	0.87	10
	20-39	05-06	.023	0.006	12
		07-08	.018	0.002	15
		09-10	13.6	1.5	17
	40-59	05-06	.063	0.005	12
		07-08	.049	0.002	16
		09-10	49.9	7.6	17
60+	05-06	.112	0.006	15	
	07-08	.107	0.008	23	
	09-10	83.3	7.6	21	
Non-Hispanic White Female	12-19	05-06	.004	0	10
		07-08	*	*	7
		09-10	4.13	1.03	8
	20-39	05-06	.011	0.001	16
		07-08	.013	0.004	13
		09-10	10.2	0.7	17
	40-59	05-06	.045	0.004	13
		07-08	.038	0.002	17
		09-10	39.5	2.6	17
	60+	05-06	.102	0.008	17
		07-08	.093	0.005	21
		09-10	91.3	8.1	22
Non-Hispanic Black Male	12-19	05-06	.008	0.001	13
		07-08	.007	0.001	6
		09-10	5.91	1.18	4
	20-39	05-06	.021	0.004	6
		07-08	.015	0.002	6
		09-10	**22.6	6.8	5
	40-59	05-06	.078	0.006	5
		07-08	.082	0.012	6
		09-10	101	14	7
	60+	05-06	.191	0.02	5
		07-08	.193	0.028	8
		09-10	174	23	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4',5,5',6-Heptachlorobiphenyl (PCB 187) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.005	0	14
		07-08	.004	0.001	5
		09-10	**2.16	0.66	3
	20-39	05-06	.015	0.003	7
		07-08	.011	0.002	8
		09-10	12.2	2.8	6
	40-59	05-06	.072	0.007	7
		07-08	.058	0.008	8
		09-10	69.1	17.3	7
	60+	05-06	.251	0.063	5
07-08		.197	0.021	7	
09-10		182	31	7	
Mexican American Male	12-19	05-06	.003	0	11
		07-08	.004	0.001	6
		09-10	4.89	1.36	6
	20-39	05-06	.012	0.001	9
		07-08	.013	0.002	9
		09-10	8.83	0.98	8
	40-59	05-06	.039	0.006	4
		07-08	.048	0.007	6
		09-10	34.9	3.8	8
	60+	05-06	.076	0.017	4
07-08		.092	0.01	5	
09-10		85.5	7.2	5	
Mexican American Female	12-19	05-06	.003	0	16
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	.007	0.001	9
		07-08	.008	0.001	8
		09-10	5.64	0.7	10
	40-59	05-06	.035	0.001	6
		07-08	.038	0.005	6
		09-10	24.3	3.8	9
	60+	05-06	.080	0.012	3
07-08		.088	0.02	5	
09-10		60.7	7.4	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,4',5,5',6-Heptachlorobiphenyl (PCB 187) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	5.07	0.92	9
	20-39	09-10	11.6	1.7	13
	40-59	09-10	43.2	5.5	13
	60+	09-10	95.5	7.5	8
All Hispanic Female	12-19	09-10	*	*	8
	20-39	09-10	7.21	1.05	14
	40-59	09-10	26.8	3.6	14
	60+	09-10	67.1	5.5	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,5'-Octachlorobiphenyl (PCB 194) (lipid adjusted) (2001 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	01-02	*	< LOD	11.1 (<LOD-11.9)	18.2 (16.5-19.5)	23.7 (21.0-27.0)	2279
	03-04	2.69 (2.53-2.85)	4.19 (3.55-4.70)	8.47 (7.79-9.06)	14.3 (13.3-16.0)	19.1 (17.6-20.8)	1835
Age group 12-19 years	01-02	*	< LOD	< LOD	< LOD	< LOD	746
	03-04	*	< LOD	1.11 (.700-1.57)	2.40 (1.70-3.57)	5.18 (2.80-6.81)	572
20 years and older	01-02	*	< LOD	12.0 (11.0-13.3)	19.1 (17.7-20.5)	25.3 (22.7-28.0)	1533
	03-04	3.64 (3.40-3.89)	4.95 (4.56-5.42)	9.30 (8.62-9.90)	15.3 (13.9-17.1)	20.1 (18.1-21.9)	1263
Gender Males	01-02	*	< LOD	12.3 (10.6-14.1)	19.2 (17.2-21.2)	25.2 (21.7-29.0)	1059
	03-04	2.95 (2.61-3.35)	4.47 (3.55-5.20)	9.60 (8.30-10.9)	17.1 (14.2-18.8)	21.8 (19.8-25.6)	913
Females	01-02	*	< LOD	< LOD	17.0 (14.7-18.8)	21.9 (19.3-26.2)	1220
	03-04	2.45 (2.28-2.64)	4.00 (3.39-4.49)	7.50 (7.01-8.39)	12.7 (11.2-13.6)	16.6 (13.7-18.6)	922
Race/ethnicity Mexican Americans	01-02	*	< LOD	< LOD	< LOD	14.3 (10.5-17.6)	561
	03-04	.845 (.582-1.23)	.900 (.640-1.49)	2.90 (1.79-4.76)	7.21 (4.80-8.90)	9.50 (7.40-15.0)	410
Non-Hispanic blacks	01-02	*	< LOD	12.3 (<LOD-15.3)	22.6 (18.0-27.5)	29.8 (23.7-41.1)	508
	03-04	2.45 (1.94-3.08)	3.62 (2.70-4.49)	8.83 (6.80-11.2)	18.1 (13.0-23.2)	28.3 (18.9-35.6)	450
Non-Hispanic whites	01-02	*	< LOD	11.9 (10.9-13.1)	18.8 (17.1-20.2)	24.1 (20.9-28.0)	1048
	03-04	3.25 (2.97-3.56)	4.90 (4.19-5.42)	9.08 (8.36-9.80)	14.7 (13.5-16.6)	19.1 (17.4-21.2)	861

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02 and 03-04 are 10.5 and 0.4.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,5'-Octachlorobiphenyl (PCB 194) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	.599	0.081	9
		07-08	.622	0.099	6
		09-10	.530	0.073	7
	20-39	05-06	2.31	0.63	12
		07-08	1.91	0.2	15
		09-10	1.46	0.15	17
	40-59	05-06	8.60	1.06	12
		07-08	7.17	0.32	16
		09-10	6.67	0.72	17
60+	05-06	15.1	0.9	15	
	07-08	15.5	0.7	23	
	09-10	14.7	0.8	21	
Non-Hispanic White Female	12-19	05-06	.386	0.061	10
		07-08	.691	0.184	7
		09-10	.447	0.076	8
	20-39	05-06	1.30	0.16	16
		07-08	1.64	0.16	13
		09-10	1.08	0.08	18
	40-59	05-06	4.30	0.54	13
		07-08	5.43	0.35	17
		09-10	5.07	0.42	17
60+	05-06	11.3	0.8	17	
	07-08	11.7	0.6	21	
	09-10	11.4	0.8	22	
Non-Hispanic Black Male	12-19	05-06	.604	0.084	13
		07-08	*	*	6
		09-10	.678	0.125	6
	20-39	05-06	2.19	0.28	6
		07-08	1.75	0.2	6
		09-10	1.25	0.21	6
	40-59	05-06	8.55	0.39	5
		07-08	8.95	0.86	6
		09-10	9.34	1.17	7
60+	05-06	21.6	2.2	5	
	07-08	20.8	2.1	8	
	09-10	20.5	1.9	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,5'-Octachlorobiphenyl (PCB 194) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.362	0.042	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	1.30	0.2	7
		07-08	1.11	0.26	8
		09-10	1.06	0.2	7
	40-59	05-06	6.26	0.84	7
		07-08	6.00	0.7	8
		09-10	5.54	0.96	7
	60+	05-06	18.1	3.4	5
07-08		16.9	1	7	
09-10		17.4	2	7	
Mexican American Male	12-19	05-06	.501	0.138	11
		07-08	.465	0.077	6
		09-10	.539	0.068	8
	20-39	05-06	.988	0.082	9
		07-08	**1.76	0.57	9
		09-10	.805	0.112	8
	40-59	05-06	3.83	0.39	4
		07-08	5.26	0.76	6
		09-10	3.65	0.29	8
	60+	05-06	9.53	2.54	4
07-08		12.2	1.7	5	
09-10		11.5	1.1	5	
Mexican American Female	12-19	05-06	.331	0.038	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	.641	0.109	9
		07-08	.943	0.049	8
		09-10	.629	0.094	9
	40-59	05-06	3.25	0.45	6
		07-08	3.73	0.95	6
		09-10	2.38	0.4	9
	60+	05-06	6.74	0.23	3
07-08		7.77	1.42	5	
09-10		7.96	1.28	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,5'-Octachlorobiphenyl (PCB 194) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	.526	0.049	11
	20-39	09-10	.942	0.102	13
	40-59	09-10	4.20	0.42	13
	60+	09-10	11.6	0.8	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	.688	0.079	13
	40-59	09-10	2.66	0.3	14
	60+	09-10	7.53	0.81	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,5'-Octachlorobiphenyl (PCB 194) (whole weight) (2001 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	01-02	*	< LOD	.070 (<LOD-.080)	.120 (.110-.140)	.160 (.150-.190)	2279
	03-04	.016 (.015-.017)	.026 (.022-.028)	.056 (.052-.060)	.096 (.091-.103)	.129 (.116-.139)	1835
Age group 12-19 years	01-02	*	< LOD	< LOD	< LOD	< LOD	746
	03-04	*	< LOD	.006 (.004-.008)	.013 (.009-.020)	.023 (.013-.035)	572
20 years and older	01-02	*	< LOD	.080 (.070-.090)	.130 (.110-.150)	.170 (.150-.200)	1533
	03-04	.023 (.021-.024)	.031 (.027-.035)	.061 (.057-.065)	.103 (.094-.113)	.133 (.122-.145)	1263
Gender Males	01-02	*	< LOD	.080 (.070-.090)	.140 (.110-.160)	.170 (.150-.210)	1059
	03-04	.018 (.016-.021)	.027 (.023-.034)	.061 (.054-.069)	.106 (.095-.121)	.142 (.129-.166)	913
Females	01-02	*	< LOD	< LOD	.110 (.090-.130)	.150 (.130-.180)	1220
	03-04	.015 (.014-.016)	.024 (.020-.027)	.051 (.047-.056)	.088 (.080-.096)	.112 (.103-.117)	922
Race/ethnicity Mexican Americans	01-02	*	< LOD	< LOD	< LOD	.100 (.080-.110)	561
	03-04	.005 (.004-.008)	.006 (.004-.010)	.019 (.012-.031)	.049 (.033-.064)	.081 (.051-.118)	410
Non-Hispanic blacks	01-02	*	< LOD	.080 (<LOD-.090)	.150 (.100-.180)	.200 (.140-.250)	508
	03-04	.014 (.011-.018)	.020 (.014-.026)	.054 (.045-.063)	.120 (.081-.155)	.172 (.123-.202)	450
Non-Hispanic whites	01-02	*	< LOD	.080 (.070-.090)	.130 (.110-.150)	.170 (.150-.190)	1048
	03-04	.020 (.018-.022)	.029 (.026-.034)	.061 (.056-.066)	.099 (.090-.106)	.132 (.116-.143)	861

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,5'-Octachlorobiphenyl (PCB 194) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	.003	0	9
		07-08	.003	0	6
		09-10	2.75	0.39	7
	20-39	05-06	** .018	0.005	12
		07-08	.013	0.001	15
		09-10	9.65	1.14	17
	40-59	05-06	.065	0.008	12
		07-08	.052	0.003	16
		09-10	45.2	4.9	17
60+	05-06	.102	0.005	15	
	07-08	.100	0.005	23	
	09-10	88.9	4.5	21	
Non-Hispanic White Female	12-19	05-06	.002	0	10
		07-08	** .003	0.001	7
		09-10	2.16	0.4	8
	20-39	05-06	.008	0.001	16
		07-08	.010	0.001	13
		09-10	5.88	0.48	18
	40-59	05-06	.032	0.005	13
		07-08	.036	0.003	17
		09-10	32.1	2.8	17
	60+	05-06	.082	0.006	17
		07-08	.079	0.004	21
		09-10	69.6	4.8	22
Non-Hispanic Black Male	12-19	05-06	.003	0	13
		07-08	*	*	6
		09-10	3.17	0.7	6
	20-39	05-06	.013	0.002	6
		07-08	.010	0.001	6
		09-10	7.29	1.27	6
	40-59	05-06	.054	0.003	5
		07-08	.057	0.006	6
		09-10	56.5	5.4	7
	60+	05-06	.131	0.017	5
		07-08	.127	0.014	8
		09-10	110	11	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,5'-Octachlorobiphenyl (PCB 194) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.002	0	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	.007	0.001	7
		07-08	.006	0.001	8
		09-10	5.33	1.09	7
	40-59	05-06	.040	0.005	7
		07-08	.036	0.005	8
		09-10	30.8	4.7	7
	60+	05-06	.120	0.022	5
		07-08	.102	0.007	7
		09-10	99.6	11.2	7
Mexican American Male	12-19	05-06	.003	0.001	11
		07-08	.002	0	6
		09-10	2.54	0.33	8
	20-39	05-06	.007	0.001	9
		07-08	** .012	0.004	9
		09-10	4.96	0.75	8
	40-59	05-06	.031	0.004	4
		07-08	.037	0.005	6
		09-10	25.4	2.7	8
	60+	05-06	.069	0.018	4
		07-08	.086	0.009	5
		09-10	70.3	5.2	5
Mexican American Female	12-19	05-06	.002	0	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	.004	0.001	9
		07-08	.005	0	8
		09-10	3.50	0.61	9
	40-59	05-06	.024	0.003	6
		07-08	.025	0.006	6
		09-10	15.5	3	9
	60+	05-06	.052	0.007	3
		07-08	.054	0.011	5
		09-10	43.7	6.6	6

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,5'-Octachlorobiphenyl (PCB 194) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	2.46	0.25	11
	20-39	09-10	6.22	1.02	13
	40-59	09-10	28.8	3.1	13
	60+	09-10	72.5	3.6	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	3.85	0.51	13
	40-59	09-10	16.7	2.1	14
	60+	09-10	44.3	4.3	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,6-Octachlorobiphenyl (PCB 195) (lipid adjusted) (2001 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	01-02	*	< LOD	< LOD	< LOD	< LOD	2230
	03-04	*	.900 (<LOD-1.01)	1.98 (1.80-2.10)	3.40 (3.10-3.60)	4.51 (3.90-5.18)	1820
Age group 12-19 years	01-02	*	< LOD	< LOD	< LOD	< LOD	716
	03-04	*	< LOD	< LOD	< LOD	1.74 (.720-3.82)	567
20 years and older	01-02	*	< LOD	< LOD	< LOD	< LOD	1514
	03-04	.800 (.721-.888)	1.10 (.980-1.20)	2.10 (2.00-2.30)	3.53 (3.20-3.74)	4.68 (4.12-5.19)	1253
Gender Males	01-02	*	< LOD	< LOD	< LOD	< LOD	1035
	03-04	*	.800 (<LOD-1.00)	2.08 (1.82-2.20)	3.50 (3.12-3.70)	4.60 (3.82-5.40)	904
Females	01-02	*	< LOD	< LOD	< LOD	< LOD	1195
	03-04	*	.970 (<LOD-1.10)	1.85 (1.64-2.09)	3.30 (2.86-3.60)	4.50 (3.57-5.25)	916
Race/ethnicity Mexican Americans	01-02	*	< LOD	< LOD	< LOD	< LOD	544
	03-04	*	< LOD	< LOD	1.80 (1.11-2.40)	2.40 (1.80-3.50)	407
Non-Hispanic blacks	01-02	*	< LOD	< LOD	< LOD	< LOD	490
	03-04	.709 (<LOD-.870)	.820 (<LOD-1.14)	2.00 (1.65-2.57)	4.18 (3.16-5.30)	6.90 (4.18-8.10)	444
Non-Hispanic whites	01-02	*	< LOD	< LOD	< LOD	< LOD	1037
	03-04	.749 (<LOD-.850)	1.00 (.800-1.18)	2.10 (1.90-2.30)	3.40 (3.10-3.61)	4.44 (3.80-5.19)	856

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02 and 03-04 are 28.1 and 0.7.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,6-Octachlorobiphenyl (PCB 195) (lipid adjusted) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
	20-39	05-06	.487	0.129	12
		07-08	*	*	15
	40-59	05-06	1.50	0.29	12
		07-08	1.25	0.05	16
60+	05-06	2.52	0.16	15	
	07-08	2.74	0.16	23	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
	20-39	05-06	*	*	16
		07-08	*	*	13
	40-59	05-06	.936	0.067	13
		07-08	1.14	0.08	17
60+	05-06	2.04	0.16	17	
	07-08	2.38	0.13	21	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
	20-39	05-06	.435	0.047	6
		07-08	*	*	6
	40-59	05-06	1.35	0.13	5
		07-08	1.80	0.23	6
60+	05-06	3.40	0.27	5	
	07-08	3.99	0.53	8	
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
	20-39	05-06	.348	0.044	7
		07-08	*	*	8
	40-59	05-06	1.41	0.15	7
		07-08	1.35	0.17	8
60+	05-06	3.82	0.76	5	
	07-08	3.94	0.26	7	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06 and 07-08 are 0.31 and 0.3.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,6-Octachlorobiphenyl (PCB 195) (lipid adjusted) (2005 – 2008)††

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Mexican American Male	12-19	05-06	*	*	11	
		07-08	*	*	6	
	20-39	05-06	*	*	9	
		07-08	*	*	9	
	40-59	05-06	.766	0.083	4	
		07-08	1.02	0.11	6	
	60+	05-06	1.69	0.4	4	
		07-08	2.24	0.29	5	
	Mexican American Female	12-19	05-06	*	*	16
			07-08	*	*	5
20-39		05-06	*	*	9	
		07-08	*	*	8	
40-59		05-06	.780	0.083	6	
		07-08	.986	0.187	6	
60+		05-06	1.47	0.06	3	
		07-08	1.98	0.39	5	

††Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06 and 07-08 are 0.31 and 0.3.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,6-Octachlorobiphenyl (PCB 195) (whole weight) (2001 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	01-02	*	< LOD	< LOD	< LOD	< LOD	2230
	03-04	*	.005 (<LOD-.006)	.012 (.012-.013)	.022 (.020-.025)	.031 (.027-.034)	1820
Age group 12-19 years	01-02	*	< LOD	< LOD	< LOD	< LOD	716
	03-04	*	< LOD	< LOD	< LOD	.007 (.004-.017)	567
20 years and older	01-02	*	< LOD	< LOD	< LOD	< LOD	1514
	03-04	.005 (.004-.006)	.007 (.006-.007)	.014 (.012-.015)	.023 (.021-.026)	.032 (.028-.035)	1253
Gender Males	01-02	*	< LOD	< LOD	< LOD	< LOD	1035
	03-04	*	.005 (<LOD-.006)	.013 (.012-.014)	.022 (.020-.025)	.031 (.025-.035)	904
Females	01-02	*	< LOD	< LOD	< LOD	< LOD	1195
	03-04	*	.006 (<LOD-.007)	.012 (.011-.013)	.021 (.019-.025)	.031 (.026-.035)	916
Race/ethnicity Mexican Americans	01-02	*	< LOD	< LOD	< LOD	< LOD	544
	03-04	*	< LOD	< LOD	.012 (.008-.018)	.018 (.013-.025)	407
Non-Hispanic blacks	01-02	*	< LOD	< LOD	< LOD	< LOD	490
	03-04	.004 (<LOD-.005)	.004 (<LOD-.006)	.012 (.010-.016)	.027 (.019-.034)	.041 (.029-.048)	444
Non-Hispanic whites	01-02	*	< LOD	< LOD	< LOD	< LOD	1037
	03-04	.005 (<LOD-.005)	.006 (.005-.007)	.013 (.012-.014)	.022 (.020-.025)	.030 (.027-.033)	856

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,6-Octachlorobiphenyl (PCB 195) (whole weight) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
	20-39	05-06	.004	0.001	12
		07-08	*	*	15
	40-59	05-06	.011	0.002	12
		07-08	.009	0	16
60+	05-06	.017	0.001	15	
	07-08	.018	0.001	23	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
	20-39	05-06	*	*	16
		07-08	*	*	13
	40-59	05-06	.007	0.001	13
		07-08	.008	0.001	17
60+	05-06	.015	0.001	17	
	07-08	.016	0.001	21	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
	20-39	05-06	.003	0	6
		07-08	*	*	6
	40-59	05-06	.009	0.001	5
		07-08	.012	0.002	6
60+	05-06	.020	0.001	5	
	07-08	.024	0.004	8	
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
	20-39	05-06	.002	0	7
		07-08	*	*	8
	40-59	05-06	.009	0.001	7
		07-08	.008	0.001	8
60+	05-06	.025	0.005	5	
	07-08	.024	0.002	7	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,6-Octachlorobiphenyl (PCB 195) (whole weight) (2005 – 2008)‡‡

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Mexican American Male	12-19	05-06	*	*	11	
		07-08	*	*	6	
	20-39	05-06	*	*	9	
		07-08	*	*	9	
	40-59	05-06	.006	0.001	4	
		07-08	.007	0.001	6	
	60+	05-06	.012	0.003	4	
		07-08	.016	0.001	5	
	Mexican American Female	12-19	05-06	*	*	16
			07-08	*	*	5
20-39		05-06	*	*	9	
		07-08	*	*	8	
40-59		05-06	.006	0.001	6	
		07-08	.006	0.001	6	
60+		05-06	.011	0.002	3	
		07-08	.014	0.003	5	

‡‡Not measured after Survey years 2007-2008.

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,6' & 2,2',3,4,4',5,5',6-Octachlorobiphenyl (PCB 196 & 203) (lipid adjusted) (2001 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	01-02	*	< LOD	< LOD	14.2 (13.0-15.7)	19.2 (17.4-20.9)	2299
	03-04	2.61 (2.44-2.79)	3.40 (3.01-3.80)	6.70 (6.16-7.23)	11.8 (10.8-12.7)	15.0 (13.2-17.4)	1878
Age group 12-19 years	01-02	*	< LOD	< LOD	< LOD	< LOD	755
	03-04	.437 (<LOD-.546)	.520 (.400-.700)	1.10 (.900-1.42)	2.41 (1.86-3.19)	3.59 (2.93-4.20)	587
20 years and older	01-02	*	< LOD	< LOD	15.0 (13.7-17.0)	19.9 (18.2-21.4)	1544
	03-04	3.37 (3.15-3.61)	4.07 (3.74-4.46)	7.30 (6.79-8.20)	12.4 (11.5-13.2)	15.9 (13.4-19.5)	1291
Gender Males	01-02	*	< LOD	< LOD	14.6 (13.3-16.5)	19.4 (16.3-21.2)	1071
	03-04	2.77 (2.49-3.08)	3.45 (3.07-3.98)	6.92 (6.12-7.71)	12.5 (11.2-13.7)	16.3 (13.7-23.1)	935
Females	01-02	*	< LOD	< LOD	13.8 (11.9-15.9)	19.1 (17.0-21.3)	1228
	03-04	2.46 (2.27-2.66)	3.32 (2.83-3.80)	6.68 (6.12-7.20)	11.1 (9.74-12.3)	13.4 (12.8-14.9)	943
Race/ethnicity Mexican Americans	01-02	*	< LOD	< LOD	< LOD	11.1 (<LOD-12.5)	565
	03-04	.947 (.689-1.30)	1.00 (.700-1.50)	2.80 (1.60-4.30)	5.90 (4.30-7.40)	8.35 (6.00-12.3)	424
Non-Hispanic blacks	01-02	*	< LOD	< LOD	17.6 (14.2-21.0)	23.1 (19.6-30.2)	513
	03-04	2.45 (2.06-2.90)	2.90 (2.33-3.80)	7.18 (5.80-9.00)	13.8 (11.5-16.8)	21.6 (14.0-32.3)	453
Non-Hispanic whites	01-02	*	< LOD	< LOD	14.7 (13.6-16.5)	19.6 (18.1-21.3)	1058
	03-04	3.01 (2.76-3.27)	3.88 (3.44-4.20)	7.10 (6.32-8.20)	11.8 (10.8-13.1)	15.4 (12.9-19.0)	882

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02 and 03-04 are 10.5 and 0.4.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,6' & 2,2',3,4,4',5,5',6-Octachlorobiphenyl (PCB 196 & 203) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	.793	0.071	9
		07-08	.667	0.151	6
		09-10	.650	0.099	7
	20-39	05-06	2.63	0.69	12
		07-08	2.15	0.14	15
		09-10	1.48	0.14	17
	40-59	05-06	8.33	0.94	12
		07-08	6.45	0.25	16
		09-10	5.79	0.63	17
60+	05-06	15.4	0.8	15	
	07-08	15.3	0.8	23	
	09-10	12.3	0.7	21	
Non-Hispanic White Female	12-19	05-06	.593	0.046	10
		07-08	*	*	7
		09-10	.459	0.071	8
	20-39	05-06	1.49	0.12	16
		07-08	1.72	0.21	13
		09-10	1.13	0.08	18
	40-59	05-06	5.23	0.24	13
		07-08	5.27	0.3	17
		09-10	4.80	0.36	17
	60+	05-06	12.6	1	17
		07-08	12.2	0.7	21
		09-10	11.3	0.9	22
Non-Hispanic Black Male	12-19	05-06	.937	0.103	13
		07-08	*	*	6
		09-10	.788	0.207	5
	20-39	05-06	2.34	0.22	6
		07-08	1.79	0.18	6
		09-10	2.21	0.34	5
	40-59	05-06	8.31	0.66	5
		07-08	8.17	0.91	6
		09-10	8.79	1.13	7
	60+	05-06	20.9	2.2	5
		07-08	19.8	2.3	8
		09-10	19.2	2.4	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,6' & 2,2',3,4,4',5,5',6-Octachlorobiphenyl (PCB 196 & 203) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.557	0.039	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	1.61	0.22	7
		07-08	1.40	0.21	8
		09-10	1.09	0.2	7
	40-59	05-06	7.01	0.65	7
		07-08	6.50	0.73	8
		09-10	5.81	1.06	7
60+	05-06	21.2	4.7	5	
	07-08	18.1	1.4	7	
	09-10	17.4	2.1	7	
Mexican American Male	12-19	05-06	.500	0.047	11
		07-08	.514	0.087	6
		09-10	.662	0.096	8
	20-39	05-06	1.16	0.1	9
		07-08	**1.97	0.7	9
		09-10	.946	0.138	8
	40-59	05-06	3.85	0.42	4
		07-08	4.71	0.62	6
		09-10	3.49	0.26	8
60+	05-06	9.56	2.38	4	
	07-08	10.6	1.8	5	
	09-10	10.6	0.7	5	
Mexican American Female	12-19	05-06	.464	0.05	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	.770	0.121	9
		07-08	1.02	0.04	8
		09-10	.765	0.085	10
	40-59	05-06	3.87	0.54	6
		07-08	4.02	0.61	6
		09-10	2.49	0.41	9
60+	05-06	7.87	0.44	3	
	07-08	7.87	1.56	5	
	09-10	8.01	1.18	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,6' & 2,2',3,4,4',5,5',6-Octachlorobiphenyl (PCB 196 & 203) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	.632	0.073	11
	20-39	09-10	1.07	0.12	12
	40-59	09-10	3.83	0.37	13
	60+	09-10	10.6	0.5	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	.809	0.071	14
	40-59	09-10	2.65	0.32	14
	60+	09-10	7.66	0.77	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,6' & 2,2',3,4,4',5,5',6-Octachlorobiphenyl (PCB 196 & 203) (whole weight) (2001 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	01-02	*	< LOD	< LOD	.100 (.090-.110)	.130 (.110-.140)	2299
	03-04	.016 (.015-.017)	.022 (.019-.025)	.044 (.042-.048)	.082 (.071-.087)	.101 (.091-.112)	1878
Age group 12-19 years	01-02	*	< LOD	< LOD	< LOD	< LOD	755
	03-04	.002 (<LOD-.003)	.003 (.002-.004)	.006 (.005-.007)	.013 (.009-.016)	.016 (.014-.025)	587
20 years and older	01-02	*	< LOD	< LOD	.100 (.090-.110)	.130 (.120-.150)	1544
	03-04	.021 (.020-.023)	.026 (.024-.028)	.049 (.045-.052)	.084 (.077-.090)	.104 (.092-.123)	1291
Gender Males	01-02	*	< LOD	< LOD	.100 (.090-.120)	.130 (.110-.150)	1071
	03-04	.017 (.015-.019)	.023 (.020-.026)	.045 (.042-.050)	.084 (.077-.091)	.106 (.093-.127)	935
Females	01-02	*	< LOD	< LOD	.090 (.080-.100)	.130 (.110-.140)	1228
	03-04	.015 (.014-.016)	.020 (.017-.023)	.043 (.038-.047)	.076 (.066-.084)	.093 (.085-.111)	943
Race/ethnicity Mexican Americans	01-02	*	< LOD	< LOD	< LOD	.070 (<LOD-.090)	565
	03-04	.006 (.004-.008)	.007 (.004-.010)	.017 (.011-.026)	.038 (.028-.054)	.058 (.035-.087)	424
Non-Hispanic blacks	01-02	*	< LOD	< LOD	.110 (.090-.140)	.150 (.110-.210)	513
	03-04	.014 (.012-.017)	.017 (.012-.022)	.046 (.038-.054)	.090 (.065-.111)	.141 (.094-.209)	453
Non-Hispanic whites	01-02	*	< LOD	< LOD	.100 (.090-.110)	.130 (.110-.140)	1058
	03-04	.019 (.017-.020)	.025 (.022-.028)	.048 (.043-.052)	.084 (.070-.090)	.100 (.090-.120)	882

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,6' & 2,2',3,4,4',5,5',6-Octachlorobiphenyl (PCB 196 & 203) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	.004	0	9
		07-08	.003	0.001	6
		09-10	3.49	0.58	7
	20-39	05-06	** .020	0.006	12
		07-08	.014	0.001	15
		09-10	9.80	1.09	17
	40-59	05-06	.063	0.008	12
		07-08	.047	0.002	16
		09-10	39.2	4.3	17
	60+	05-06	.104	0.004	15
		07-08	.098	0.005	23
		09-10	74.2	3.7	21
Non-Hispanic White Female	12-19	05-06	.003	0	10
		07-08	*	*	7
		09-10	2.22	0.37	8
	20-39	05-06	.010	0.001	16
		07-08	.010	0.001	13
		09-10	6.06	0.48	18
	40-59	05-06	.039	0.003	13
		07-08	.035	0.002	17
		09-10	30.2	2.3	17
	60+	05-06	.091	0.007	17
		07-08	.082	0.005	21
		09-10	68.3	4.9	22
Non-Hispanic Black Male	12-19	05-06	.005	0	13
		07-08	*	*	6
		09-10	3.51	0.95	5
	20-39	05-06	.014	0.001	6
		07-08	.010	0.001	6
		09-10	12.6	2.3	5
	40-59	05-06	.053	0.004	5
		07-08	.053	0.006	6
		09-10	53.2	5.3	7
	60+	05-06	.125	0.013	5
		07-08	.121	0.016	8
		09-10	103	14	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,6' & 2,2',3,4,4',5,5',6-Octachlorobiphenyl (PCB 196 & 203) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.003	0	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	.009	0.001	7
		07-08	.007	0.001	8
		09-10	5.45	1.06	7
	40-59	05-06	.045	0.004	7
		07-08	.039	0.005	8
		09-10	32.3	5.3	7
	60+	05-06	.140	0.031	5
07-08		.108	0.008	7	
09-10		99.8	12.1	7	
Mexican American Male	12-19	05-06	.003	0	11
		07-08	.003	0	6
		09-10	3.14	0.48	8
	20-39	05-06	.008	0.001	9
		07-08	** .013	0.005	9
		09-10	5.87	0.95	8
	40-59	05-06	.032	0.004	4
		07-08	.033	0.004	6
		09-10	24.3	2.6	8
	60+	05-06	.069	0.017	4
07-08		.075	0.011	5	
09-10		65.1	3.6	5	
Mexican American Female	12-19	05-06	.003	0	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	.005	0.001	9
		07-08	.006	0	8
		09-10	4.27	0.55	10
	40-59	05-06	.028	0.003	6
		07-08	.027	0.004	6
		09-10	16.4	3.2	9
	60+	05-06	.060	0.008	3
07-08		.054	0.011	5	
09-10		44.0	5.8	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,6' & 2,2',3,4,4',5,5',6-Octachlorobiphenyl (PCB 196 & 203) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	2.98	0.37	11
	20-39	09-10	7.07	1.17	12
	40-59	09-10	26.2	2.7	13
	60+	09-10	66.8	2.6	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	4.53	0.46	14
	40-59	09-10	16.8	2.3	14
	60+	09-10	45.0	4.1	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,5,5',6-Octachlorobiphenyl (PCB 199) (lipid adjusted) (2001 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	01-02	*	< LOD	< LOD	17.0 (15.4-18.1)	22.4 (19.9-25.9)	2292
	03-04	2.81 (2.64-3.00)	3.80 (3.26-4.26)	8.30 (7.70-9.08)	14.9 (13.8-15.7)	18.9 (17.9-21.3)	1861
Age group 12-19 years	01-02	*	< LOD	< LOD	< LOD	< LOD	756
	03-04	.416 (<LOD-.522)	.500 (<LOD-.700)	1.17 (.890-1.59)	2.43 (2.02-2.73)	3.92 (2.90-4.10)	579
20 years and older	01-02	*	< LOD	10.6 (<LOD-11.8)	17.9 (16.2-19.2)	24.4 (20.7-27.4)	1536
	03-04	3.71 (3.41-4.02)	4.60 (4.10-5.08)	9.40 (8.73-10.0)	15.7 (14.7-16.9)	20.6 (18.3-23.6)	1282
Gender Males	01-02	*	< LOD	< LOD	17.3 (15.4-18.7)	21.3 (19.3-24.6)	1066
	03-04	3.01 (2.68-3.39)	3.95 (3.30-4.67)	9.10 (7.60-9.94)	16.6 (14.0-17.3)	22.1 (18.1-27.4)	925
Females	01-02	*	< LOD	< LOD	16.2 (14.5-17.9)	22.9 (19.4-27.3)	1226
	03-04	2.63 (2.49-2.79)	3.70 (3.20-4.00)	7.70 (6.92-8.81)	14.0 (11.6-15.3)	17.0 (15.7-18.9)	936
Race/ethnicity Mexican Americans	01-02	*	< LOD	< LOD	< LOD	12.3 (<LOD-14.2)	565
	03-04	.943 (.664-1.34)	1.00 (.600-1.50)	3.35 (1.50-5.33)	7.37 (5.10-10.2)	10.2 (7.40-13.5)	418
Non-Hispanic blacks	01-02	*	< LOD	12.5 (<LOD-15.3)	21.9 (17.0-28.1)	30.7 (22.4-37.4)	513
	03-04	3.03 (2.46-3.74)	3.60 (2.70-4.70)	10.0 (7.70-13.7)	21.3 (15.9-30.4)	35.1 (21.3-43.3)	452
Non-Hispanic whites	01-02	*	< LOD	< LOD	17.3 (15.9-18.9)	22.7 (19.8-26.3)	1051
	03-04	3.24 (3.03-3.47)	4.19 (3.78-4.69)	9.08 (7.88-9.86)	14.8 (13.5-16.3)	18.6 (16.9-21.7)	871

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02 and 03-04 are 10.5 and 0.4.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,5,5',6-Octachlorobiphenyl (PCB 199) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	.629	0.101	9
		07-08	*	*	6
		09-10	.578	0.067	10
	20-39	05-06	2.45	0.63	12
		07-08	2.12	0.18	15
		09-10	1.36	0.14	16
	40-59	05-06	8.40	0.83	12
		07-08	6.73	0.4	16
		09-10	5.87	0.64	17
60+	05-06	17.5	1.1	15	
	07-08	16.9	1	23	
	09-10	13.1	0.7	21	
Non-Hispanic White Female	12-19	05-06	.540	0.058	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	1.37	0.12	16
		07-08	1.61	0.18	13
		09-10	1.09	0.08	18
	40-59	05-06	5.45	0.34	13
		07-08	5.27	0.38	17
		09-10	5.05	0.42	17
	60+	05-06	15.1	1.2	17
		07-08	14.7	0.9	21
		09-10	13.2	1.2	22
Non-Hispanic Black Male	12-19	05-06	.851	0.108	13
		07-08	*	*	6
		09-10	*	*	5
	20-39	05-06	2.43	0.32	6
		07-08	1.70	0.17	6
		09-10	1.74	0.24	5
	40-59	05-06	10.7	0.9	5
		07-08	9.25	1.05	6
		09-10	11.3	1.6	7
	60+	05-06	28.0	3.6	5
		07-08	24.6	2.9	8
		09-10	24.9	2.7	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,5,5',6-Octachlorobiphenyl (PCB 199) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.490	0.051	14
		07-08	*	*	5
		09-10	*	*	5
	20-39	05-06	1.59	0.24	7
		07-08	1.36	0.17	8
		09-10	1.21	0.29	6
	40-59	05-06	8.16	1.04	7
		07-08	6.94	0.87	8
		09-10	6.46	1.32	7
	60+	05-06	27.6	6	5
07-08		22.0	1.8	7	
09-10		21.8	2.5	7	
Mexican American Male	12-19	05-06	.395	0.045	11
		07-08	*	*	6
		09-10	.643	0.107	8
	20-39	05-06	1.03	0.11	9
		07-08	**1.92	0.79	9
		09-10	.848	0.114	7
	40-59	05-06	4.23	0.49	4
		07-08	5.47	0.92	6
		09-10	3.64	0.29	8
	60+	05-06	10.1	2.6	4
07-08		11.4	1.6	5	
09-10		11.9	1	5	
Mexican American Female	12-19	05-06	.386	0.052	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	.634	0.11	9
		07-08	.843	0.031	8
		09-10	.609	0.079	9
	40-59	05-06	3.67	0.52	6
		07-08	4.09	0.69	6
		09-10	2.58	0.43	9
	60+	05-06	8.79	0.55	3
07-08		8.71	1.93	5	
09-10		8.93	1.52	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,5,5',6-Octachlorobiphenyl (PCB 199) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	.584	0.083	11
	20-39	09-10	1.00	0.1	12
	40-59	09-10	4.16	0.45	13
	60+	09-10	12.6	0.8	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	.694	0.081	13
	40-59	09-10	2.78	0.34	14
	60+	09-10	8.71	0.98	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,5,5',6-Octachlorobiphenyl (PCB 199) (whole weight) (2001 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	01-02	*	< LOD	< LOD	.110 (.100-.130)	.150 (.140-.170)	2292
	03-04	.017 (.016-.018)	.023 (.020-.027)	.056 (.053-.060)	.100 (.091-.106)	.127 (.119-.144)	1861
Age group 12-19 years	01-02	*	< LOD	< LOD	< LOD	< LOD	756
	03-04	.002 (<LOD-.003)	.002 (<LOD-.003)	.006 (.005-.008)	.012 (.009-.015)	.016 (.015-.019)	579
20 years and older	01-02	*	< LOD	.070 (<LOD-.080)	.120 (.110-.140)	.160 (.140-.180)	1536
	03-04	.023 (.021-.025)	.029 (.026-.033)	.062 (.058-.067)	.106 (.097-.113)	.135 (.120-.158)	1282
Gender Males	01-02	*	< LOD	< LOD	.110 (.100-.130)	.150 (.130-.180)	1066
	03-04	.019 (.016-.021)	.025 (.020-.030)	.059 (.053-.068)	.105 (.090-.113)	.138 (.120-.162)	925
Females	01-02	*	< LOD	< LOD	.110 (.100-.130)	.150 (.130-.170)	1226
	03-04	.016 (.015-.017)	.022 (.019-.025)	.054 (.047-.058)	.094 (.085-.105)	.120 (.108-.133)	936
Race/ethnicity Mexican Americans	01-02	*	< LOD	< LOD	< LOD	.090 (<LOD-.110)	565
	03-04	.006 (.004-.008)	.007 (.004-.010)	.019 (.011-.031)	.051 (.029-.079)	.079 (.051-.093)	418
Non-Hispanic blacks	01-02	*	< LOD	.070 (<LOD-.090)	.140 (.100-.180)	.190 (.130-.300)	513
	03-04	.017 (.014-.021)	.021 (.015-.026)	.064 (.054-.073)	.135 (.102-.173)	.207 (.147-.297)	452
Non-Hispanic whites	01-02	*	< LOD	< LOD	.120 (.100-.130)	.150 (.130-.180)	1051
	03-04	.020 (.019-.022)	.027 (.023-.030)	.059 (.054-.065)	.101 (.087-.108)	.125 (.108-.144)	871

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,5,5',6-Octachlorobiphenyl (PCB 199) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	.003	0.001	9
		07-08	*	*	6
		09-10	3.09	0.38	10
	20-39	05-06	.019	0.006	12
		07-08	.014	0.001	15
		09-10	9.08	1.03	16
	40-59	05-06	.063	0.005	12
		07-08	.049	0.003	16
		09-10	39.7	4.3	17
60+	05-06	.118	0.006	15	
	07-08	.109	0.006	23	
	09-10	78.8	3.9	21	
Non-Hispanic White Female	12-19	05-06	.003	0	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	.009	0.001	16
		07-08	.010	0.001	13
		09-10	5.83	0.48	18
	40-59	05-06	.041	0.004	13
		07-08	.035	0.003	17
		09-10	31.9	2.7	17
	60+	05-06	.110	0.009	17
		07-08	.099	0.006	21
		09-10	79.9	6.5	22
Non-Hispanic Black Male	12-19	05-06	.004	0.001	13
		07-08	*	*	6
		09-10	*	*	5
	20-39	05-06	.014	0.002	6
		07-08	.010	0.001	6
		09-10	9.47	1.11	5
	40-59	05-06	.069	0.006	5
		07-08	.059	0.007	6
		09-10	68.4	7.5	7
	60+	05-06	.168	0.024	5
		07-08	.150	0.02	8
		09-10	134	15	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,5,5',6-Octachlorobiphenyl (PCB 199) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.002	0	14
		07-08	*	*	5
		09-10	*	*	5
	20-39	05-06	.009	0.001	7
		07-08	.007	0.001	8
		09-10	6.08	1.51	6
	40-59	05-06	.052	0.006	7
		07-08	.042	0.006	8
		09-10	35.8	6.6	7
	60+	05-06	.183	0.039	5
07-08		.132	0.011	7	
09-10		125	14	7	
Mexican American Male	12-19	05-06	.002	0	11
		07-08	*	*	6
		09-10	3.05	0.52	8
	20-39	05-06	.007	0.001	9
		07-08	** .013	0.005	9
		09-10	5.31	0.82	7
	40-59	05-06	.035	0.005	4
		07-08	.038	0.006	6
		09-10	25.3	2.7	8
	60+	05-06	.073	0.02	4
07-08		.081	0.009	5	
09-10		73.4	5.5	5	
Mexican American Female	12-19	05-06	.002	0	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	.004	0.001	9
		07-08	.005	0	8
		09-10	3.39	0.52	9
	40-59	05-06	.027	0.003	6
		07-08	.028	0.004	6
		09-10	16.9	3.2	9
	60+	05-06	.068	0.01	3
07-08		.060	0.014	5	
09-10		48.9	7.7	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,5,5',6-Octachlorobiphenyl (PCB 199) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	2.75	0.41	11
	20-39	09-10	6.61	0.95	12
	40-59	09-10	28.5	3.2	13
	60+	09-10	79.3	5	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	3.89	0.52	13
	40-59	09-10	17.6	2.4	14
	60+	09-10	51.2	5.5	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (PCB 206) (lipid adjusted) (2001 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	01-02	*	< LOD	< LOD	< LOD	< LOD	2208
	03-04	2.13 (1.97-2.31)	2.34 (2.00-2.60)	5.00 (4.69-5.50)	9.20 (8.55-9.79)	13.7 (11.5-15.6)	1867
Age group 12-19 years	01-02	*	< LOD	< LOD	< LOD	< LOD	723
	03-04	*	< LOD	.900 (.750-1.20)	1.75 (1.23-2.92)	3.12 (1.60-6.91)	585
20 years and older	01-02	*	< LOD	< LOD	< LOD	< LOD	1485
	03-04	2.59 (2.37-2.83)	2.80 (2.42-3.06)	5.53 (5.10-6.10)	9.61 (9.03-11.0)	14.2 (12.2-17.1)	1282
Gender Males	01-02	*	< LOD	< LOD	< LOD	< LOD	1033
	03-04	2.23 (2.03-2.45)	2.30 (1.90-2.70)	5.10 (4.78-5.53)	9.31 (8.18-10.8)	13.8 (10.8-15.7)	933
Females	01-02	*	< LOD	< LOD	< LOD	< LOD	1175
	03-04	2.05 (1.86-2.25)	2.34 (1.95-2.78)	5.00 (4.30-5.70)	9.00 (8.00-9.79)	13.6 (11.2-16.5)	934
Race/ethnicity Mexican Americans	01-02	*	< LOD	< LOD	< LOD	< LOD	533
	03-04	.861 (<LOD-1.15)	.730 (<LOD-1.10)	1.70 (1.00-3.14)	4.40 (2.61-6.20)	6.20 (4.40-8.40)	421
Non-Hispanic blacks	01-02	*	< LOD	< LOD	< LOD	< LOD	483
	03-04	2.27 (1.98-2.60)	2.26 (1.85-2.51)	5.60 (4.30-7.40)	11.5 (9.49-16.5)	20.9 (12.1-31.7)	456
Non-Hispanic whites	01-02	*	< LOD	< LOD	< LOD	< LOD	1034
	03-04	2.40 (2.19-2.63)	2.70 (2.37-3.01)	5.37 (4.88-6.06)	9.20 (8.65-10.1)	13.8 (11.2-16.6)	872

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02 and 03-04 are 28.1 and 0.7.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (PCB 206) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	.392	0.038	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	1.24	0.26	12
		07-08	1.19	0.09	15
		09-10	.833	0.054	17
	40-59	05-06	3.97	0.23	12
		07-08	3.46	0.26	16
		09-10	2.79	0.25	17
60+	05-06	10.3	0.7	15	
	07-08	8.72	0.48	23	
	09-10	7.40	0.49	21	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	.486	0.089	7
		09-10	*	*	8
	20-39	05-06	.778	0.066	16
		07-08	.970	0.116	13
		09-10	.645	0.041	19
	40-59	05-06	2.94	0.22	13
		07-08	2.93	0.21	17
		09-10	2.68	0.17	17
60+	05-06	11.2	1.3	17	
	07-08	9.65	0.75	21	
	09-10	8.60	0.91	22	
Non-Hispanic Black Male	12-19	05-06	.519	0.052	13
		07-08	.427	0.112	6
		09-10	.603	0.068	6
	20-39	05-06	1.27	0.13	6
		07-08	1.10	0.13	6
		09-10	.907	0.113	7
	40-59	05-06	6.34	0.29	5
		07-08	4.69	0.43	6
		09-10	6.39	1.41	7
60+	05-06	17.8	3.2	5	
	07-08	13.7	1.7	8	
	09-10	14.3	1.5	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (PCB 206) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.333	0.028	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	.953	0.119	7
		07-08	.861	0.122	8
		09-10	.933	0.181	7
	40-59	05-06	4.56	0.47	7
		07-08	3.75	0.52	8
		09-10	3.73	0.87	7
	60+	05-06	21.1	4.7	5
		07-08	14.9	1.7	7
		09-10	13.9	1.9	7
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	.528	0.046	9
		07-08	**1.32	0.61	9
		09-10	.611	0.081	8
	40-59	05-06	2.01	0.24	4
		07-08	2.47	0.34	6
		09-10	1.88	0.11	8
	60+	05-06	5.50	1.47	4
		07-08	5.60	0.7	5
		09-10	6.03	0.57	5
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	.351	0.047	9
		07-08	.509	0.087	8
		09-10	.443	0.036	10
	40-59	05-06	1.91	0.28	6
		07-08	2.01	0.29	6
		09-10	1.49	0.24	9
	60+	05-06	5.76	0.27	3
		07-08	5.10	1.24	5
		09-10	5.56	1.15	6

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (PCB 206) (lipid adjusted) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	.650	0.055	13
	40-59	09-10	2.07	0.15	13
	60+	09-10	6.91	0.7	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	.500	0.038	14
	40-59	09-10	1.50	0.16	14
	60+	09-10	5.64	0.75	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.31, 0.3, and 0.44, respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (PCB 206) (whole weight) (2001 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	01-02	*	< LOD	< LOD	< LOD	< LOD	2208
	03-04	.013 (.012-.014)	.015 (.012-.017)	.034 (.031-.037)	.060 (.054-.068)	.086 (.077-.104)	1867
Age group 12-19 years	01-02	*	< LOD	< LOD	< LOD	< LOD	723
	03-04	*	< LOD	.005 (.004-.006)	.010 (.006-.013)	.014 (.008-.035)	585
20 years and older	01-02	*	< LOD	< LOD	< LOD	< LOD	1485
	03-04	.016 (.015-.018)	.017 (.016-.020)	.038 (.034-.042)	.066 (.059-.074)	.090 (.081-.112)	1282
Gender Males	01-02	*	< LOD	< LOD	< LOD	< LOD	1033
	03-04	.014 (.012-.015)	.015 (.012-.018)	.034 (.032-.038)	.060 (.051-.070)	.082 (.070-.097)	933
Females	01-02	*	< LOD	< LOD	< LOD	< LOD	1175
	03-04	.012 (.011-.014)	.014 (.012-.016)	.035 (.029-.038)	.061 (.054-.069)	.088 (.078-.118)	934
Race/ethnicity Mexican Americans	01-02	*	< LOD	< LOD	< LOD	< LOD	533
	03-04	.005 (<LOD-.007)	.005 (<LOD-.007)	.011 (.008-.018)	.031 (.019-.044)	.044 (.030-.062)	421
Non-Hispanic blacks	01-02	*	< LOD	< LOD	< LOD	< LOD	483
	03-04	.013 (.011-.015)	.012 (.010-.014)	.035 (.028-.045)	.078 (.052-.107)	.128 (.080-.213)	456
Non-Hispanic whites	01-02	*	< LOD	< LOD	< LOD	< LOD	1034
	03-04	.015 (.013-.016)	.017 (.015-.020)	.036 (.033-.040)	.063 (.058-.069)	.088 (.077-.107)	872

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (PCB 206) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	.002	0	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	.009	0.002	12
		07-08	.008	0.001	15
		09-10	5.47	0.42	17
	40-59	05-06	.030	0.002	12
		07-08	.025	0.002	16
		09-10	18.9	1.6	17
60+	05-06	.070	0.004	15	
	07-08	.056	0.003	23	
	09-10	44.6	2.6	21	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	.002	0	7
		09-10	*	*	8
	20-39	05-06	.005	0	16
		07-08	.006	0.001	13
		09-10	3.46	0.26	19
	40-59	05-06	.022	0.002	13
		07-08	.019	0.001	17
		09-10	17.0	1.2	17
60+	05-06	.081	0.009	17	
	07-08	.065	0.005	21	
	09-10	51.5	5.1	22	
Non-Hispanic Black Male	12-19	05-06	.003	0	13
		07-08	.002	0	6
		09-10	2.80	0.41	6
	20-39	05-06	.007	0.001	6
		07-08	.006	0.001	6
		09-10	5.17	0.68	7
	40-59	05-06	.040	0.003	5
		07-08	.030	0.003	6
		09-10	37.8	7	7
60+	05-06	.107	0.02	5	
	07-08	.084	0.012	8	
	09-10	76.6	8.5	9	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (PCB 206) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	.002	0	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	.005	0.001	7
		07-08	.004	0.001	8
		09-10	4.66	0.94	7
	40-59	05-06	.029	0.003	7
		07-08	.023	0.004	8
		09-10	20.6	4.3	7
	60+	05-06	.140	0.03	5
07-08		.090	0.01	7	
09-10		78.8	10.2	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	.004	0	9
		07-08	** .009	0.004	9
		09-10	3.77	0.56	8
	40-59	05-06	.016	0.002	4
		07-08	.017	0.002	6
		09-10	13.0	1.1	8
	60+	05-06	.040	0.012	4
07-08		.040	0.004	5	
09-10		37.0	3.3	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	.002	0	9
		07-08	.003	0	8
		09-10	2.46	0.25	10
	40-59	05-06	.014	0.002	6
		07-08	.014	0.002	6
		09-10	9.64	1.73	9
	60+	05-06	.044	0.005	3
07-08		.035	0.009	5	
09-10		30.3	5.9	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (PCB 206) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	4.22	0.51	13
	40-59	09-10	14.1	1.2	13
	60+	09-10	44.4	6.1	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	2.79	0.25	14
	40-59	09-10	9.44	1.16	14
	60+	09-10	33.2	4.3	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl (PCB 209) (lipid adjusted) (2003 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of lipid or parts per billion on a lipid-weight basis) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	03-04	1.40 (1.21-1.61)	1.18 (1.00-1.48)	3.20 (2.67-4.01)	7.58 (6.20-8.81)	11.1 (9.00-15.7)	1854
Age group							
12-19 years	03-04	*	< LOD	< LOD	1.12 (.800-4.60)	3.49 (1.12-6.64)	578
20 years and older	03-04	1.63 (1.42-1.88)	1.40 (1.18-1.70)	3.80 (3.04-4.44)	8.09 (6.60-9.30)	12.3 (9.05-18.0)	1276
Gender							
Males	03-04	1.37 (1.18-1.60)	1.15 (1.00-1.50)	3.00 (2.70-3.58)	6.22 (4.97-8.20)	9.10 (7.09-13.0)	925
Females	03-04	1.42 (1.22-1.66)	1.20 (1.00-1.50)	3.46 (2.45-4.61)	8.78 (7.45-9.47)	13.9 (10.0-18.7)	929
Race/ethnicity							
Mexican Americans	03-04	*	< LOD	1.10 (.770-1.60)	2.40 (1.60-3.60)	3.71 (2.40-4.97)	416
Non-Hispanic blacks	03-04	1.56 (1.37-1.78)	1.35 (1.10-1.52)	3.40 (2.62-4.82)	9.83 (6.70-13.6)	18.0 (11.8-27.7)	455
Non-Hispanic whites	03-04	1.53 (1.31-1.79)	1.30 (1.09-1.70)	3.89 (3.04-4.50)	7.95 (6.49-9.09)	11.3 (9.07-16.3)	864

Limit of detection (LOD, see Data Analysis section) for Survey year 03-04 is 0.7.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl (PCB 209) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
		09-10	*	*	10
	20-39	05-06	.005	0.001	12
		07-08	.004	0.001	15
		09-10	*	*	17
	40-59	05-06	.013	0.001	12
		07-08	.014	0.001	16
		09-10	10.5	1	17
60+	05-06	.048	0.004	15	
	07-08	.045	0.004	23	
	09-10	34.1	2.9	21	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
		09-10	*	*	8
	20-39	05-06	.002	0	16
		07-08	.003	0	13
		09-10	*	*	19
	40-59	05-06	.010	0.001	13
		07-08	.011	0.001	17
		09-10	8.14	0.64	17
	60+	05-06	.080	0.01	17
		07-08	.074	0.008	21
		09-10	50.2	6.6	22
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
		09-10	*	*	6
	20-39	05-06	.005	0.001	6
		07-08	.003	0	6
		09-10	3.59	0.67	7
	40-59	05-06	.026	0.003	5
		07-08	.017	0.003	6
		09-10	22.5	4.3	7
	60+	05-06	.089	0.017	5
		07-08	.082	0.013	8
		09-10	68.9	9.9	9

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl (PCB 209) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
		09-10	*	*	6
	20-39	05-06	.003	0.001	7
		07-08	*	*	8
		09-10	*	*	7
	40-59	05-06	.018	0.002	7
		07-08	.014	0.003	8
		09-10	**18.0	7.2	7
	60+	05-06	.142	0.03	5
07-08		.096	0.015	7	
09-10		81.0	17.4	7	
Mexican American Male	12-19	05-06	*	*	11
		07-08	*	*	6
		09-10	*	*	8
	20-39	05-06	.002	0	9
		07-08	.002	0.001	9
		09-10	*	*	8
	40-59	05-06	.007	0.001	4
		07-08	.008	0.001	6
		09-10	7.52	0.7	8
	60+	05-06	**0.030	0.014	4
07-08		.031	0.004	5	
09-10		27.2	5.3	5	
Mexican American Female	12-19	05-06	*	*	16
		07-08	*	*	5
		09-10	*	*	7
	20-39	05-06	*	*	9
		07-08	*	*	8
		09-10	*	*	10
	40-59	05-06	.007	0.001	6
		07-08	.010	0.003	6
		09-10	4.66	0.84	8
	60+	05-06	.038	0.002	3
07-08		**0.033	0.01	5	
09-10		31.0	7.9	6	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl (PCB 209) (whole weight) (2005 – 2010)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
All Hispanic Male	12-19	09-10	*	*	11
	20-39	09-10	*	*	13
	40-59	09-10	8.18	0.7	13
	60+	09-10	36.4	9	8
All Hispanic Female	12-19	09-10	*	*	10
	20-39	09-10	*	*	14
	40-59	09-10	4.63	0.56	13
	60+	09-10	36.2	6	11

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

** Standard error of the mean estimate is > 30%.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl (PCB 209) (whole weight) (2003 – 2004)

Geometric mean and selected percentiles of serum concentrations (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the following page for data from later NHANES Survey periods.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Total	03-04	.009 (.007-.010)	.008 (.006-.009)	.021 (.017-.026)	.049 (.040-.058)	.073 (.059-.097)	1854
Age group							
12-19 years	03-04	*	< LOD	< LOD	.006 (.004-.018)	.017 (.005-.033)	578
20 years and older	03-04	.010 (.009-.012)	.009 (.008-.011)	.024 (.020-.028)	.053 (.044-.063)	.077 (.065-.105)	1276
Gender							
Males	03-04	.008 (.007-.010)	.008 (.006-.010)	.019 (.017-.023)	.039 (.032-.051)	.063 (.042-.077)	925
Females	03-04	.009 (.007-.010)	.008 (.006-.009)	.024 (.016-.032)	.057 (.049-.064)	.092 (.068-.134)	929
Race/ethnicity							
Mexican Americans	03-04	*	< LOD	.007 (.005-.010)	.018 (.010-.023)	.024 (.018-.035)	416
Non-Hispanic blacks	03-04	.009 (.008-.010)	.008 (.006-.009)	.022 (.018-.027)	.065 (.039-.077)	.097 (.065-.144)	455
Non-Hispanic whites	03-04	.009 (.008-.011)	.009 (.007-.011)	.024 (.020-.029)	.053 (.044-.061)	.076 (.063-.099)	864

< LOD means less than the limit of detection for the lipid adjusted serum level, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl (PCB 209) (whole weight)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey. See the previous page for data from earlier NHANES Survey periods.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡
Non-Hispanic White Male	12-19	05-06	*	*	9
		07-08	*	*	6
	20-39	05-06	.005	0.001	12
		07-08	.004	0.001	15
	40-59	05-06	.013	0.001	12
		07-08	.014	0.001	16
60+	05-06	.048	0.004	15	
	07-08	.045	0.004	23	
Non-Hispanic White Female	12-19	05-06	*	*	10
		07-08	*	*	7
	20-39	05-06	.002	0	16
		07-08	.003	0	13
	40-59	05-06	.010	0.001	13
		07-08	.011	0.001	17
60+	05-06	.080	0.01	17	
	07-08	.074	0.008	21	
Non-Hispanic Black Male	12-19	05-06	*	*	13
		07-08	*	*	6
	20-39	05-06	.005	0.001	6
		07-08	.003	0	6
	40-59	05-06	.026	0.003	5
		07-08	.017	0.003	6
60+	05-06	.089	0.017	5	
	07-08	.082	0.013	8	
Non-Hispanic Black Female	12-19	05-06	*	*	14
		07-08	*	*	5
	20-39	05-06	.003	0.001	7
		07-08	*	*	8
	40-59	05-06	.018	0.002	7
		07-08	.014	0.003	8
60+	05-06	.142	0.03	5	
	07-08	.096	0.015	7	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not reported: proportion of results below limit of detection was too high to provide a valid result or standard error >30% of mean.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Serum 2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl (PCB 209) (whole weight)

Weighted arithmetic mean and unadjusted standard error of pooled serum concentrations† (in ng/g of serum or parts per billion) for the U.S. population from the National Health and Nutrition Examination Survey.

Category	Age (years)	Survey years	Weighted arithmetic mean	Unadjusted standard error	Number of pools ‡	
Mexican American Male	12-19	05-06	*	*	11	
		07-08	*	*	6	
	20-39	05-06	.002	0	9	
		07-08	.002	0.001	9	
	40-59	05-06	.007	0.001	4	
		07-08	.008	0.001	6	
	60+	05-06	*	*	4	
		07-08	.031	0.004	5	
	Mexican American Female	12-19	05-06	*	*	16
			07-08	*	*	5
20-39		05-06	*	*	9	
		07-08	*	*	8	
40-59		05-06	.007	0.001	6	
		07-08	.010	0.003	6	
60+		05-06	.038	0.002	3	
		07-08	*	*	5	

†See [Special Analysis of Pooled Samples for Select Chemicals](#) for additional explanation.

‡ Each pool was composed of serum from 8 persons.

Weighted arithmetic means are not comparable to weighted geometric means.

Unadjusted standard errors do not incorporate survey design effects.

* Not reported: proportion of results below limit of detection was too high to provide a valid result or standard error >30% of mean.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/NDL-PCBs_BiomonitoringSummary.html

Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample

Background

The Family Smoking Prevention and Tobacco Control Act of 2009 gave the Food and Drug Administration regulatory authority over tobacco products. In Section 907(a), the Act states that the Secretary of Health and Human Services shall establish tobacco product standards. These product standards will include provisions for the testing of tobacco products. To determine the effectiveness of these product standards, surveillance systems need to be in place before the standards are enacted to determine their impact on exposure among people who continue to use tobacco products. NHANES is an ideal source of human samples for assessing smokers in multiple locations around the country. NHANES will provide a robust dataset for identifying changes in exposure of smokers that follow enactment of tobacco product standards.

Special Sample in NHANES

Beginning with NHANES 2011-2012, a Special Sample was selected for measurement of certain groups of chemicals associated with tobacco smoke exposure. The Special Sample consists of: 1) a nationally representative sample of adults; and 2) all adults who reported being current cigarette smokers. For this sample, adults were defined as ages 20 years and older in 2011-2012 and 18 years and older beginning in 2013.

Cigarette smokers were defined by their responses to the Smoking-Cigarette Use (SMQ_G) questionnaire: "Have you smoked at least 100 cigarettes in your life?" (SMQ020=1), and then, confirmed that they smoke every day (SMQ040=1) or some days (SMQ040=2). The nonsmoker category was comprised of the remaining adults in the Special Sample who were not categorized as smokers of any tobacco products. Excluded from the nonsmoker category was any adult who reported that they used any of the following non-cigarette tobacco products: cigars; pipes; chewing tobacco; snuff; or nicotine patch, gum or other replacement product. This resulted in exclusion of 3.54% (weighted) from the total sample for NHANES 2011-2012 and 4.85% (weighted) in NHANES 2013-2014. Too few adults reported use of non-cigarette tobacco products to allow separate categories for these products. We did not use serum cotinine concentrations to distinguish between smokers and nonsmokers because not all adults in the sample had results: for example, 4.17% (weighted) of the 2011-2012 sample were missing serum cotinine results.

Results are displayed separately for adult cigarette smokers and nonsmokers. Each data table shows geometric mean and selected percentiles by three categories: total; age group (20-49 or 18-49 years, 50 years and older); and sex (male, female). Racial/ethnic categories are not presented because the sample sizes were too small in one or more of the categories. Future *Updated Tables* will present data tables for additional chemical groups that were measured in the Special Sample.

Urinary Antimony (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	.061 (.052-.071)	.056 (.043-.071)	.098 (.080-.117)	.168 (.137-.184)	.233 (.173-.306)	876
	13-14	.052 (.048-.058)	.051 (.045-.056)	.094 (.084-.103)	.164 (.139-.183)	.225 (.186-.261)	957
Age group							
20-49 years	11-12	.066 (.057-.075)	.062 (.051-.073)	.109 (.085-.125)	.170 (.140-.184)	.236 (.180-.301)	522
18-49 years	13-14	.054 (.049-.060)	.054 (.048-.058)	.097 (.086-.111)	.166 (.136-.189)	.223 (.182-.271)	583
50 years and older	11-12	*	.046 (<LOD-.065)	.089 (.059-.114)	.153 (.110-.233)	.233 (.137-.406)	354
	13-14	.049 (.042-.057)	.044 (.040-.055)	.085 (.068-.099)	.160 (.127-.186)	.227 (.167-.485)	374
Gender							
Males	11-12	.065 (.054-.078)	.059 (.043-.079)	.110 (.084-.142)	.170 (.142-.200)	.243 (.177-.329)	527
	13-14	.057 (.052-.062)	.056 (.050-.061)	.097 (.080-.118)	.178 (.132-.210)	.227 (.182-.270)	512
Females	11-12	.056 (.048-.066)	.052 (<LOD-.066)	.081 (.069-.109)	.141 (.109-.206)	.207 (.129-.429)	349
	13-14	.049 (.042-.056)	.044 (.037-.055)	.092 (.074-.106)	.153 (.130-.183)	.204 (.178-.309)	445
Nonsmokers†							
Total	11-12	*	.042 (<LOD-.047)	.072 (.062-.081)	.122 (.108-.135)	.159 (.149-.199)	1343
	13-14	.040 (.036-.044)	.037 (.031-.043)	.069 (.063-.074)	.116 (.103-.134)	.168 (.146-.210)	1487
Age group							
20-49 years	11-12	*	.045 (<LOD-.053)	.078 (.065-.091)	.137 (.118-.153)	.194 (.149-.309)	671
18-49 years	13-14	.042 (.037-.047)	.040 (.032-.046)	.072 (.065-.086)	.131 (.113-.146)	.181 (.153-.228)	778
50 years and older	11-12	*	< LOD	.064 (.055-.074)	.103 (.092-.122)	.149 (.118-.224)	672
	13-14	.038 (.034-.042)	.036 (.028-.042)	.064 (.057-.069)	.099 (.093-.108)	.158 (.110-.195)	709
Gender							
Males	11-12	*	.046 (<LOD-.053)	.080 (.066-.091)	.133 (.103-.158)	.179 (.152-.273)	635
	13-14	.046 (.041-.051)	.043 (.038-.050)	.078 (.068-.092)	.144 (.121-.164)	.213 (.159-.278)	663
Females	11-12	*	< LOD	.064 (.057-.074)	.116 (.095-.131)	.159 (.131-.194)	708
	13-14	.036 (.032-.040)	.032 (.027-.040)	.062 (.051-.070)	.097 (.088-.112)	.136 (.116-.162)	824

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.041 and 0.022, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Antimony_BiomonitoringSummary.html

Urinary Antimony (creatinine corrected) (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	.067 (.062-.073)	.064 (.056-.071)	.100 (.091-.110)	.171 (.138-.200)	.242 (.181-.279)	876
	13-14	.054 (.048-.060)	.051 (.044-.058)	.076 (.067-.090)	.114 (.096-.145)	.164 (.133-.223)	956
Age group							
20-49 years	11-12	.068 (.063-.074)	.066 (.059-.073)	.101 (.092-.110)	.171 (.124-.207)	.242 (.171-.291)	522
18-49 years	13-14	.051 (.045-.057)	.047 (.042-.057)	.071 (.063-.085)	.100 (.090-.122)	.133 (.100-.181)	582
50 years and older	11-12	*	.059 (<LOD-.071)	.096 (.074-.137)	.171 (.134-.215)	.242 (.171-.344)	354
	13-14	.060 (.054-.067)	.057 (.053-.061)	.085 (.070-.108)	.164 (.119-.239)	.255 (.148-.429)	374
Gender							
Males	11-12	.061 (.057-.066)	.056 (.051-.064)	.091 (.075-.101)	.164 (.122-.214)	.256 (.166-.282)	527
	13-14	.050 (.046-.055)	.047 (.044-.049)	.068 (.060-.080)	.103 (.089-.123)	.133 (.109-.200)	511
Females	11-12	.075 (.067-.085)	.073 (<LOD-.086)	.110 (.094-.138)	.175 (.141-.207)	.210 (.158-.344)	349
	13-14	.057 (.049-.067)	.057 (.045-.066)	.085 (.070-.097)	.133 (.096-.221)	.221 (.145-.309)	445
Nonsmokers†							
Total	11-12	*	.056 (<LOD-.060)	.088 (.076-.101)	.153 (.127-.171)	.215 (.179-.240)	1342
	13-14	.048 (.043-.052)	.045 (.042-.048)	.069 (.063-.075)	.104 (.094-.117)	.151 (.127-.172)	1486
Age group							
20-49 years	11-12	*	.055 (<LOD-.060)	.088 (.072-.107)	.161 (.126-.214)	.224 (.179-.297)	670
18-49 years	13-14	.046 (.042-.050)	.043 (.039-.048)	.064 (.059-.070)	.100 (.089-.113)	.155 (.133-.173)	778
50 years and older	11-12	*	< LOD	.088 (.076-.103)	.135 (.121-.155)	.183 (.152-.224)	672
	13-14	.050 (.045-.056)	.047 (.044-.051)	.073 (.066-.084)	.109 (.096-.127)	.147 (.122-.178)	708
Gender							
Males	11-12	*	.047 (<LOD-.049)	.069 (.062-.076)	.118 (.100-.128)	.170 (.125-.224)	634
	13-14	.044 (.040-.049)	.041 (.037-.046)	.059 (.052-.068)	.100 (.086-.122)	.162 (.114-.229)	662
Females	11-12	*	< LOD	.104 (.088-.116)	.171 (.143-.207)	.224 (.181-.284)	708
	13-14	.051 (.046-.055)	.048 (.045-.052)	.075 (.069-.081)	.109 (.097-.122)	.147 (.123-.167)	824

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Antimony_BiomonitoringSummary.html

Urinary Total Arsenic (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg As/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	6.08 (4.78-7.73)	5.38 (3.98-6.74)	12.0 (8.59-18.2)	31.8 (20.8-43.3)	48.4 (33.2-112)	876
	13-14	6.04 (5.08-7.17)	5.85 (4.91-7.10)	11.4 (9.83-13.6)	22.7 (18.2-29.1)	40.2 (27.9-64.7)	976
Age group							
20-49 years	11-12	6.15 (4.86-7.79)	5.70 (3.96-7.23)	12.0 (8.59-18.5)	26.8 (20.3-38.7)	43.3 (32.0-82.1)	522
18-49 years	13-14	6.34 (5.15-7.80)	6.15 (5.09-7.91)	11.7 (9.88-14.6)	23.9 (17.7-30.7)	40.2 (27.9-63.0)	591
50 years and older	11-12	5.97 (4.28-8.31)	4.69 (3.68-6.86)	12.2 (6.86-21.1)	35.9 (15.1-121)	80.5 (29.0-144)	354
	13-14	5.45 (4.72-6.28)	5.28 (4.41-6.10)	10.6 (8.07-12.4)	20.4 (15.5-34.2)	39.3 (23.9-108)	385
Gender							
Males	11-12	6.65 (5.05-8.74)	5.71 (4.33-8.55)	14.8 (9.40-19.9)	33.2 (22.3-44.1)	44.1 (37.7-94.5)	527
	13-14	6.95 (5.65-8.55)	6.86 (5.82-7.91)	12.7 (10.4-15.2)	27.9 (15.3-51.7)	55.5 (24.4-99.0)	524
Females	11-12	5.43 (4.40-6.71)	4.69 (3.38-5.95)	9.67 (6.86-15.0)	30.5 (15.7-48.4)	62.1 (22.4-209)	349
	13-14	5.21 (4.26-6.38)	5.09 (4.02-6.15)	10.2 (7.44-14.2)	18.9 (16.5-25.4)	31.0 (23.9-40.2)	452
Nonsmokers†							
Total	11-12	7.34 (6.27-8.60)	6.66 (5.39-8.11)	13.7 (11.4-18.6)	34.2 (25.9-41.9)	55.8 (41.5-82.2)	1343
	13-14	6.54 (5.66-7.56)	6.13 (5.02-7.32)	12.5 (10.8-14.5)	29.3 (24.7-33.6)	48.5 (38.2-56.6)	1549
Age group							
20-49 years	11-12	7.37 (6.29-8.65)	6.79 (5.42-7.99)	13.3 (11.2-18.6)	35.7 (26.3-43.9)	56.4 (45.9-89.5)	671
18-49 years	13-14	6.35 (5.59-7.22)	5.94 (5.43-6.76)	11.5 (9.99-13.4)	24.9 (20.2-30.5)	42.8 (30.2-58.3)	821
50 years and older	11-12	7.31 (5.97-8.96)	6.57 (5.22-8.57)	14.4 (10.7-20.5)	34.2 (21.1-50.6)	55.8 (35.8-82.8)	672
	13-14	6.77 (5.45-8.42)	6.31 (4.28-9.08)	13.7 (10.8-19.1)	36.0 (23.8-45.6)	52.2 (39.5-68.0)	728
Gender							
Males	11-12	8.18 (6.66-10.0)	7.41 (5.62-9.98)	15.8 (11.8-21.0)	36.5 (26.3-42.7)	56.0 (39.0-82.8)	635
	13-14	7.12 (6.25-8.11)	6.86 (5.86-7.83)	12.7 (10.9-15.4)	30.5 (23.9-36.5)	50.6 (36.0-62.0)	718
Females	11-12	6.75 (5.79-7.87)	5.98 (5.05-7.49)	13.0 (10.3-17.5)	31.9 (23.9-45.6)	55.2 (41.4-83.2)	708
	13-14	6.06 (5.07-7.24)	5.44 (4.53-6.68)	12.1 (9.75-14.6)	28.3 (22.3-36.0)	45.1 (36.0-63.1)	831

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 1.25 and 0.26, respectively.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Total Arsenic (creatinine corrected) (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg As/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	6.69 (5.68-7.87)	5.42 (4.46-6.87)	10.9 (8.91-14.7)	24.5 (19.6-29.7)	43.6 (24.8-91.3)	876
	13-14	6.28 (5.49-7.18)	5.31 (4.79-6.04)	9.35 (7.78-11.4)	24.5 (15.0-34.7)	41.5 (28.4-54.0)	975
Age group							
20-49 years	11-12	6.38 (5.43-7.49)	5.27 (4.21-6.76)	10.3 (8.80-13.3)	22.8 (16.1-28.8)	38.6 (22.1-103)	522
18-49 years	13-14	6.02 (5.07-7.14)	5.22 (4.45-5.91)	8.55 (7.34-11.4)	24.4 (13.4-35.3)	35.8 (21.5-52.1)	590
50 years and older	11-12	7.20 (5.62-9.22)	5.85 (4.77-7.46)	12.4 (8.32-19.6)	26.1 (19.6-50.6)	70.5 (20.4-108)	354
	13-14	6.87 (6.21-7.61)	5.72 (5.00-6.88)	10.3 (8.69-12.5)	24.6 (14.7-52.6)	53.8 (25.6-91.3)	385
Gender							
Males	11-12	6.27 (5.17-7.61)	5.18 (4.43-6.80)	10.6 (8.79-14.7)	21.7 (16.1-24.8)	30.6 (22.6-70.5)	527
	13-14	6.33 (5.36-7.48)	5.61 (4.81-6.59)	8.74 (7.58-11.8)	24.6 (13.0-35.8)	35.8 (19.7-64.6)	523
Females	11-12	7.25 (5.95-8.82)	5.52 (4.38-6.93)	11.1 (8.31-15.3)	30.8 (16.7-65.0)	72.1 (24.5-179)	349
	13-14	6.23 (5.40-7.19)	5.22 (4.45-5.78)	9.75 (7.25-11.9)	24.5 (17.0-33.9)	49.5 (24.9-62.0)	452
Nonsmokers†							
Total	11-12	8.57 (7.44-9.86)	7.18 (6.16-8.60)	16.2 (12.9-20.3)	33.7 (28.3-44.3)	52.8 (39.9-71.8)	1342
	13-14	7.74 (6.93-8.65)	6.56 (5.69-7.64)	13.0 (11.1-15.1)	31.8 (24.5-40.8)	57.2 (47.9-74.7)	1548
Age group							
20-49 years	11-12	8.06 (7.00-9.28)	6.88 (5.54-8.60)	15.0 (11.5-20.1)	31.7 (26.2-39.4)	47.5 (36.6-70.1)	670
18-49 years	13-14	6.81 (6.12-7.58)	5.94 (5.15-6.67)	11.1 (9.35-12.4)	23.7 (18.7-29.9)	48.7 (29.9-68.2)	821
50 years and older	11-12	9.14 (7.40-11.3)	7.57 (6.16-9.71)	18.3 (12.8-24.6)	37.5 (27.9-52.8)	53.5 (37.5-94.6)	672
	13-14	8.99 (7.50-10.8)	7.67 (5.83-9.93)	16.0 (11.6-23.8)	40.8 (27.1-61.4)	69.6 (49.8-83.6)	727
Gender							
Males	11-12	7.31 (5.97-8.94)	6.29 (5.05-8.02)	14.3 (10.6-18.1)	32.2 (20.2-44.3)	48.7 (32.8-69.6)	634
	13-14	6.93 (6.17-7.78)	5.82 (4.87-6.89)	12.0 (10.0-13.7)	27.6 (20.8-40.8)	49.3 (37.9-67.9)	717
Females	11-12	9.70 (8.62-10.9)	7.98 (6.87-9.34)	19.1 (13.7-24.4)	38.2 (28.7-48.6)	63.6 (45.9-86.7)	708
	13-14	8.56 (7.48-9.80)	7.33 (6.39-8.36)	14.7 (11.7-17.0)	34.3 (24.5-43.2)	68.3 (41.8-98.1)	831

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Arsenic (V) acid (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg As/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	*	< LOD	< LOD	< LOD	1.10 (<LOD-3.06)	871
	13-14	*	< LOD	< LOD	< LOD	< LOD	972
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	1.29 (<LOD-3.87)	521
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	588
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	350
	13-14	*	< LOD	< LOD	< LOD	< LOD	384
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	1.37 (<LOD-6.54)	524
	13-14	*	< LOD	< LOD	< LOD	< LOD	523
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	347
	13-14	*	< LOD	< LOD	< LOD	< LOD	449
Nonsmokers†							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	1343
	13-14	*	< LOD	< LOD	< LOD	< LOD	1549
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	671
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	824
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	672
	13-14	*	< LOD	< LOD	< LOD	< LOD	725
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	< LOD	635
	13-14	*	< LOD	< LOD	< LOD	< LOD	715
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	708
	13-14	*	< LOD	< LOD	< LOD	< LOD	834

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.87 and 0.79, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Arsenic (V) acid (creatinine corrected) (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg As/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	*	< LOD	< LOD	< LOD	3.65 (<LOD-5.17)	871
	13-14	*	< LOD	< LOD	< LOD	< LOD	971
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	3.65 (<LOD-4.13)	521
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	587
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	350
	13-14	*	< LOD	< LOD	< LOD	< LOD	384
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	3.44 (<LOD-3.76)	524
	13-14	*	< LOD	< LOD	< LOD	< LOD	522
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	347
	13-14	*	< LOD	< LOD	< LOD	< LOD	449
Nonsmokers†							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	1342
	13-14	*	< LOD	< LOD	< LOD	< LOD	1548
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	670
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	824
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	672
	13-14	*	< LOD	< LOD	< LOD	< LOD	724
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	< LOD	634
	13-14	*	< LOD	< LOD	< LOD	< LOD	714
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	708
	13-14	*	< LOD	< LOD	< LOD	< LOD	834

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Arsenobetaine (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg As/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	*	< LOD	3.00 (1.36-5.05)	13.1 (8.32-20.4)	25.7 (16.7-68.4)	871
	13-14	*	< LOD	3.36 (2.20-5.03)	13.1 (7.32-20.0)	25.1 (15.1-52.1)	972
Age group							
20-49 years	11-12	*	< LOD	2.34 (1.32-4.47)	11.9 (6.90-20.1)	24.2 (11.9-42.8)	521
18-49 years	13-14	*	< LOD	3.78 (2.27-5.26)	14.7 (7.32-20.4)	24.6 (15.1-52.5)	588
50 years and older	11-12	*	< LOD	4.03 (1.27-7.44)	13.7 (6.54-46.5)	46.5 (8.47-114)	350
	13-14	*	< LOD	2.25 (1.60-3.93)	9.75 (5.60-18.5)	25.6 (11.9-48.4)	384
Gender							
Males	11-12	*	< LOD	3.26 (1.29-5.05)	11.0 (7.06-18.4)	25.1 (13.1-47.8)	524
	13-14	*	< LOD	3.92 (2.41-6.44)	18.5 (6.38-35.2)	35.2 (15.5-61.6)	523
Females	11-12	*	< LOD	2.82 (1.32-6.35)	16.8 (7.50-24.2)	44.8 (13.3-141)	347
	13-14	*	< LOD	2.83 (1.28-5.08)	12.1 (4.83-19.6)	19.6 (12.4-26.5)	449
Nonsmokers†							
Total	11-12	*	1.25 (<LOD-1.72)	5.83 (4.45-7.46)	18.7 (13.3-26.2)	37.4 (24.1-60.3)	1343
	13-14	*	< LOD	4.60 (3.24-6.31)	18.7 (14.1-22.0)	35.4 (26.1-44.6)	1549
Age group							
20-49 years	11-12	*	< LOD	4.95 (3.58-6.54)	19.3 (11.8-24.1)	37.4 (24.1-53.4)	671
18-49 years	13-14	*	< LOD	3.36 (2.72-4.61)	14.1 (9.20-21.3)	29.4 (19.2-41.8)	824
50 years and older	11-12	*	1.55 (<LOD-2.34)	7.21 (4.05-10.3)	18.6 (12.3-35.2)	38.8 (19.2-68.3)	672
	13-14	*	1.39 (<LOD-2.21)	6.11 (3.33-10.6)	22.0 (13.2-35.4)	39.7 (29.0-53.5)	725
Gender							
Males	11-12	*	1.30 (<LOD-2.09)	6.27 (4.10-9.30)	23.3 (12.8-33.9)	37.4 (25.5-63.9)	635
	13-14	*	1.27 (<LOD-1.84)	4.95 (3.33-6.95)	18.7 (11.7-23.7)	36.6 (21.9-46.0)	715
Females	11-12	*	< LOD	5.65 (4.03-7.21)	18.2 (12.2-23.6)	36.9 (21.4-59.6)	708
	13-14	*	< LOD	4.16 (2.76-6.13)	18.4 (12.5-24.3)	34.1 (23.9-50.7)	834

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 1.19 and 1.16, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Arsenobetaine (creatinine corrected) (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg As/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	*	< LOD	4.00 (2.90-5.25)	12.5 (8.40-20.6)	29.1 (16.4-67.2)	871
	13-14	*	< LOD	3.89 (3.04-4.82)	12.2 (6.89-21.2)	34.0 (14.6-51.6)	971
Age group							
20-49 years	11-12	*	< LOD	4.00 (2.74-4.94)	10.3 (6.67-21.0)	26.8 (10.2-55.5)	521
18-49 years	13-14	*	< LOD	3.83 (2.83-5.16)	12.9 (6.31-31.5)	34.0 (12.2-51.6)	587
50 years and older	11-12	*	< LOD	4.29 (2.83-9.20)	15.4 (11.9-39.6)	56.0 (12.3-82.7)	350
	13-14	*	< LOD	4.18 (2.81-5.71)	11.4 (7.32-21.2)	36.1 (14.2-53.2)	384
Gender							
Males	11-12	*	< LOD	3.50 (2.47-4.94)	9.92 (5.99-13.8)	16.5 (12.0-39.7)	524
	13-14	*	< LOD	3.73 (2.71-4.97)	11.5 (5.01-34.0)	34.0 (9.62-51.2)	522
Females	11-12	*	< LOD	4.88 (2.90-10.2)	18.8 (10.6-30.3)	39.6 (16.5-100)	347
	13-14	*	< LOD	4.48 (3.31-5.38)	12.9 (7.45-19.0)	31.5 (12.2-51.8)	449
Nonsmokers†							
Total	11-12	*	2.10 (<LOD-2.48)	7.55 (5.25-10.2)	21.8 (14.4-35.7)	39.6 (27.5-46.8)	1342
	13-14	*	< LOD	5.98 (4.61-7.62)	19.2 (14.5-26.3)	44.3 (34.4-59.4)	1548
Age group							
20-49 years	11-12	*	< LOD	6.21 (4.34-10.2)	17.2 (15.3-24.0)	35.1 (22.6-42.6)	670
18-49 years	13-14	*	< LOD	4.21 (3.44-5.48)	13.8 (8.90-19.2)	35.5 (19.2-54.7)	824
50 years and older	11-12	*	2.43 (<LOD-3.37)	8.09 (4.78-14.3)	26.1 (14.0-42.6)	43.4 (26.1-76.9)	672
	13-14	*	2.48 (<LOD-3.34)	8.44 (5.08-14.5)	26.9 (14.9-46.0)	56.1 (37.7-71.5)	724
Gender							
Males	11-12	*	1.75 (<LOD-2.10)	5.71 (3.57-10.0)	20.3 (11.2-35.7)	35.7 (20.7-52.1)	634
	13-14	*	1.67 (<LOD-2.00)	5.49 (3.80-7.92)	16.7 (12.7-24.4)	40.5 (24.1-59.4)	714
Females	11-12	*	< LOD	8.46 (6.46-11.3)	23.7 (16.6-36.9)	41.4 (29.2-66.4)	708
	13-14	*	< LOD	6.45 (4.82-8.13)	19.9 (13.8-33.3)	46.0 (33.3-82.4)	834

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Arsenocholine (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg As/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	871
	13-14	*	< LOD	< LOD	.170 (<LOD-.250)	.280 (.190-.350)	972
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	521
18-49 years	13-14	*	< LOD	< LOD	.190 (.130-.240)	.280 (.190-.350)	588
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	350
	13-14	*	< LOD	< LOD	< LOD	.270 (<LOD-.410)	384
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	.310 (<LOD-4.53)	524
	13-14	*	< LOD	< LOD	.200 (<LOD-.280)	.280 (.170-.410)	523
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	347
	13-14	*	< LOD	< LOD	.150 (<LOD-.240)	.240 (.190-.300)	449
Nonsmokers†							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	1343
	13-14	*	< LOD	< LOD	.220 (.150-.280)	.350 (.290-.380)	1549
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	671
18-49 years	13-14	*	< LOD	< LOD	.200 (<LOD-.280)	.320 (.260-.380)	824
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	672
	13-14	*	< LOD	< LOD	.220 (.140-.330)	.380 (.300-.390)	725
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	< LOD	635
	13-14	*	< LOD	< LOD	.250 (.130-.330)	.360 (.290-.430)	715
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	708
	13-14	*	< LOD	< LOD	.200 (.110-.260)	.320 (.220-.380)	834

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.28 and 0.11, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Arsenocholine (creatinine corrected) (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg As/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	871
	13-14	*	< LOD	< LOD	.286 (<LOD-.333)	.381 (.348-.444)	971
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	521
18-49 years	13-14	*	< LOD	< LOD	.250 (.190-.333)	.364 (.286-.485)	587
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	350
	13-14	*	< LOD	< LOD	< LOD	.444 (<LOD-.615)	384
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	1.18 (<LOD-1.34)	524
	13-14	*	< LOD	< LOD	.229 (<LOD-.296)	.333 (.229-.444)	522
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	347
	13-14	*	< LOD	< LOD	.320 (<LOD-.442)	.471 (.364-.727)	449
Nonsmokers†							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	1342
	13-14	*	< LOD	< LOD	.364 (.320-.421)	.578 (.471-.667)	1548
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	670
18-49 years	13-14	*	< LOD	< LOD	.296 (<LOD-.364)	.444 (.364-.523)	824
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	672
	13-14	*	< LOD	< LOD	.471 (.333-.571)	.658 (.506-.800)	724
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	< LOD	634
	13-14	*	< LOD	< LOD	.258 (.235-.333)	.571 (.333-.660)	714
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	708
	13-14	*	< LOD	< LOD	.421 (.364-.444)	.622 (.471-.727)	834

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Arsenous (III) acid (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg As/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	*	< LOD	< LOD	.750 (.580-.980)	1.01 (.740-1.75)	871
	13-14	.338 (.291-.393)	.500 (.400-.590)	.740 (.660-.840)	1.05 (.900-1.21)	1.30 (1.14-1.43)	972
Age group							
20-49 years	11-12	*	< LOD	.510 (<LOD-.680)	.890 (.640-1.31)	1.31 (.890-2.22)	521
18-49 years	13-14	.394 (.332-.467)	.560 (.460-.640)	.780 (.680-.870)	1.10 (.920-1.27)	1.32 (1.14-1.46)	588
50 years and older	11-12	*	< LOD	< LOD	.500 (<LOD-.740)	.640 (.490-.920)	350
	13-14	*	.280 (<LOD-.460)	.660 (.540-.820)	.970 (.830-1.17)	1.24 (.970-1.48)	384
Gender							
Males	11-12	*	< LOD	.520 (<LOD-.720)	.900 (.680-1.31)	1.40 (.920-2.22)	524
	13-14	.401 (.327-.491)	.580 (.440-.660)	.800 (.680-.920)	1.14 (.940-1.33)	1.35 (1.15-1.52)	523
Females	11-12	*	< LOD	< LOD	.520 (<LOD-.640)	.640 (.520-.830)	347
	13-14	.283 (.245-.327)	.430 (.280-.500)	.680 (.590-.780)	.940 (.800-1.20)	1.23 (.930-1.48)	449
Nonsmokers†							
Total	11-12	*	< LOD	.490 (<LOD-.580)	.810 (.720-.930)	1.07 (.940-1.18)	1343
	13-14	.298 (.260-.341)	.430 (.320-.530)	.720 (.640-.790)	.960 (.870-1.05)	1.12 (1.05-1.22)	1549
Age group							
20-49 years	11-12	*	< LOD	.580 (.480-.710)	.870 (.800-1.08)	1.25 (1.05-1.48)	671
18-49 years	13-14	.364 (.316-.420)	.520 (.410-.590)	.770 (.690-.860)	1.04 (.960-1.11)	1.19 (1.12-1.35)	824
50 years and older	11-12	*	< LOD	< LOD	.700 (.550-.830)	.920 (.700-1.15)	672
	13-14	*	.240 (<LOD-.410)	.640 (.580-.690)	.870 (.790-.940)	1.03 (.940-1.11)	725
Gender							
Males	11-12	*	< LOD	.580 (.490-.690)	.940 (.820-1.12)	1.18 (1.05-1.47)	635
	13-14	.358 (.304-.421)	.540 (.410-.630)	.800 (.710-.870)	.990 (.940-1.08)	1.17 (1.06-1.35)	715
Females	11-12	*	< LOD	< LOD	.740 (.570-.820)	.880 (.800-1.07)	708
	13-14	*	.340 (.150-.440)	.630 (.580-.700)	.870 (.790-1.00)	1.10 (.950-1.20)	834

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.48 and 0.12, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Arsenous (III) acid (creatinine corrected) (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg As/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	*	< LOD	< LOD	1.37 (1.06-1.70)	1.89 (1.42-2.13)	871
	13-14	.348 (.298-.405)	.374 (.320-.444)	.641 (.552-.776)	1.01 (.900-1.17)	1.37 (1.10-1.63)	971
Age group							
20-49 years	11-12	*	< LOD	.773 (<LOD-.944)	1.42 (1.06-2.00)	2.00 (1.35-2.91)	521
18-49 years	13-14	.372 (.314-.440)	.398 (.331-.473)	.641 (.561-.777)	1.07 (.900-1.21)	1.38 (1.10-1.63)	587
50 years and older	11-12	*	< LOD	< LOD	1.31 (<LOD-1.55)	1.50 (1.26-2.13)	350
	13-14	*	.348 (<LOD-.459)	.641 (.459-.838)	.944 (.816-1.13)	1.16 (1.00-1.80)	384
Gender							
Males	11-12	*	< LOD	.694 (<LOD-.850)	1.35 (.971-1.89)	2.00 (1.26-2.83)	524
	13-14	.362 (.302-.433)	.381 (.320-.459)	.620 (.505-.730)	1.00 (.776-1.25)	1.27 (.985-1.65)	522
Females	11-12	*	< LOD	< LOD	1.37 (<LOD-1.70)	1.70 (1.37-2.13)	347
	13-14	.333 (.279-.398)	.361 (.276-.443)	.675 (.559-.847)	1.01 (.900-1.21)	1.42 (1.10-1.81)	449
Nonsmokers†							
Total	11-12	*	< LOD	.791 (<LOD-.855)	1.36 (1.21-1.55)	1.81 (1.54-2.00)	1342
	13-14	.351 (.304-.406)	.373 (.308-.444)	.701 (.597-.827)	1.21 (.989-1.35)	1.55 (1.31-1.85)	1548
Age group							
20-49 years	11-12	*	< LOD	.815 (.723-.919)	1.48 (1.17-1.82)	1.96 (1.64-2.43)	670
18-49 years	13-14	.389 (.326-.464)	.401 (.329-.482)	.784 (.604-.943)	1.24 (1.02-1.57)	1.67 (1.26-2.06)	824
50 years and older	11-12	*	< LOD	< LOD	1.26 (1.13-1.42)	1.67 (1.36-1.93)	672
	13-14	*	.320 (<LOD-.406)	.620 (.560-.732)	1.04 (.861-1.30)	1.43 (1.30-1.59)	724
Gender							
Males	11-12	*	< LOD	.659 (.574-.708)	1.03 (.850-1.19)	1.48 (1.17-1.79)	634
	13-14	.350 (.301-.406)	.371 (.301-.445)	.681 (.571-.806)	1.21 (.919-1.41)	1.51 (1.30-1.85)	714
Females	11-12	*	< LOD	< LOD	1.54 (1.36-1.81)	2.10 (1.69-2.62)	708
	13-14	*	.375 (.299-.445)	.711 (.612-.864)	1.17 (.982-1.35)	1.55 (1.30-1.85)	834

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Dimethylarsinic acid (2011 – 2014)

Metabolite of Arsenic

Geometric mean and selected percentiles of urine concentrations (in µg As/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	3.22 (2.83-3.66)	2.80 (2.45-3.29)	5.72 (4.29-7.10)	10.8 (7.78-16.1)	16.3 (10.9-24.3)	871
	13-14	3.15 (2.83-3.51)	3.10 (2.69-3.48)	5.15 (4.51-5.95)	7.76 (6.76-9.70)	11.4 (8.76-14.1)	972
Age group							
20-49 years	11-12	3.17 (2.71-3.70)	2.95 (2.34-3.79)	5.48 (4.08-6.76)	8.92 (7.34-12.5)	14.6 (10.0-19.4)	521
18-49 years	13-14	3.22 (2.84-3.66)	3.17 (2.69-3.76)	5.26 (4.66-5.96)	7.33 (6.81-9.19)	10.5 (7.77-12.8)	588
50 years and older	11-12	3.31 (2.77-3.95)	2.58 (2.40-3.05)	5.92 (3.65-9.94)	13.3 (7.98-28.8)	20.2 (10.4-30.1)	350
	13-14	3.01 (2.64-3.43)	2.93 (2.37-3.34)	4.97 (4.12-6.30)	8.58 (6.09-12.3)	12.3 (8.64-16.8)	384
Gender							
Males	11-12	3.55 (3.14-4.01)	3.05 (2.57-3.91)	6.45 (4.96-8.96)	13.3 (9.85-16.8)	17.6 (13.3-30.1)	524
	13-14	3.34 (3.00-3.72)	3.34 (2.86-3.94)	5.75 (4.85-6.34)	8.19 (7.25-9.80)	11.1 (8.76-12.8)	523
Females	11-12	2.84 (2.48-3.27)	2.57 (2.32-3.03)	4.41 (3.62-5.22)	7.95 (6.02-10.5)	11.8 (7.92-20.2)	347
	13-14	2.97 (2.58-3.41)	2.78 (2.24-3.34)	4.74 (4.07-5.95)	7.33 (6.02-10.2)	11.4 (7.77-15.1)	449
Nonsmokers†							
Total	11-12	3.56 (3.26-3.89)	3.44 (3.00-3.87)	5.93 (5.26-6.85)	9.87 (8.57-11.7)	14.2 (12.1-16.8)	1343
	13-14	3.18 (2.91-3.49)	3.02 (2.63-3.49)	5.26 (4.67-5.89)	8.78 (7.86-9.62)	11.8 (10.2-15.0)	1549
Age group							
20-49 years	11-12	3.71 (3.31-4.17)	3.56 (3.10-4.14)	6.74 (5.61-7.65)	10.6 (8.92-12.3)	15.9 (12.2-18.1)	671
18-49 years	13-14	3.26 (2.98-3.57)	3.10 (2.69-3.57)	5.31 (4.68-5.87)	9.03 (7.62-10.7)	11.8 (10.5-16.4)	824
50 years and older	11-12	3.40 (3.09-3.74)	3.21 (2.91-3.72)	5.44 (4.52-6.61)	9.02 (7.71-11.1)	13.6 (9.70-17.8)	672
	13-14	3.09 (2.77-3.45)	2.87 (2.36-3.53)	5.21 (4.31-6.31)	8.52 (7.69-9.21)	11.9 (9.62-15.0)	725
Gender							
Males	11-12	3.95 (3.53-4.42)	3.89 (3.33-4.52)	6.30 (5.30-7.68)	10.5 (8.45-13.7)	15.9 (12.1-17.8)	635
	13-14	3.32 (3.07-3.60)	3.27 (2.87-3.76)	5.45 (4.98-6.03)	8.56 (7.84-9.85)	11.6 (9.85-15.6)	715
Females	11-12	3.28 (2.97-3.62)	3.01 (2.65-3.55)	5.53 (4.65-6.29)	9.52 (8.28-11.1)	13.8 (10.7-17.5)	708
	13-14	3.06 (2.73-3.44)	2.77 (2.37-3.26)	4.95 (3.98-6.01)	8.82 (7.58-10.0)	11.9 (9.79-15.7)	834

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#). Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 1.8 and 1.91, respectively.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Dimethylarsinic acid (creatinine corrected) (2011 – 2014)

Metabolite of Arsenic

Geometric mean and selected percentiles of urine concentrations (in µg As/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	3.53 (3.28-3.79)	3.27 (3.08-3.54)	5.56 (5.14-6.05)	8.95 (7.47-10.1)	10.9 (9.74-13.8)	871
	13-14	3.24 (2.98-3.52)	3.03 (2.81-3.36)	4.82 (4.32-5.19)	7.46 (6.14-8.94)	10.4 (7.94-12.3)	971
Age group							
20-49 years	11-12	3.28 (2.99-3.61)	3.10 (2.65-3.56)	5.20 (4.45-6.04)	8.47 (6.48-9.46)	10.6 (8.12-12.7)	521
18-49 years	13-14	3.04 (2.73-3.38)	2.83 (2.55-3.22)	4.50 (3.74-5.08)	6.19 (5.76-7.69)	9.51 (7.09-11.4)	587
50 years and older	11-12	3.94 (3.48-4.46)	3.49 (3.20-4.06)	6.83 (4.77-7.95)	10.1 (7.00-20.2)	13.4 (10.1-25.1)	350
	13-14	3.69 (3.19-4.26)	3.57 (2.87-4.38)	5.40 (4.57-6.84)	8.94 (6.69-12.3)	12.3 (8.88-25.4)	384
Gender							
Males	11-12	3.35 (3.13-3.59)	3.13 (2.82-3.29)	5.30 (4.95-6.33)	9.37 (7.30-10.1)	10.6 (9.37-13.0)	524
	13-14	3.01 (2.75-3.31)	2.81 (2.65-3.27)	4.38 (3.94-4.82)	6.14 (5.16-7.74)	8.94 (6.14-11.4)	522
Females	11-12	3.76 (3.30-4.28)	3.70 (3.10-4.23)	5.87 (4.64-7.00)	8.15 (7.00-11.5)	12.2 (8.10-21.4)	347
	13-14	3.49 (3.09-3.95)	3.24 (2.85-3.85)	5.19 (4.47-6.08)	8.41 (6.28-10.5)	12.3 (8.31-14.9)	449
Nonsmokers†							
Total	11-12	4.15 (3.90-4.41)	3.92 (3.62-4.23)	6.43 (5.76-7.25)	10.8 (9.66-12.2)	14.8 (12.8-16.3)	1342
	13-14	3.75 (3.49-4.03)	3.55 (3.22-3.91)	5.70 (5.14-6.21)	9.54 (8.26-10.6)	13.1 (11.6-15.0)	1548
Age group							
20-49 years	11-12	4.06 (3.74-4.40)	3.95 (3.50-4.42)	6.61 (5.92-7.38)	10.6 (9.38-12.4)	14.1 (11.9-15.9)	670
18-49 years	13-14	3.48 (3.25-3.73)	3.31 (2.96-3.63)	5.13 (4.78-5.70)	8.44 (7.34-9.33)	12.3 (9.71-13.5)	824
50 years and older	11-12	4.25 (3.86-4.68)	3.88 (3.46-4.43)	6.14 (5.29-7.47)	11.3 (9.37-12.8)	15.4 (11.9-19.7)	672
	13-14	4.10 (3.71-4.52)	3.86 (3.40-4.38)	6.43 (5.53-7.33)	10.6 (8.67-12.8)	14.6 (12.4-16.9)	724
Gender							
Males	11-12	3.53 (3.18-3.91)	3.31 (3.03-3.78)	5.32 (4.56-6.22)	8.34 (7.04-10.1)	12.8 (9.07-15.8)	634
	13-14	3.24 (2.98-3.52)	3.00 (2.77-3.33)	4.72 (4.31-5.11)	7.99 (7.29-9.33)	11.0 (10.0-13.5)	714
Females	11-12	4.71 (4.44-5.00)	4.54 (4.23-4.70)	7.49 (6.97-8.60)	11.9 (10.3-14.0)	15.9 (14.0-17.2)	708
	13-14	4.29 (3.92-4.68)	4.03 (3.66-4.56)	6.43 (5.81-7.13)	10.7 (8.72-12.8)	13.9 (12.4-16.9)	834

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Monomethylarsonic acid (2011 – 2014)

Metabolite of Arsenic

Geometric mean and selected percentiles of urine concentrations (in µg As/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	*	< LOD	< LOD	1.38 (1.09-1.79)	1.93 (1.52-2.18)	871
	13-14	.446 (.401-.496)	.510 (.430-.590)	.890 (.820-.990)	1.36 (1.18-1.53)	1.72 (1.42-2.04)	972
Age group							
20-49 years	11-12	*	< LOD	.920 (<LOD-1.07)	1.50 (1.23-1.93)	2.11 (1.52-3.33)	521
18-49 years	13-14	.484 (.423-.553)	.560 (.470-.680)	.920 (.830-1.03)	1.36 (1.18-1.55)	1.70 (1.39-1.97)	588
50 years and older	11-12	*	< LOD	< LOD	1.12 (.960-1.44)	1.61 (1.12-2.04)	350
	13-14	.378 (.318-.448)	.370 (.250-.460)	.830 (.600-1.01)	1.32 (1.01-1.91)	1.81 (1.15-3.22)	384
Gender							
Males	11-12	*	< LOD	.990 (<LOD-1.18)	1.71 (1.38-2.10)	2.18 (1.73-3.39)	524
	13-14	.490 (.421-.571)	.520 (.450-.720)	.990 (.840-1.10)	1.44 (1.12-1.72)	1.74 (1.44-2.00)	523
Females	11-12	*	< LOD	< LOD	1.07 (.920-1.23)	1.31 (1.10-1.55)	347
	13-14	.404 (.361-.452)	.470 (.340-.550)	.810 (.680-.900)	1.27 (.960-1.52)	1.55 (1.27-2.56)	449
Nonsmokers†							
Total	11-12	*	< LOD	< LOD	1.32 (1.17-1.54)	1.85 (1.57-2.07)	1343
	13-14	.402 (.357-.452)	.440 (.360-.530)	.770 (.720-.850)	1.19 (1.07-1.33)	1.54 (1.27-1.88)	1549
Age group							
20-49 years	11-12	*	< LOD	.940 (<LOD-1.06)	1.57 (1.26-1.88)	2.04 (1.76-2.39)	671
18-49 years	13-14	.429 (.388-.475)	.480 (.400-.540)	.810 (.740-.870)	1.24 (1.08-1.38)	1.60 (1.31-1.95)	824
50 years and older	11-12	*	< LOD	< LOD	1.13 (.970-1.41)	1.53 (1.28-1.75)	672
	13-14	.371 (.322-.429)	.390 (.290-.490)	.740 (.650-.830)	1.14 (1.04-1.32)	1.44 (1.22-1.80)	725
Gender							
Males	11-12	*	< LOD	.960 (<LOD-1.18)	1.52 (1.23-1.85)	2.05 (1.76-2.40)	635
	13-14	.461 (.407-.522)	.520 (.440-.630)	.900 (.830-.980)	1.28 (1.13-1.41)	1.64 (1.31-1.88)	715
Females	11-12	*	< LOD	< LOD	1.17 (1.00-1.44)	1.58 (1.42-1.88)	708
	13-14	.354 (.312-.402)	.380 (.250-.480)	.710 (.610-.750)	1.10 (.890-1.27)	1.39 (1.13-1.89)	834

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.89 and 0.2, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Monomethylarsonic acid (creatinine corrected) (2011 – 2014)

Metabolite of Arsenic

Geometric mean and selected percentiles of urine concentrations (in µg As/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	*	< LOD	< LOD	2.33 (2.03-2.63)	3.32 (2.63-3.72)	871
	13-14	.458 (.415-.506)	.471 (.424-.519)	.761 (.671-.867)	1.16 (1.00-1.30)	1.42 (1.27-1.69)	971
Age group							
20-49 years	11-12	*	< LOD	1.29 (<LOD-1.54)	2.52 (1.85-3.32)	3.71 (2.10-4.20)	521
18-49 years	13-14	.456 (.409-.510)	.484 (.434-.520)	.728 (.681-.824)	1.08 (.975-1.15)	1.27 (1.11-1.41)	587
50 years and older	11-12	*	< LOD	< LOD	2.17 (1.91-2.63)	2.86 (2.33-3.50)	350
	13-14	.463 (.373-.574)	.445 (.350-.579)	.800 (.609-1.13)	1.33 (.978-1.84)	1.73 (1.22-3.07)	384
Gender							
Males	11-12	*	< LOD	1.24 (<LOD-1.40)	2.09 (1.58-2.86)	3.50 (2.03-3.72)	524
	13-14	.443 (.397-.493)	.455 (.408-.513)	.746 (.636-.866)	1.07 (.930-1.20)	1.33 (1.13-1.60)	522
Females	11-12	*	< LOD	< LOD	2.42 (2.10-2.92)	3.15 (2.42-3.94)	347
	13-14	.476 (.422-.536)	.491 (.400-.579)	.778 (.654-.967)	1.27 (.978-1.45)	1.48 (1.27-2.13)	449
Nonsmokers†							
Total	11-12	*	< LOD	< LOD	2.31 (1.92-2.52)	2.74 (2.42-3.53)	1342
	13-14	.474 (.424-.529)	.491 (.424-.556)	.820 (.737-.911)	1.27 (1.16-1.43)	1.62 (1.39-1.91)	1548
Age group							
20-49 years	11-12	*	< LOD	1.43 (<LOD-1.66)	2.33 (1.80-2.86)	3.32 (2.52-3.94)	670
18-49 years	13-14	.458 (.402-.522)	.478 (.415-.540)	.785 (.696-.875)	1.24 (1.06-1.43)	1.55 (1.29-1.94)	824
50 years and older	11-12	*	< LOD	< LOD	2.25 (1.85-2.52)	2.63 (2.33-3.50)	672
	13-14	.492 (.439-.552)	.500 (.424-.582)	.862 (.754-.991)	1.35 (1.18-1.53)	1.69 (1.44-2.04)	724
Gender							
Males	11-12	*	< LOD	1.07 (<LOD-1.17)	1.70 (1.43-1.91)	2.17 (1.76-2.67)	634
	13-14	.450 (.406-.499)	.473 (.402-.541)	.762 (.683-.857)	1.20 (1.04-1.32)	1.53 (1.30-1.73)	714
Females	11-12	*	< LOD	< LOD	2.63 (2.33-2.86)	3.50 (2.69-4.85)	708
	13-14	.496 (.437-.563)	.508 (.429-.583)	.874 (.761-1.02)	1.36 (1.18-1.55)	1.77 (1.39-2.13)	834

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Trimethylarsine oxide (2011 – 2012)

Geometric mean and selected percentiles of urine concentrations (in µg As/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	871
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	521
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	350
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	< LOD	524
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	347
Nonsmokers†							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	1343
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	671
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	672
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	< LOD	635
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	708

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.25.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Trimethylarsine oxide (creatinine corrected) (2011 – 2012)

Geometric mean and selected percentiles of urine concentrations (in µg As/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	871
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	521
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	350
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	< LOD	524
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	347
Nonsmokers†							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	1342
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	670
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	672
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	< LOD	634
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	708

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
 < LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Barium (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	1.16 (1.06-1.28)	1.24 (1.04-1.37)	2.37 (1.98-2.77)	3.79 (3.25-4.31)	5.43 (4.02-6.73)	876
	13-14	1.14 (1.03-1.26)	1.12 (1.01-1.31)	2.21 (1.97-2.38)	4.06 (3.37-4.86)	5.98 (4.86-7.55)	957
Age group							
20-49 years	11-12	1.25 (1.13-1.38)	1.25 (1.01-1.47)	2.55 (1.98-3.20)	3.90 (3.35-4.45)	5.43 (4.25-6.52)	522
18-49 years	13-14	1.20 (1.04-1.37)	1.26 (.980-1.52)	2.31 (1.94-2.86)	4.09 (3.58-4.47)	6.25 (4.78-7.67)	583
50 years and older	11-12	1.04 (.875-1.24)	1.20 (.910-1.43)	2.19 (1.77-2.52)	3.43 (2.43-5.19)	5.34 (3.79-10.5)	354
	13-14	1.02 (.875-1.18)	1.03 (.890-1.15)	1.86 (1.37-2.70)	3.59 (2.68-5.47)	5.62 (3.47-12.5)	374
Gender							
Males	11-12	1.30 (1.10-1.54)	1.34 (1.00-1.81)	2.73 (1.94-3.27)	3.98 (3.27-5.49)	5.80 (3.99-8.89)	527
	13-14	1.19 (1.10-1.28)	1.24 (1.06-1.46)	2.16 (1.94-2.53)	3.88 (3.19-4.91)	5.96 (4.38-8.84)	512
Females	11-12	1.01 (.892-1.14)	1.01 (.870-1.18)	2.20 (1.64-2.55)	3.14 (2.55-3.91)	4.80 (3.78-5.52)	349
	13-14	1.08 (.934-1.26)	1.04 (.900-1.25)	2.31 (1.78-2.78)	4.09 (3.44-5.47)	6.31 (4.42-7.75)	445
Nonsmokers†							
Total	11-12	1.11 (1.02-1.20)	1.17 (1.03-1.28)	2.18 (1.98-2.45)	3.74 (3.39-4.02)	5.12 (4.61-5.57)	1343
	13-14	.998 (.925-1.08)	.980 (.880-1.12)	2.00 (1.79-2.20)	3.62 (3.15-4.19)	5.19 (4.38-5.61)	1487
Age group							
20-49 years	11-12	1.13 (1.03-1.25)	1.21 (1.08-1.38)	2.19 (1.94-2.58)	3.63 (3.20-4.15)	4.46 (4.21-5.52)	671
18-49 years	13-14	1.05 (.947-1.17)	1.03 (.870-1.22)	2.07 (1.80-2.56)	3.96 (3.19-4.78)	5.60 (4.45-6.26)	778
50 years and older	11-12	1.08 (.970-1.21)	1.09 (.890-1.29)	2.17 (1.79-2.53)	3.91 (3.01-5.13)	5.46 (4.62-7.13)	672
	13-14	.940 (.833-1.06)	.950 (.810-1.14)	1.83 (1.53-2.17)	3.19 (2.62-4.10)	4.94 (3.66-5.61)	709
Gender							
Males	11-12	1.20 (1.05-1.37)	1.25 (1.12-1.38)	2.18 (1.91-2.61)	3.85 (3.37-4.40)	5.78 (4.46-7.13)	635
	13-14	1.10 (.973-1.25)	1.09 (.920-1.30)	2.09 (1.73-2.65)	4.18 (3.15-5.05)	5.61 (5.05-6.04)	663
Females	11-12	1.04 (.928-1.17)	1.07 (.910-1.21)	2.16 (1.70-2.57)	3.63 (3.26-4.05)	5.05 (3.97-5.52)	708
	13-14	.921 (.838-1.01)	.870 (.790-1.03)	1.85 (1.64-2.16)	3.30 (3.04-3.74)	4.48 (4.02-5.19)	824

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.1 and 0.06, respectively.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Barium_BiomonitoringSummary.html

Urinary Barium (creatinine corrected) (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	1.28 (1.14-1.44)	1.31 (1.15-1.46)	2.14 (1.89-2.79)	4.22 (3.30-5.68)	6.17 (4.65-7.09)	876
	13-14	1.16 (1.05-1.28)	1.19 (.990-1.35)	2.21 (1.86-2.51)	3.39 (3.08-3.86)	4.51 (3.76-6.80)	956
Age group							
20-49 years	11-12	1.30 (1.12-1.50)	1.28 (1.07-1.38)	2.26 (1.84-3.00)	4.65 (3.30-5.76)	5.76 (4.13-7.22)	522
18-49 years	13-14	1.12 (.987-1.28)	1.13 (.956-1.35)	2.14 (1.82-2.48)	3.36 (3.08-3.70)	4.32 (3.53-6.68)	582
50 years and older	11-12	1.26 (1.12-1.40)	1.41 (1.24-1.54)	1.95 (1.76-2.74)	3.76 (3.00-5.68)	6.66 (3.43-7.36)	354
	13-14	1.25 (1.00-1.55)	1.23 (.932-1.52)	2.46 (1.74-2.99)	3.39 (2.74-5.68)	5.68 (3.36-14.4)	374
Gender							
Males	11-12	1.23 (1.07-1.42)	1.25 (1.04-1.48)	1.95 (1.78-2.68)	3.75 (2.81-5.76)	5.76 (3.49-7.75)	527
	13-14	1.05 (.957-1.16)	1.08 (.974-1.14)	1.89 (1.81-2.19)	3.26 (3.06-3.55)	4.24 (3.55-5.95)	511
Females	11-12	1.35 (1.10-1.65)	1.38 (1.15-1.70)	2.38 (1.79-3.67)	4.69 (3.04-6.46)	6.39 (3.94-10.4)	349
	13-14	1.28 (1.11-1.48)	1.33 (.990-1.61)	2.45 (1.83-3.05)	3.54 (3.11-4.12)	5.42 (3.76-9.44)	445
Nonsmokers†							
Total	11-12	1.29 (1.18-1.41)	1.31 (1.21-1.40)	2.29 (1.98-2.70)	3.85 (3.46-4.37)	6.04 (4.37-8.33)	1342
	13-14	1.19 (1.12-1.27)	1.14 (1.07-1.24)	2.07 (1.93-2.34)	3.97 (3.65-4.28)	5.19 (4.58-5.89)	1486
Age group							
20-49 years	11-12	1.24 (1.09-1.41)	1.28 (1.11-1.42)	2.04 (1.74-2.40)	3.49 (3.09-4.10)	5.17 (3.72-6.84)	670
18-49 years	13-14	1.15 (1.07-1.25)	1.10 (.994-1.21)	1.97 (1.79-2.26)	3.70 (2.93-4.32)	4.60 (4.20-5.89)	778
50 years and older	11-12	1.36 (1.22-1.50)	1.36 (1.21-1.52)	2.64 (2.15-2.99)	4.31 (3.50-5.54)	6.83 (4.71-9.68)	672
	13-14	1.24 (1.09-1.40)	1.19 (1.06-1.46)	2.24 (1.94-2.56)	4.25 (3.79-4.50)	5.70 (4.50-7.19)	708
Gender							
Males	11-12	1.07 (.954-1.20)	1.05 (.938-1.21)	1.87 (1.64-2.11)	3.20 (2.71-3.83)	4.26 (3.43-5.89)	634
	13-14	1.06 (.963-1.18)	1.04 (.926-1.13)	1.89 (1.63-2.17)	3.29 (2.69-4.17)	4.38 (3.53-4.78)	662
Females	11-12	1.50 (1.35-1.66)	1.45 (1.36-1.55)	2.67 (2.22-3.09)	4.71 (3.51-5.96)	7.71 (5.11-9.68)	708
	13-14	1.31 (1.21-1.41)	1.26 (1.14-1.45)	2.34 (2.02-2.69)	4.25 (3.76-4.94)	6.23 (5.45-7.86)	824

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Barium_BiomonitoringSummary.html

Urinary Cadmium (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	.308 (.264-.359)	.321 (.271-.411)	.683 (.552-.790)	1.29 (1.02-1.63)	1.85 (1.56-2.33)	876
	13-14	.239 (.221-.257)	.258 (.232-.284)	.547 (.485-.639)	.927 (.831-.995)	1.22 (1.05-1.38)	957
Age group							
20-49 years	11-12	.220 (.182-.265)	.229 (.164-.298)	.508 (.371-.622)	.873 (.684-1.14)	1.27 (1.01-1.49)	522
18-49 years	13-14	.171 (.158-.185)	.168 (.154-.189)	.372 (.316-.426)	.699 (.559-.770)	.821 (.754-.933)	583
50 years and older	11-12	.522 (.447-.609)	.479 (.423-.608)	1.03 (.741-1.51)	1.82 (1.52-2.89)	3.45 (2.10-3.89)	354
	13-14	.484 (.433-.540)	.497 (.413-.584)	.856 (.751-1.03)	1.32 (1.12-1.62)	1.75 (1.43-2.12)	374
Gender							
Males	11-12	.324 (.272-.385)	.368 (.292-.429)	.714 (.552-.844)	1.31 (.988-1.69)	1.69 (1.29-2.09)	527
	13-14	.214 (.191-.240)	.238 (.180-.282)	.507 (.436-.593)	.856 (.792-.982)	1.12 (.977-1.39)	512
Females	11-12	.289 (.229-.364)	.303 (.222-.416)	.629 (.455-.741)	1.25 (.783-2.05)	2.05 (1.16-2.53)	349
	13-14	.266 (.242-.293)	.277 (.246-.313)	.582 (.485-.721)	.950 (.804-1.12)	1.26 (1.12-1.55)	445
Nonsmokers†							
Total	11-12	.174 (.158-.192)	.176 (.161-.192)	.314 (.279-.366)	.615 (.525-.705)	.842 (.738-1.04)	1343
	13-14	.139 (.131-.148)	.147 (.135-.154)	.290 (.264-.313)	.570 (.515-.615)	.788 (.692-.907)	1487
Age group							
20-49 years	11-12	.130 (.113-.151)	.134 (.113-.155)	.233 (.185-.281)	.486 (.338-.610)	.642 (.578-.827)	671
18-49 years	13-14	.101 (.093-.110)	.094 (.087-.108)	.200 (.179-.229)	.358 (.312-.441)	.606 (.496-.654)	778
50 years and older	11-12	.236 (.212-.264)	.228 (.217-.259)	.395 (.336-.474)	.762 (.621-.873)	1.05 (.842-1.52)	672
	13-14	.200 (.184-.217)	.213 (.186-.232)	.391 (.335-.446)	.702 (.606-.803)	1.01 (.820-1.30)	709
Gender							
Males	11-12	.165 (.149-.184)	.169 (.154-.185)	.280 (.238-.338)	.546 (.412-.664)	.826 (.595-.939)	635
	13-14	.139 (.130-.149)	.148 (.131-.158)	.272 (.229-.314)	.516 (.435-.614)	.726 (.592-1.07)	663
Females	11-12	.181 (.160-.205)	.184 (.152-.217)	.347 (.300-.405)	.643 (.583-.782)	.923 (.780-1.35)	708
	13-14	.139 (.126-.155)	.146 (.126-.166)	.302 (.267-.340)	.603 (.526-.692)	.820 (.705-.965)	824

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.056 and 0.036, respectively.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Cadmium_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Cadmium_FactSheet.html

Urinary Cadmium (creatinine corrected) (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	.339 (.307-.374)	.372 (.333-.421)	.631 (.559-.734)	1.09 (.990-1.23)	1.48 (1.27-1.71)	876
	13-14	.244 (.219-.272)	.260 (.219-.311)	.525 (.436-.650)	.907 (.727-1.05)	1.15 (1.00-1.36)	956
Age group							
20-49 years	11-12	.228 (.201-.259)	.235 (.204-.267)	.424 (.363-.471)	.643 (.595-.735)	.935 (.725-1.19)	522
18-49 years	13-14	.160 (.149-.172)	.161 (.146-.175)	.295 (.270-.334)	.498 (.416-.650)	.727 (.584-.949)	582
50 years and older	11-12	.629 (.569-.696)	.594 (.507-.734)	.977 (.791-1.13)	1.48 (1.27-1.71)	1.97 (1.48-2.24)	354
	13-14	.594 (.540-.653)	.604 (.513-.675)	.899 (.722-1.05)	1.27 (1.09-1.49)	1.53 (1.25-1.79)	374
Gender							
Males	11-12	.305 (.260-.358)	.372 (.281-.434)	.565 (.470-.667)	.932 (.745-1.13)	1.25 (.907-1.72)	527
	13-14	.190 (.175-.206)	.192 (.173-.219)	.436 (.394-.466)	.697 (.602-.786)	.888 (.730-1.10)	511
Females	11-12	.386 (.332-.448)	.373 (.331-.458)	.735 (.595-.873)	1.28 (.975-1.51)	1.68 (1.19-2.28)	349
	13-14	.314 (.271-.364)	.334 (.270-.402)	.650 (.523-.767)	1.05 (.949-1.13)	1.27 (1.11-1.65)	445
Nonsmokers†							
Total	11-12	.203 (.185-.222)	.194 (.181-.218)	.353 (.317-.399)	.568 (.503-.660)	.870 (.638-1.03)	1342
	13-14	.166 (.158-.174)	.166 (.151-.184)	.301 (.272-.317)	.549 (.489-.608)	.771 (.675-.846)	1486
Age group							
20-49 years	11-12	.142 (.128-.158)	.138 (.122-.152)	.230 (.198-.275)	.398 (.310-.470)	.538 (.421-.741)	670
18-49 years	13-14	.111 (.101-.121)	.113 (.102-.121)	.186 (.161-.209)	.298 (.265-.328)	.421 (.364-.543)	778
50 years and older	11-12	.296 (.271-.322)	.296 (.257-.331)	.458 (.416-.526)	.759 (.613-.942)	1.09 (.892-1.22)	672
	13-14	.263 (.248-.278)	.260 (.235-.285)	.421 (.382-.455)	.726 (.622-.826)	.977 (.826-1.20)	708
Gender							
Males	11-12	.148 (.131-.166)	.143 (.132-.157)	.230 (.193-.280)	.405 (.324-.524)	.549 (.463-.713)	634
	13-14	.134 (.125-.144)	.132 (.114-.151)	.227 (.205-.261)	.369 (.334-.436)	.581 (.430-.669)	662
Females	11-12	.260 (.233-.289)	.271 (.241-.290)	.443 (.385-.477)	.671 (.568-.892)	1.03 (.823-1.22)	708
	13-14	.198 (.184-.213)	.203 (.180-.219)	.356 (.317-.395)	.627 (.581-.726)	.928 (.713-1.03)	824

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Cadmium_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Cadmium_FactSheet.html

Urinary Cesium (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	3.73 (3.50-3.99)	4.03 (3.60-4.42)	6.34 (5.94-6.68)	8.73 (7.76-10.5)	11.1 (8.82-11.9)	876
	13-14	3.97 (3.68-4.29)	4.14 (3.82-4.55)	6.95 (6.39-7.56)	9.72 (9.01-10.4)	11.6 (9.88-14.1)	957
Age group							
20-49 years	11-12	3.66 (3.40-3.93)	3.99 (3.54-4.52)	6.50 (5.79-7.08)	8.61 (7.54-10.8)	11.1 (7.76-11.9)	522
18-49 years	13-14	4.02 (3.61-4.48)	4.19 (3.72-4.92)	7.05 (6.23-8.15)	9.54 (9.00-10.6)	11.7 (9.72-14.8)	583
50 years and older	11-12	3.86 (3.44-4.33)	4.03 (3.27-4.61)	6.28 (5.53-6.63)	8.86 (7.52-10.8)	11.2 (8.86-11.5)	354
	13-14	3.87 (3.55-4.22)	3.99 (3.42-4.54)	6.71 (5.72-7.60)	10.2 (8.36-11.4)	11.6 (9.88-14.0)	374
Gender							
Males	11-12	3.94 (3.61-4.30)	4.53 (3.58-5.11)	6.93 (6.34-7.18)	8.51 (7.71-10.6)	11.2 (8.21-11.9)	527
	13-14	4.01 (3.64-4.42)	4.18 (3.97-4.79)	6.71 (6.17-7.34)	9.10 (8.48-9.89)	10.6 (9.54-11.6)	512
Females	11-12	3.49 (3.03-4.02)	3.79 (3.20-4.03)	5.77 (4.62-6.64)	9.20 (6.63-11.1)	11.1 (7.19-16.0)	349
	13-14	3.93 (3.46-4.46)	4.04 (3.34-4.78)	7.19 (6.33-8.58)	10.6 (9.25-11.9)	12.8 (9.88-14.9)	445
Nonsmokers†							
Total	11-12	3.85 (3.63-4.09)	4.11 (3.89-4.42)	6.26 (5.86-6.84)	9.08 (8.48-9.44)	10.5 (9.58-11.6)	1342
	13-14	3.86 (3.66-4.07)	4.09 (3.85-4.36)	6.39 (6.11-6.76)	8.96 (8.23-9.70)	10.9 (10.0-11.7)	1487
Age group							
20-49 years	11-12	3.65 (3.34-4.00)	3.97 (3.68-4.34)	6.24 (5.58-6.95)	9.08 (7.97-9.27)	9.94 (9.48-11.2)	671
18-49 years	13-14	3.85 (3.69-4.02)	4.13 (3.77-4.47)	6.41 (6.11-6.81)	8.74 (8.06-9.64)	10.2 (9.64-11.6)	778
50 years and older	11-12	4.08 (3.80-4.38)	4.28 (3.91-4.59)	6.29 (5.76-7.08)	9.10 (8.06-10.2)	10.6 (9.44-13.8)	671
	13-14	3.86 (3.50-4.26)	3.99 (3.54-4.47)	6.38 (5.80-7.08)	9.14 (7.67-10.4)	11.3 (9.22-13.5)	709
Gender							
Males	11-12	4.40 (4.14-4.67)	4.71 (4.28-5.17)	6.63 (6.13-7.15)	9.18 (8.15-9.88)	10.7 (9.74-12.8)	634
	13-14	4.20 (3.88-4.55)	4.53 (4.10-4.97)	6.83 (6.39-7.39)	9.36 (8.42-10.2)	11.1 (9.36-13.5)	663
Females	11-12	3.48 (3.22-3.75)	3.69 (3.46-3.90)	5.91 (5.33-6.62)	8.62 (7.79-9.48)	10.2 (9.48-11.5)	708
	13-14	3.60 (3.37-3.84)	3.67 (3.39-4.12)	6.09 (5.61-6.49)	8.33 (7.78-9.27)	10.7 (9.81-11.5)	824

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.12 and 0.086, respectively.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Cesium_BiomonitoringSummary.html

Urinary Cesium (creatinine corrected) (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	4.11 (3.77-4.47)	4.00 (3.69-4.36)	5.55 (5.22-5.70)	8.18 (6.39-10.7)	10.9 (7.48-14.4)	876
	13-14	4.06 (3.81-4.33)	3.88 (3.60-4.31)	5.61 (5.17-6.03)	8.01 (7.13-8.59)	9.03 (8.57-10.3)	956
Age group							
20-49 years	11-12	3.79 (3.44-4.18)	3.69 (3.20-4.15)	5.29 (4.57-5.70)	7.76 (5.72-10.2)	9.27 (7.48-14.4)	522
18-49 years	13-14	3.77 (3.50-4.06)	3.62 (3.26-4.04)	4.97 (4.66-5.37)	6.98 (6.17-8.01)	8.37 (7.13-10.1)	582
50 years and older	11-12	4.65 (4.31-5.03)	4.51 (4.10-4.91)	6.10 (5.47-6.96)	9.36 (7.01-11.5)	11.5 (7.41-32.4)	354
	13-14	4.75 (4.33-5.21)	4.64 (4.12-5.44)	7.00 (5.85-7.99)	8.67 (8.38-9.11)	9.95 (8.89-11.8)	374
Gender							
Males	11-12	3.72 (3.37-4.10)	3.68 (3.20-4.15)	4.88 (4.43-5.41)	6.27 (5.59-7.91)	8.00 (6.10-14.4)	527
	13-14	3.56 (3.29-3.85)	3.52 (3.18-3.82)	4.67 (4.36-4.92)	6.24 (5.56-7.07)	7.99 (6.64-8.91)	511
Females	11-12	4.66 (4.22-5.14)	4.53 (4.13-5.10)	6.95 (5.65-7.89)	9.27 (7.77-11.5)	11.5 (8.29-14.6)	349
	13-14	4.64 (4.33-4.97)	4.58 (3.99-5.07)	6.65 (5.66-7.75)	8.67 (8.00-9.89)	10.3 (8.71-12.5)	445
Nonsmokers†							
Total	11-12	4.49 (4.24-4.76)	4.44 (4.20-4.75)	6.25 (5.71-6.77)	8.25 (7.65-8.86)	10.2 (8.73-11.9)	1341
	13-14	4.61 (4.43-4.79)	4.49 (4.29-4.78)	6.30 (6.13-6.58)	8.48 (8.18-8.96)	10.4 (9.66-10.8)	1486
Age group							
20-49 years	11-12	3.99 (3.80-4.18)	4.00 (3.70-4.27)	5.59 (5.05-5.91)	7.01 (6.45-7.54)	8.19 (7.65-8.75)	670
18-49 years	13-14	4.22 (4.00-4.45)	4.12 (3.79-4.37)	5.73 (5.34-6.14)	7.84 (6.89-8.34)	9.47 (8.26-11.0)	778
50 years and older	11-12	5.10 (4.62-5.63)	4.88 (4.35-5.61)	7.19 (5.91-8.22)	9.48 (8.25-10.7)	12.1 (10.2-13.5)	671
	13-14	5.09 (4.79-5.40)	5.01 (4.78-5.49)	6.93 (6.46-7.55)	9.39 (8.38-10.2)	10.7 (9.98-12.0)	708
Gender							
Males	11-12	3.92 (3.61-4.26)	3.78 (3.54-4.27)	5.36 (4.79-6.24)	7.86 (6.47-8.52)	8.65 (8.01-10.3)	633
	13-14	4.06 (3.87-4.27)	4.02 (3.78-4.29)	5.28 (5.00-5.71)	6.98 (6.42-8.00)	8.50 (7.85-9.06)	662
Females	11-12	4.99 (4.75-5.25)	4.96 (4.72-5.20)	6.62 (6.25-7.17)	8.70 (8.10-9.98)	11.9 (9.48-13.5)	708
	13-14	5.11 (4.91-5.31)	5.15 (4.87-5.38)	7.05 (6.64-7.56)	9.51 (8.66-10.5)	11.3 (10.5-12.5)	824

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Cesium_BiomonitoringSummary.html

Urinary Cobalt (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	.309 (.282-.339)	.309 (.281-.338)	.518 (.457-.573)	.880 (.735-.966)	1.19 (.942-1.50)	875
	13-14	.409 (.365-.460)	.435 (.373-.500)	.710 (.667-.764)	1.07 (.970-1.19)	1.43 (1.30-1.70)	957
Age group							
20-49 years	11-12	.313 (.283-.347)	.315 (.281-.344)	.520 (.433-.619)	.904 (.690-1.05)	1.29 (.912-1.81)	521
18-49 years	13-14	.427 (.380-.481)	.463 (.422-.534)	.726 (.670-.800)	1.13 (.970-1.25)	1.48 (1.25-1.78)	583
50 years and older	11-12	.302 (.268-.341)	.296 (.251-.374)	.518 (.448-.603)	.840 (.661-1.00)	1.03 (.857-1.36)	354
	13-14	.375 (.318-.441)	.364 (.281-.462)	.652 (.488-.779)	1.02 (.779-1.28)	1.38 (1.06-2.39)	374
Gender							
Males	11-12	.293 (.262-.329)	.300 (.263-.338)	.516 (.425-.566)	.688 (.603-.885)	.904 (.744-.966)	526
	13-14	.386 (.362-.411)	.442 (.391-.472)	.663 (.594-.700)	.827 (.798-.904)	1.03 (.922-1.31)	512
Females	11-12	.330 (.300-.362)	.321 (.258-.351)	.556 (.456-.681)	1.14 (.822-1.40)	1.50 (1.17-2.02)	349
	13-14	.435 (.360-.526)	.431 (.331-.554)	.811 (.665-1.00)	1.29 (1.13-1.50)	1.78 (1.39-2.28)	445
Nonsmokers†							
Total	11-12	.305 (.284-.328)	.300 (.284-.323)	.482 (.456-.515)	.815 (.702-.998)	1.23 (1.03-1.56)	1343
	13-14	.368 (.349-.387)	.375 (.355-.404)	.640 (.604-.667)	.925 (.868-1.05)	1.24 (1.17-1.39)	1487
Age group							
20-49 years	11-12	.316 (.293-.341)	.328 (.295-.360)	.535 (.476-.596)	.883 (.736-1.06)	1.35 (1.00-1.61)	671
18-49 years	13-14	.379 (.343-.418)	.406 (.357-.460)	.673 (.637-.747)	1.03 (.901-1.11)	1.32 (1.17-1.44)	778
50 years and older	11-12	.294 (.269-.322)	.284 (.265-.306)	.447 (.401-.482)	.729 (.588-.986)	1.16 (.810-1.62)	672
	13-14	.356 (.337-.376)	.353 (.329-.373)	.584 (.517-.647)	.873 (.741-.977)	1.23 (.900-2.13)	709
Gender							
Males	11-12	.295 (.274-.318)	.292 (.277-.320)	.420 (.372-.475)	.656 (.541-.729)	.813 (.721-.982)	635
	13-14	.360 (.335-.387)	.376 (.340-.421)	.604 (.549-.645)	.820 (.765-.891)	1.06 (.873-1.24)	663
Females	11-12	.313 (.282-.348)	.311 (.279-.360)	.542 (.482-.600)	1.06 (.754-1.32)	1.53 (1.16-1.82)	708
	13-14	.374 (.342-.410)	.374 (.340-.414)	.671 (.637-.717)	1.10 (.926-1.21)	1.40 (1.23-1.63)	824

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.048 and 0.023, respectively.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Cobalt_BiomonitoringSummary.html

Urinary Cobalt (creatinine corrected) (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	.338 (.309-.370)	.327 (.289-.345)	.498 (.470-.514)	.756 (.688-.823)	1.16 (.875-1.50)	875
	13-14	.419 (.385-.456)	.408 (.372-.441)	.605 (.548-.661)	.932 (.845-1.00)	1.23 (1.06-1.48)	956
Age group							
20-49 years	11-12	.322 (.285-.365)	.295 (.259-.339)	.474 (.442-.513)	.767 (.694-.919)	1.28 (.782-1.96)	521
18-49 years	13-14	.401 (.369-.435)	.403 (.355-.427)	.560 (.516-.636)	.880 (.749-1.00)	1.16 (.948-1.32)	582
50 years and older	11-12	.365 (.338-.394)	.336 (.329-.378)	.508 (.481-.573)	.688 (.622-.880)	1.04 (.800-1.50)	354
	13-14	.460 (.402-.527)	.436 (.367-.516)	.677 (.611-.759)	1.03 (.856-1.29)	1.53 (1.12-1.98)	374
Gender							
Males	11-12	.274 (.253-.297)	.265 (.235-.300)	.400 (.336-.465)	.546 (.493-.622)	.622 (.513-.751)	526
	13-14	.342 (.309-.379)	.347 (.321-.382)	.448 (.414-.513)	.630 (.559-.677)	.739 (.643-.986)	511
Females	11-12	.440 (.375-.516)	.417 (.337-.490)	.648 (.572-.729)	1.13 (.799-1.56)	1.88 (1.03-2.51)	349
	13-14	.513 (.457-.576)	.509 (.433-.589)	.755 (.695-.855)	1.19 (1.00-1.24)	1.53 (1.23-1.73)	445
Nonsmokers†							
Total	11-12	.356 (.338-.375)	.333 (.304-.350)	.517 (.469-.569)	.865 (.713-1.10)	1.30 (1.10-1.58)	1342
	13-14	.439 (.420-.458)	.425 (.392-.446)	.623 (.580-.683)	.961 (.885-1.06)	1.32 (1.19-1.60)	1486
Age group							
20-49 years	11-12	.345 (.322-.370)	.317 (.282-.349)	.520 (.463-.569)	.962 (.750-1.12)	1.27 (1.10-1.58)	670
18-49 years	13-14	.415 (.394-.436)	.397 (.377-.431)	.590 (.561-.638)	.904 (.827-.965)	1.10 (.971-1.29)	778
50 years and older	11-12	.368 (.338-.401)	.345 (.304-.390)	.514 (.451-.593)	.786 (.604-1.17)	1.41 (.871-2.13)	672
	13-14	.468 (.437-.500)	.443 (.405-.480)	.683 (.588-.743)	1.17 (.864-1.41)	1.50 (1.25-2.09)	708
Gender							
Males	11-12	.263 (.246-.282)	.242 (.228-.260)	.353 (.320-.391)	.511 (.432-.625)	.665 (.514-1.03)	634
	13-14	.348 (.326-.371)	.333 (.314-.351)	.471 (.431-.508)	.678 (.593-.739)	.884 (.683-1.41)	662
Females	11-12	.450 (.419-.485)	.423 (.400-.457)	.638 (.594-.710)	1.10 (.957-1.30)	1.58 (1.18-2.24)	708
	13-14	.531 (.497-.568)	.519 (.476-.554)	.767 (.698-.829)	1.17 (.980-1.31)	1.50 (1.25-2.00)	824

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Cobalt_BiomonitoringSummary.html

Urinary Lead (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	.475 (.398-.565)	.440 (.390-.560)	.870 (.740-1.02)	1.54 (1.15-2.01)	2.36 (1.71-4.62)	876
	13-14	.382 (.344-.425)	.390 (.340-.460)	.690 (.610-.820)	1.17 (1.02-1.30)	1.51 (1.30-1.91)	957
Age group							
20-49 years	11-12	.422 (.350-.509)	.400 (.330-.550)	.790 (.660-.990)	1.20 (1.05-1.66)	1.78 (1.41-3.07)	522
18-49 years	13-14	.348 (.303-.400)	.360 (.300-.440)	.610 (.520-.690)	1.02 (.890-1.16)	1.34 (1.13-1.92)	583
50 years and older	11-12	.570 (.452-.718)	.500 (.430-.700)	1.01 (.740-1.36)	1.92 (1.36-2.97)	3.35 (1.62-6.83)	354
	13-14	.466 (.401-.542)	.470 (.390-.570)	.920 (.710-1.13)	1.36 (1.25-1.43)	1.72 (1.40-2.03)	374
Gender							
Males	11-12	.583 (.476-.714)	.630 (.450-.750)	1.01 (.850-1.20)	1.80 (1.46-2.60)	3.07 (1.73-5.03)	527
	13-14	.442 (.390-.500)	.460 (.390-.550)	.820 (.680-.990)	1.23 (1.17-1.52)	1.91 (1.48-2.14)	512
Females	11-12	.366 (.309-.434)	.350 (.280-.410)	.640 (.500-.750)	1.15 (.750-1.47)	1.58 (1.14-3.45)	349
	13-14	.331 (.291-.376)	.340 (.310-.370)	.570 (.460-.690)	1.01 (.830-1.24)	1.30 (1.12-1.41)	445
Nonsmokers†							
Total	11-12	.360 (.331-.392)	.380 (.340-.400)	.650 (.580-.710)	1.02 (.890-1.21)	1.38 (1.25-1.58)	1343
	13-14	.272 (.257-.288)	.280 (.270-.290)	.500 (.470-.530)	.790 (.720-.900)	1.16 (.950-1.51)	1487
Age group							
20-49 years	11-12	.300 (.265-.339)	.300 (.260-.360)	.560 (.490-.650)	.950 (.770-1.15)	1.26 (1.02-1.38)	671
18-49 years	13-14	.222 (.202-.244)	.230 (.210-.260)	.410 (.360-.480)	.650 (.600-.730)	.880 (.720-1.04)	778
50 years and older	11-12	.439 (.394-.489)	.440 (.390-.480)	.720 (.600-.820)	1.11 (.920-1.38)	1.63 (1.29-2.16)	672
	13-14	.340 (.315-.366)	.340 (.320-.370)	.590 (.520-.670)	1.00 (.790-1.25)	1.48 (1.12-2.52)	709
Gender							
Males	11-12	.417 (.374-.465)	.420 (.380-.450)	.700 (.600-.790)	1.11 (.900-1.38)	1.61 (1.18-2.13)	635
	13-14	.320 (.296-.345)	.320 (.290-.350)	.580 (.520-.630)	.960 (.740-1.25)	1.51 (1.04-2.68)	663
Females	11-12	.321 (.288-.359)	.320 (.300-.380)	.590 (.500-.680)	.960 (.820-1.15)	1.32 (1.06-1.38)	708
	13-14	.237 (.219-.257)	.240 (.220-.270)	.450 (.410-.480)	.700 (.630-.770)	.950 (.790-1.15)	824

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.08 and 0.03, respectively.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Lead_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Lead_FactSheet.html

Urinary Lead (creatinine corrected) (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	.522 (.463-.588)	.495 (.438-.542)	.800 (.684-.935)	1.23 (1.08-1.51)	1.93 (1.25-3.70)	876
	13-14	.391 (.358-.428)	.375 (.334-.419)	.631 (.563-.704)	.955 (.837-1.06)	1.26 (1.08-1.50)	956
Age group							
20-49 years	11-12	.438 (.385-.498)	.400 (.373-.436)	.640 (.538-.789)	1.10 (.833-1.31)	1.72 (1.12-3.50)	522
18-49 years	13-14	.327 (.298-.359)	.317 (.284-.340)	.468 (.426-.563)	.775 (.667-.862)	1.04 (.837-1.26)	582
50 years and older	11-12	.687 (.586-.805)	.664 (.559-.750)	.956 (.808-1.21)	1.51 (1.14-2.19)	2.15 (1.23-4.53)	354
	13-14	.572 (.508-.644)	.575 (.500-.647)	.833 (.742-.977)	1.15 (1.04-1.62)	1.85 (1.33-2.20)	374
Gender							
Males	11-12	.550 (.491-.616)	.496 (.430-.602)	.833 (.717-1.03)	1.47 (1.12-1.93)	2.19 (1.72-3.70)	527
	13-14	.392 (.358-.430)	.373 (.330-.409)	.623 (.527-.697)	.983 (.821-1.05)	1.33 (1.06-1.66)	511
Females	11-12	.488 (.413-.578)	.493 (.410-.542)	.714 (.590-.864)	1.14 (.867-1.34)	1.34 (1.10-4.00)	349
	13-14	.391 (.341-.447)	.376 (.333-.448)	.634 (.562-.756)	.955 (.775-1.25)	1.22 (1.01-1.54)	445
Nonsmokers†							
Total	11-12	.421 (.391-.453)	.408 (.388-.431)	.653 (.589-.706)	.944 (.848-1.14)	1.46 (1.22-1.64)	1342
	13-14	.324 (.311-.339)	.317 (.303-.330)	.529 (.500-.558)	.833 (.750-.917)	1.18 (1.00-1.35)	1486
Age group							
20-49 years	11-12	.328 (.292-.369)	.316 (.273-.368)	.510 (.447-.575)	.750 (.654-.916)	.944 (.851-1.17)	670
18-49 years	13-14	.243 (.222-.267)	.229 (.202-.255)	.381 (.340-.417)	.609 (.486-.732)	.828 (.647-1.11)	778
50 years and older	11-12	.548 (.494-.608)	.500 (.437-.583)	.760 (.701-.814)	1.29 (1.06-1.62)	1.77 (1.48-2.12)	672
	13-14	.448 (.424-.475)	.447 (.395-.477)	.650 (.578-.750)	1.00 (.906-1.23)	1.47 (1.20-1.82)	708
Gender							
Males	11-12	.374 (.329-.425)	.364 (.319-.425)	.543 (.488-.622)	.835 (.704-1.13)	1.26 (.965-1.65)	634
	13-14	.310 (.286-.336)	.302 (.269-.324)	.483 (.431-.529)	.741 (.612-1.00)	1.18 (.828-1.76)	662
Females	11-12	.462 (.421-.505)	.441 (.400-.510)	.716 (.645-.775)	1.05 (.909-1.29)	1.62 (1.22-1.83)	708
	13-14	.337 (.318-.357)	.333 (.313-.353)	.560 (.519-.617)	.897 (.789-.947)	1.20 (1.00-1.32)	824

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Lead_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Lead_FactSheet.html

Urinary Manganese (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	.123 (.111-.137)	.120 (.100-.150)	.200 (.180-.220)	.300 (.260-.360)	.410 (.290-.630)	876
	13-14	*	< LOD	.130 (<LOD-.150)	.220 (.200-.250)	.300 (.260-.390)	957
Age group							
20-49 years	11-12	.135 (.117-.156)	.130 (.110-.160)	.230 (.190-.260)	.350 (.260-.590)	.570 (.290-.660)	522
18-49 years	13-14	*	< LOD	.130 (<LOD-.160)	.230 (.210-.280)	.310 (.260-.460)	583
50 years and older	11-12	.106 (.090-.125)	.100 (.080-.130)	.160 (.120-.210)	.250 (.190-.300)	.300 (.250-.360)	354
	13-14	*	< LOD	< LOD	.200 (.150-.250)	.270 (.210-.310)	374
Gender							
Males	11-12	.116 (.099-.134)	.110 (.080-.150)	.190 (.160-.220)	.290 (.230-.350)	.370 (.270-.570)	527
	13-14	*	< LOD	< LOD	.210 (.140-.240)	.260 (.210-.310)	512
Females	11-12	.133 (.117-.152)	.130 (.110-.150)	.220 (.170-.270)	.310 (.250-.630)	.600 (.270-.920)	349
	13-14	*	< LOD	.140 (.130-.160)	.250 (.210-.290)	.350 (.280-.710)	445
Nonsmokers†							
Total	11-12	.122 (.110-.134)	.120 (.100-.140)	.190 (.170-.220)	.280 (.250-.300)	.350 (.300-.400)	1343
	13-14	*	< LOD	.130 (<LOD-.140)	.200 (.180-.230)	.280 (.240-.330)	1487
Age group							
20-49 years	11-12	.120 (.106-.136)	.110 (.100-.140)	.190 (.170-.220)	.280 (.250-.300)	.360 (.300-.440)	671
18-49 years	13-14	*	< LOD	.130 (<LOD-.140)	.190 (.170-.220)	.250 (.210-.320)	778
50 years and older	11-12	.123 (.111-.136)	.130 (.100-.150)	.190 (.170-.220)	.270 (.240-.300)	.340 (.290-.400)	672
	13-14	*	< LOD	.130 (<LOD-.150)	.220 (.180-.260)	.310 (.240-.400)	709
Gender							
Males	11-12	.121 (.109-.134)	.120 (.100-.140)	.190 (.170-.210)	.260 (.240-.290)	.330 (.290-.370)	635
	13-14	*	< LOD	< LOD	.180 (.150-.210)	.230 (.200-.260)	663
Females	11-12	.122 (.109-.137)	.120 (.100-.140)	.200 (.170-.230)	.280 (.250-.300)	.360 (.300-.470)	708
	13-14	*	< LOD	.140 (<LOD-.160)	.230 (.190-.280)	.330 (.260-.450)	824

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.08 and 0.13, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary Manganese (creatinine corrected) (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	.135 (.118-.155)	.127 (.114-.144)	.238 (.197-.286)	.380 (.333-.413)	.485 (.423-.587)	876
	13-14	*	< LOD	.192 (<LOD-.204)	.317 (.263-.400)	.483 (.329-.708)	956
Age group							
20-49 years	11-12	.140 (.116-.168)	.131 (.106-.158)	.267 (.211-.315)	.406 (.335-.473)	.556 (.419-1.00)	522
18-49 years	13-14	*	< LOD	.184 (<LOD-.196)	.288 (.244-.333)	.418 (.317-.657)	582
50 years and older	11-12	.128 (.113-.146)	.127 (.106-.150)	.211 (.175-.286)	.317 (.271-.387)	.415 (.333-.583)	354
	13-14	*	< LOD	< LOD	.400 (.230-.816)	.541 (.387-.900)	374
Gender							
Males	11-12	.109 (.093-.128)	.104 (.090-.123)	.188 (.150-.218)	.318 (.241-.335)	.385 (.335-.423)	527
	13-14	*	< LOD	< LOD	.236 (.196-.297)	.326 (.279-.368)	511
Females	11-12	.178 (.152-.208)	.180 (.136-.219)	.292 (.227-.380)	.469 (.388-.587)	.740 (.473-1.12)	349
	13-14	*	< LOD	.230 (.196-.271)	.400 (.279-.708)	.642 (.400-.836)	445
Nonsmokers†							
Total	11-12	.142 (.128-.157)	.138 (.119-.154)	.238 (.200-.283)	.426 (.374-.518)	.571 (.526-.625)	1342
	13-14	*	< LOD	.219 (<LOD-.244)	.368 (.329-.434)	.541 (.438-.657)	1486
Age group							
20-49 years	11-12	.131 (.117-.147)	.130 (.110-.145)	.213 (.186-.254)	.407 (.345-.529)	.625 (.444-1.06)	670
18-49 years	13-14	*	< LOD	.196 (<LOD-.219)	.317 (.279-.393)	.434 (.358-.541)	778
50 years and older	11-12	.154 (.137-.173)	.144 (.127-.167)	.259 (.209-.318)	.441 (.374-.518)	.550 (.500-.605)	672
	13-14	*	< LOD	.256 (<LOD-.286)	.484 (.333-.564)	.657 (.507-.905)	708
Gender							
Males	11-12	.108 (.095-.123)	.108 (.093-.119)	.172 (.157-.185)	.308 (.218-.379)	.385 (.341-.529)	634
	13-14	*	< LOD	< LOD	.253 (.224-.271)	.317 (.279-.434)	662
Females	11-12	.175 (.157-.196)	.160 (.143-.197)	.295 (.254-.342)	.519 (.426-.597)	.667 (.571-1.21)	708
	13-14	*	< LOD	.279 (<LOD-.317)	.484 (.383-.541)	.640 (.511-.836)	824

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
 < LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary Molybdenum (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	32.6 (28.8-37.1)	36.0 (30.7-39.8)	67.2 (57.4-76.9)	105 (86.0-126)	140 (117-157)	876
	13-14	30.5 (27.3-34.1)	33.5 (26.7-39.5)	61.8 (54.8-70.6)	102 (86.2-113)	125 (107-145)	957
Age group							
20-49 years	11-12	35.5 (30.9-40.7)	37.9 (30.2-46.1)	71.0 (57.6-83.6)	108 (83.6-136)	134 (113-145)	522
18-49 years	13-14	33.0 (29.0-37.5)	36.7 (30.9-44.6)	65.7 (59.1-75.9)	108 (85.8-126)	127 (113-157)	583
50 years and older	11-12	28.6 (24.2-33.9)	32.1 (23.0-39.7)	60.9 (52.2-72.6)	101 (78.8-137)	141 (95.2-184)	354
	13-14	25.9 (22.2-30.3)	26.2 (22.4-34.7)	50.1 (42.1-57.4)	80.8 (70.4-96.7)	107 (92.9-122)	374
Gender							
Males	11-12	36.3 (30.9-42.6)	38.6 (29.6-46.1)	74.0 (59.7-88.1)	111 (85.2-141)	141 (120-160)	527
	13-14	35.5 (32.8-38.3)	39.4 (34.8-44.0)	67.0 (58.2-75.4)	107 (86.5-116)	119 (111-144)	512
Females	11-12	28.6 (24.0-34.0)	31.8 (26.8-37.9)	57.4 (46.2-70.2)	90.6 (76.8-112)	132 (96.5-175)	349
	13-14	26.3 (21.7-31.9)	26.1 (20.7-36.6)	58.3 (46.1-69.1)	95.8 (73.9-121)	126 (80.7-173)	445
Nonsmokers†							
Total	11-12	34.7 (32.4-37.2)	37.6 (34.3-40.5)	63.4 (59.6-68.5)	99.8 (93.1-108)	134 (115-144)	1343
	13-14	31.2 (28.4-34.2)	32.7 (28.4-36.2)	62.7 (55.4-68.5)	94.8 (88.1-101)	128 (113-131)	1487
Age group							
20-49 years	11-12	35.4 (31.4-40.0)	40.8 (36.9-45.3)	66.5 (61.1-75.9)	103 (92.9-115)	134 (113-150)	671
18-49 years	13-14	32.0 (28.7-35.8)	33.9 (28.8-40.5)	65.2 (57.5-71.6)	94.2 (88.1-104)	125 (108-132)	778
50 years and older	11-12	34.0 (31.7-36.4)	34.2 (31.7-38.8)	57.7 (54.0-64.5)	97.4 (81.6-108)	135 (109-144)	672
	13-14	30.3 (27.1-33.8)	29.8 (25.4-35.3)	57.1 (48.0-67.9)	95.2 (80.5-109)	129 (113-152)	709
Gender							
Males	11-12	41.5 (38.2-44.9)	44.5 (40.0-51.0)	69.6 (63.7-75.2)	106 (97.4-124)	138 (108-150)	635
	13-14	36.1 (32.6-40.0)	38.1 (33.9-43.7)	72.0 (61.8-79.2)	104 (95.2-116)	138 (114-181)	663
Females	11-12	30.2 (27.1-33.6)	31.6 (28.1-35.3)	58.4 (50.0-64.9)	89.9 (80.6-103)	123 (107-156)	708
	13-14	27.6 (25.1-30.4)	28.5 (24.6-32.9)	54.1 (47.0-62.6)	82.8 (77.1-88.8)	112 (96.3-129)	824

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.99 and 0.8, respectively.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Molybdenum_BiomonitoringSummary.html

Urinary Molybdenum (creatinine corrected) (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	35.9 (34.0-37.9)	36.4 (33.4-38.8)	55.3 (52.6-57.9)	79.6 (73.4-89.5)	104 (91.2-110)	876
	13-14	31.2 (28.8-33.9)	32.2 (29.1-36.3)	49.1 (42.6-54.9)	66.4 (60.8-74.5)	82.3 (74.5-96.7)	956
Age group							
20-49 years	11-12	36.8 (33.8-40.0)	36.4 (32.8-40.5)	53.4 (49.3-57.9)	79.6 (69.2-91.5)	96.0 (89.5-108)	522
18-49 years	13-14	31.0 (27.9-34.3)	32.6 (28.3-38.0)	49.1 (42.6-54.9)	63.7 (58.2-75.4)	79.2 (66.5-94.7)	582
50 years and older	11-12	34.5 (31.0-38.5)	35.3 (30.0-43.1)	57.0 (52.6-63.5)	80.7 (71.0-108)	108 (87.1-128)	354
	13-14	31.8 (29.1-34.9)	32.1 (28.8-34.5)	49.9 (41.3-58.2)	69.5 (61.5-80.2)	95.1 (69.1-123)	374
Gender							
Males	11-12	34.2 (30.9-37.9)	35.6 (32.7-40.5)	55.5 (48.9-58.5)	73.4 (64.6-79.1)	83.1 (76.1-92.5)	527
	13-14	31.5 (28.8-34.4)	32.2 (29.6-37.5)	46.4 (42.6-52.8)	63.6 (58.4-69.3)	75.4 (63.7-84.2)	511
Females	11-12	38.1 (35.2-41.3)	36.4 (33.0-38.6)	53.5 (51.7-61.1)	96.0 (74.1-108)	119 (96.0-157)	349
	13-14	31.0 (27.5-34.9)	32.5 (27.4-37.0)	50.0 (42.0-58.2)	74.2 (60.5-86.1)	94.7 (71.4-109)	445
Nonsmokers†							
Total	11-12	40.5 (38.8-42.2)	39.5 (37.3-43.4)	60.9 (57.2-63.6)	85.5 (79.9-91.6)	118 (99.1-142)	1342
	13-14	37.2 (34.8-39.8)	37.6 (36.0-39.4)	55.7 (51.1-59.4)	82.7 (74.7-86.6)	105 (93.6-116)	1486
Age group							
20-49 years	11-12	38.7 (36.8-40.6)	37.7 (35.2-41.7)	57.9 (52.8-62.1)	77.5 (71.6-85.0)	111 (87.1-148)	670
18-49 years	13-14	35.1 (32.6-37.7)	36.4 (34.6-37.8)	51.3 (48.1-54.3)	71.6 (65.2-76.3)	83.8 (78.4-91.2)	778
50 years and older	11-12	42.5 (39.5-45.7)	41.6 (37.3-46.3)	62.9 (56.2-71.6)	91.9 (85.5-104)	118 (103-148)	672
	13-14	39.7 (36.5-43.3)	40.1 (36.6-43.5)	59.0 (56.5-67.8)	91.0 (83.8-102)	122 (107-134)	708
Gender							
Males	11-12	37.0 (33.9-40.4)	36.8 (33.3-42.8)	52.4 (48.8-59.5)	80.6 (69.6-86.7)	88.8 (84.9-114)	634
	13-14	34.9 (31.7-38.3)	36.0 (31.2-39.3)	52.8 (48.1-57.8)	79.7 (68.6-88.2)	102 (86.9-122)	662
Females	11-12	43.4 (40.5-46.6)	42.1 (38.5-45.4)	65.2 (61.2-69.6)	95.1 (84.4-105)	148 (104-167)	708
	13-14	39.2 (37.0-41.7)	39.3 (37.5-40.7)	57.7 (52.7-62.0)	83.6 (75.0-88.4)	107 (93.6-123)	824

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Molybdenum_BiomonitoringSummary.html

Urinary Strontium (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	89.8 (77.9-103)	94.5 (77.7-114)	175 (142-209)	271 (250-309)	342 (315-377)	874
	13-14	89.4 (80.6-99.2)	99.9 (90.2-112)	166 (153-181)	264 (222-315)	343 (292-390)	957
Age group							
20-49 years	11-12	93.3 (82.0-106)	93.2 (80.9-104)	191 (150-220)	277 (245-320)	355 (288-396)	522
18-49 years	13-14	95.8 (84.8-108)	108 (94.3-126)	180 (157-202)	276 (222-327)	348 (294-395)	583
50 years and older	11-12	84.5 (69.1-103)	96.6 (67.0-123)	159 (129-184)	255 (200-309)	338 (307-401)	352
	13-14	77.3 (65.6-91.0)	80.3 (63.4-101)	143 (125-149)	229 (168-289)	315 (252-479)	374
Gender							
Males	11-12	100 (85.1-118)	110 (91.4-125)	185 (155-227)	306 (267-329)	365 (312-396)	526
	13-14	96.7 (87.0-107)	107 (94.3-124)	184 (156-209)	271 (222-323)	324 (271-395)	512
Females	11-12	78.3 (65.4-93.8)	77.7 (65.3-101)	150 (110-203)	249 (184-318)	318 (231-525)	348
	13-14	82.6 (72.5-94.2)	90.7 (76.8-106)	151 (139-163)	246 (201-348)	360 (267-479)	445
Nonsmokers†							
Total	11-12	82.2 (76.2-88.6)	83.3 (77.0-92.0)	156 (151-166)	234 (211-252)	302 (265-353)	1342
	13-14	78.7 (75.1-82.4)	83.0 (78.7-88.3)	138 (129-149)	219 (198-237)	282 (256-315)	1487
Age group							
20-49 years	11-12	85.0 (78.0-92.6)	90.4 (79.9-106)	172 (155-190)	246 (219-265)	293 (265-327)	671
18-49 years	13-14	83.4 (75.9-91.7)	91.0 (82.1-96.5)	151 (131-176)	231 (216-254)	297 (253-363)	778
50 years and older	11-12	79.3 (72.2-87.1)	77.8 (66.7-89.0)	146 (130-156)	217 (179-276)	325 (234-379)	671
	13-14	73.7 (67.7-80.2)	77.1 (69.4-83.4)	124 (118-131)	195 (180-216)	269 (234-303)	709
Gender							
Males	11-12	92.5 (81.8-105)	97.6 (85.4-108)	160 (141-184)	247 (194-292)	302 (252-379)	634
	13-14	86.5 (79.9-93.6)	92.4 (84.2-97.8)	144 (129-176)	220 (193-254)	298 (244-341)	663
Females	11-12	74.9 (69.1-81.3)	77.0 (66.1-82.2)	153 (139-167)	230 (204-265)	294 (264-346)	708
	13-14	72.7 (67.9-77.9)	75.9 (69.3-81.1)	131 (120-143)	216 (186-239)	269 (235-321)	824

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 2.5 and 2.34, respectively.

Urinary Strontium (creatinine corrected) (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	98.7 (86.5-112)	97.8 (82.5-117)	168 (140-192)	250 (207-314)	356 (258-481)	874
	13-14	91.5 (82.1-102)	99.1 (89.3-107)	150 (136-170)	213 (189-235)	266 (217-365)	956
Age group							
20-49 years	11-12	96.7 (85.4-109)	95.3 (82.1-115)	162 (136-187)	236 (204-275)	305 (241-427)	522
18-49 years	13-14	89.8 (79.7-101)	96.8 (85.2-106)	145 (132-162)	208 (183-225)	255 (200-393)	582
50 years and older	11-12	102 (86.3-120)	107 (78.1-117)	175 (140-197)	279 (197-398)	398 (190-811)	352
	13-14	95.0 (77.4-117)	105 (87.4-126)	161 (138-179)	232 (192-287)	297 (235-365)	374
Gender							
Males	11-12	94.4 (83.9-106)	95.4 (79.0-113)	146 (131-171)	222 (185-260)	314 (226-375)	526
	13-14	85.8 (75.1-98.0)	94.2 (83.6-105)	144 (128-161)	195 (174-222)	253 (193-365)	511
Females	11-12	104 (79.2-137)	101 (78.1-143)	187 (123-246)	275 (180-706)	434 (211-939)	348
	13-14	97.5 (86.0-111)	105 (92.3-112)	156 (136-180)	226 (193-266)	297 (233-375)	445
Nonsmokers†							
Total	11-12	95.7 (89.6-102)	99.7 (92.5-109)	150 (140-164)	235 (214-255)	318 (277-346)	1341
	13-14	94.0 (89.2-99.0)	100 (92.7-105)	146 (139-154)	218 (191-243)	288 (255-324)	1486
Age group							
20-49 years	11-12	92.6 (83.7-102)	101 (85.7-115)	139 (128-154)	219 (183-254)	261 (241-311)	670
18-49 years	13-14	91.3 (84.9-98.2)	94.9 (88.9-103)	138 (131-151)	205 (177-235)	268 (238-297)	778
50 years and older	11-12	99.2 (89.8-110)	98.3 (92.4-113)	164 (145-200)	258 (220-322)	350 (313-372)	671
	13-14	97.1 (88.9-106)	104 (93.9-110)	150 (143-161)	235 (193-286)	302 (253-390)	708
Gender							
Males	11-12	82.3 (74.1-91.4)	88.9 (80.1-92.5)	130 (119-142)	185 (152-227)	233 (195-311)	633
	13-14	83.9 (79.5-88.5)	89.3 (84.7-98.2)	129 (120-140)	176 (162-191)	229 (184-256)	662
Females	11-12	108 (101-115)	113 (100-126)	179 (156-204)	272 (239-315)	346 (305-372)	708
	13-14	103 (95.5-112)	108 (97.5-115)	159 (151-171)	260 (218-298)	336 (294-390)	824

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Urinary Thallium (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	.137 (.126-.149)	.147 (.128-.162)	.230 (.210-.257)	.358 (.282-.419)	.419 (.356-.524)	876
	13-14	.138 (.121-.158)	.150 (.126-.178)	.246 (.220-.273)	.364 (.302-.410)	.435 (.410-.459)	957
Age group							
20-49 years	11-12	.145 (.130-.160)	.160 (.136-.176)	.250 (.213-.308)	.375 (.294-.446)	.440 (.356-.524)	522
18-49 years	13-14	.151 (.132-.173)	.171 (.139-.200)	.267 (.234-.292)	.373 (.316-.429)	.435 (.397-.480)	583
50 years and older	11-12	.126 (.112-.143)	.130 (.112-.157)	.208 (.173-.230)	.303 (.229-.395)	.395 (.256-.535)	354
	13-14	.115 (.100-.133)	.123 (.101-.136)	.196 (.173-.220)	.302 (.258-.408)	.431 (.362-.477)	374
Gender							
Males	11-12	.143 (.128-.161)	.150 (.128-.176)	.230 (.216-.265)	.358 (.266-.473)	.465 (.332-.535)	527
	13-14	.144 (.125-.165)	.160 (.125-.198)	.253 (.226-.274)	.336 (.299-.405)	.424 (.402-.451)	512
Females	11-12	.130 (.111-.152)	.136 (.109-.160)	.231 (.172-.286)	.358 (.236-.440)	.389 (.337-.511)	349
	13-14	.133 (.109-.164)	.139 (.114-.171)	.243 (.192-.301)	.385 (.288-.459)	.459 (.385-.602)	445
Nonsmokers†							
Total	11-12	.147 (.137-.157)	.156 (.142-.168)	.247 (.221-.274)	.346 (.316-.377)	.417 (.372-.521)	1343
	13-14	.138 (.131-.146)	.151 (.138-.161)	.239 (.218-.260)	.338 (.318-.356)	.417 (.389-.438)	1487
Age group							
20-49 years	11-12	.158 (.143-.175)	.173 (.158-.196)	.276 (.247-.318)	.376 (.345-.407)	.438 (.385-.522)	671
18-49 years	13-14	.148 (.138-.159)	.161 (.143-.174)	.254 (.239-.265)	.371 (.340-.395)	.440 (.412-.470)	778
50 years and older	11-12	.135 (.123-.148)	.140 (.125-.153)	.204 (.181-.245)	.292 (.258-.352)	.361 (.298-.545)	672
	13-14	.128 (.120-.137)	.139 (.131-.150)	.213 (.189-.248)	.312 (.270-.340)	.375 (.326-.419)	709
Gender							
Males	11-12	.168 (.153-.185)	.173 (.152-.202)	.269 (.235-.304)	.361 (.324-.385)	.412 (.372-.509)	635
	13-14	.150 (.138-.162)	.162 (.150-.171)	.242 (.222-.269)	.347 (.310-.386)	.438 (.386-.476)	663
Females	11-12	.132 (.121-.143)	.140 (.130-.149)	.230 (.198-.258)	.322 (.290-.376)	.431 (.341-.522)	708
	13-14	.130 (.121-.139)	.138 (.120-.153)	.235 (.204-.254)	.327 (.304-.348)	.398 (.375-.421)	824

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.02 and 0.018, respectively.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Thallium_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Thallium_FactSheet.html

Urinary Thallium (creatinine corrected) (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	.151 (.138-.164)	.153 (.142-.161)	.207 (.184-.227)	.292 (.237-.364)	.365 (.278-.544)	876
	13-14	.142 (.129-.156)	.142 (.133-.152)	.199 (.177-.222)	.280 (.248-.322)	.388 (.297-.410)	956
Age group							
20-49 years	11-12	.150 (.135-.166)	.151 (.140-.166)	.200 (.178-.241)	.286 (.235-.333)	.347 (.286-.587)	522
18-49 years	13-14	.142 (.126-.160)	.140 (.130-.152)	.194 (.174-.219)	.285 (.231-.329)	.392 (.291-.463)	582
50 years and older	11-12	.152 (.138-.168)	.153 (.127-.171)	.222 (.186-.243)	.305 (.228-.416)	.382 (.243-.544)	354
	13-14	.141 (.129-.155)	.142 (.127-.160)	.201 (.181-.236)	.278 (.260-.313)	.373 (.287-.410)	374
Gender							
Males	11-12	.135 (.124-.148)	.134 (.121-.146)	.180 (.159-.207)	.241 (.198-.278)	.278 (.237-.375)	527
	13-14	.127 (.113-.144)	.133 (.121-.142)	.175 (.155-.190)	.248 (.222-.260)	.283 (.260-.394)	511
Females	11-12	.173 (.155-.193)	.171 (.162-.188)	.235 (.201-.294)	.336 (.284-.457)	.457 (.294-.593)	349
	13-14	.157 (.141-.176)	.156 (.140-.174)	.223 (.191-.260)	.313 (.246-.400)	.392 (.296-.482)	445
Nonsmokers†							
Total	11-12	.171 (.159-.184)	.167 (.156-.181)	.237 (.219-.258)	.342 (.312-.376)	.449 (.373-.510)	1342
	13-14	.165 (.158-.173)	.163 (.153-.171)	.241 (.227-.251)	.344 (.327-.359)	.433 (.405-.457)	1486
Age group							
20-49 years	11-12	.172 (.157-.189)	.171 (.156-.189)	.235 (.211-.257)	.333 (.289-.388)	.431 (.333-.665)	670
18-49 years	13-14	.162 (.151-.174)	.159 (.143-.176)	.236 (.220-.253)	.333 (.301-.361)	.418 (.361-.467)	778
50 years and older	11-12	.169 (.153-.187)	.165 (.152-.179)	.238 (.209-.282)	.348 (.300-.425)	.476 (.351-.532)	672
	13-14	.169 (.159-.179)	.165 (.153-.176)	.246 (.224-.264)	.353 (.329-.389)	.436 (.405-.507)	708
Gender							
Males	11-12	.150 (.137-.164)	.151 (.134-.159)	.209 (.180-.233)	.296 (.235-.333)	.333 (.283-.460)	634
	13-14	.145 (.136-.154)	.138 (.130-.145)	.195 (.181-.207)	.291 (.258-.303)	.352 (.307-.404)	662
Females	11-12	.189 (.177-.202)	.186 (.172-.200)	.266 (.240-.289)	.403 (.345-.436)	.482 (.411-.557)	708
	13-14	.184 (.175-.193)	.188 (.174-.198)	.270 (.252-.281)	.389 (.353-.416)	.444 (.430-.482)	824

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Thallium_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Thallium_FactSheet.html

Urinary Tin (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	.580 (.485-.694)	.490 (.400-.600)	1.00 (.800-1.27)	2.50 (1.57-4.09)	4.22 (2.95-6.85)	876
	13-14	.451 (.385-.528)	.410 (.360-.490)	.990 (.770-1.21)	2.20 (1.81-2.65)	4.26 (2.70-5.46)	957
Age group							
20-49 years	11-12	.573 (.466-.705)	.440 (.360-.610)	.980 (.730-1.52)	2.72 (1.62-4.22)	4.53 (2.95-9.52)	522
18-49 years	13-14	.396 (.331-.473)	.360 (.320-.430)	.780 (.690-1.12)	1.75 (1.35-2.38)	3.02 (1.84-5.46)	583
50 years and older	11-12	.592 (.499-.702)	.570 (.450-.690)	1.01 (.880-1.23)	2.10 (1.47-3.34)	3.59 (2.24-5.88)	354
	13-14	.594 (.488-.723)	.560 (.480-.650)	1.30 (.990-1.55)	3.32 (2.32-4.48)	5.50 (2.84-25.6)	374
Gender							
Males	11-12	.546 (.448-.667)	.480 (.390-.580)	.880 (.730-1.12)	2.09 (1.27-3.04)	3.59 (2.24-5.74)	527
	13-14	.427 (.334-.544)	.370 (.320-.490)	.790 (.690-1.11)	2.36 (1.34-4.83)	5.46 (2.18-19.6)	512
Females	11-12	.626 (.506-.774)	.520 (.400-.660)	1.22 (.850-1.55)	2.94 (1.55-6.85)	6.85 (2.94-12.3)	349
	13-14	.477 (.416-.547)	.450 (.380-.550)	1.16 (.840-1.34)	2.12 (1.75-2.60)	3.32 (2.49-4.43)	445
Nonsmokers†							
Total	11-12	.591 (.529-.660)	.510 (.450-.580)	1.03 (.880-1.23)	2.65 (2.13-3.44)	4.74 (3.44-6.50)	1343
	13-14	.397 (.344-.459)	.360 (.320-.400)	.860 (.730-1.00)	2.12 (1.61-2.36)	3.20 (2.57-4.15)	1487
Age group							
20-49 years	11-12	.492 (.441-.549)	.410 (.370-.490)	.880 (.780-.990)	1.94 (1.41-2.48)	3.28 (2.23-5.54)	671
18-49 years	13-14	.327 (.276-.388)	.300 (.250-.360)	.730 (.540-.890)	1.57 (1.14-1.99)	2.29 (1.83-3.01)	778
50 years and older	11-12	.718 (.608-.849)	.580 (.470-.720)	1.24 (.990-1.67)	3.62 (2.39-4.74)	6.06 (3.62-9.43)	672
	13-14	.494 (.416-.587)	.400 (.340-.530)	1.06 (.810-1.36)	2.57 (2.22-3.09)	4.46 (3.21-6.37)	709
Gender							
Males	11-12	.613 (.521-.721)	.510 (.470-.580)	.990 (.790-1.26)	3.20 (1.85-4.81)	6.21 (3.20-9.46)	635
	13-14	.388 (.336-.448)	.340 (.280-.390)	.800 (.650-.990)	1.83 (1.45-2.31)	3.03 (2.26-4.70)	663
Females	11-12	.574 (.506-.651)	.490 (.420-.590)	1.03 (.870-1.28)	2.25 (2.07-3.08)	4.08 (3.10-5.40)	708
	13-14	.405 (.342-.481)	.370 (.310-.430)	.900 (.750-1.16)	2.22 (1.67-2.61)	3.30 (2.67-4.15)	824

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.22 and 0.09, respectively.

Urinary Tin (creatinine corrected) (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	.638 (.559-.729)	.557 (.484-.634)	1.04 (.815-1.32)	2.20 (1.86-2.81)	4.15 (2.81-5.52)	876
	13-14	.462 (.400-.533)	.419 (.333-.526)	.823 (.735-.986)	1.73 (1.46-2.41)	3.20 (2.49-4.92)	956
Age group							
20-49 years	11-12	.594 (.506-.697)	.519 (.433-.650)	.918 (.764-1.30)	2.00 (1.63-2.74)	4.15 (2.38-7.90)	522
18-49 years	13-14	.371 (.318-.433)	.333 (.274-.434)	.670 (.582-.796)	1.27 (.896-1.73)	2.21 (1.33-3.07)	582
50 years and older	11-12	.714 (.605-.842)	.576 (.459-.691)	1.24 (.772-1.52)	2.67 (1.49-3.82)	4.09 (2.74-5.86)	354
	13-14	.730 (.625-.853)	.646 (.532-.783)	1.35 (1.10-1.59)	3.36 (2.37-5.24)	5.69 (3.20-17.1)	374
Gender							
Males	11-12	.516 (.459-.579)	.482 (.403-.576)	.780 (.671-.918)	1.53 (1.18-2.05)	2.20 (1.88-3.11)	527
	13-14	.379 (.303-.473)	.319 (.250-.409)	.708 (.546-.818)	1.48 (1.01-2.69)	2.69 (1.60-6.49)	511
Females	11-12	.835 (.653-1.07)	.673 (.538-.818)	1.40 (.973-2.38)	3.30 (2.20-5.10)	5.14 (3.48-12.3)	349
	13-14	.563 (.490-.647)	.550 (.437-.656)	1.00 (.823-1.27)	1.89 (1.59-2.49)	3.39 (2.49-5.50)	445
Nonsmokers†							
Total	11-12	.691 (.620-.769)	.610 (.552-.678)	1.11 (.975-1.34)	2.50 (1.98-2.99)	4.50 (3.10-5.55)	1342
	13-14	.473 (.417-.537)	.417 (.378-.472)	.889 (.735-1.06)	1.92 (1.78-2.21)	3.19 (2.72-3.65)	1486
Age group							
20-49 years	11-12	.539 (.484-.601)	.500 (.442-.550)	.872 (.766-.975)	1.72 (1.20-2.39)	3.04 (1.95-4.43)	670
18-49 years	13-14	.358 (.320-.401)	.333 (.286-.372)	.614 (.567-.697)	1.28 (1.13-1.65)	2.07 (1.78-2.64)	778
50 years and older	11-12	.898 (.782-1.03)	.778 (.653-.895)	1.67 (1.22-1.98)	2.91 (2.52-5.06)	5.58 (4.22-7.26)	672
	13-14	.647 (.552-.758)	.549 (.482-.643)	1.33 (1.03-1.55)	2.71 (2.02-3.26)	4.00 (2.99-5.70)	708
Gender							
Males	11-12	.550 (.454-.665)	.466 (.403-.565)	.829 (.653-1.32)	2.28 (1.37-4.04)	4.17 (2.29-6.27)	634
	13-14	.373 (.324-.429)	.332 (.288-.375)	.640 (.504-.787)	1.54 (1.26-1.84)	2.55 (1.96-3.25)	662
Females	11-12	.825 (.726-.937)	.753 (.625-.867)	1.28 (1.09-1.60)	2.56 (2.23-3.22)	4.50 (3.10-6.07)	708
	13-14	.575 (.494-.670)	.529 (.459-.579)	1.13 (.880-1.36)	2.27 (1.83-2.76)	3.63 (2.95-4.16)	824

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Urinary Tungsten (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	.074 (.063-.089)	.070 (.060-.083)	.142 (.113-.184)	.285 (.197-.467)	.496 (.258-.838)	866
	13-14	.059 (.052-.066)	.062 (.050-.072)	.128 (.114-.143)	.221 (.197-.247)	.291 (.250-.398)	957
Age group							
20-49 years	11-12	.081 (.064-.103)	.077 (.065-.094)	.154 (.116-.227)	.361 (.182-.611)	.527 (.265-.838)	513
18-49 years	13-14	.065 (.057-.074)	.068 (.057-.083)	.137 (.121-.161)	.230 (.196-.269)	.375 (.260-.465)	583
50 years and older	11-12	.065 (.056-.076)	.063 (.048-.075)	.120 (.088-.165)	.235 (.162-.286)	.298 (.227-.512)	353
	13-14	.047 (.039-.058)	.049 (.035-.065)	.104 (.083-.126)	.207 (.147-.254)	.256 (.211-.292)	374
Gender							
Males	11-12	.083 (.065-.106)	.075 (.060-.099)	.164 (.116-.218)	.351 (.183-.703)	.611 (.265-.838)	522
	13-14	.064 (.057-.072)	.068 (.057-.082)	.132 (.117-.145)	.214 (.196-.230)	.272 (.230-.380)	512
Females	11-12	.065 (.054-.078)	.064 (.049-.079)	.131 (.090-.180)	.228 (.175-.312)	.366 (.234-.479)	344
	13-14	.054 (.045-.064)	.055 (.039-.069)	.124 (.097-.153)	.236 (.186-.276)	.311 (.256-.483)	445
Nonsmokers†							
Total	11-12	.064 (.058-.072)	.058 (.053-.064)	.117 (.099-.140)	.234 (.183-.319)	.364 (.274-.474)	1337
	13-14	.050 (.044-.057)	.048 (.039-.057)	.106 (.087-.123)	.213 (.175-.245)	.343 (.264-.419)	1487
Age group							
20-49 years	11-12	.072 (.061-.086)	.067 (.055-.082)	.132 (.106-.178)	.283 (.184-.405)	.405 (.277-.743)	668
18-49 years	13-14	.052 (.043-.062)	.050 (.037-.068)	.119 (.098-.142)	.221 (.188-.264)	.350 (.264-.468)	778
50 years and older	11-12	.057 (.052-.063)	.053 (.047-.058)	.098 (.085-.122)	.200 (.167-.225)	.307 (.216-.426)	669
	13-14	.048 (.041-.056)	.046 (.038-.054)	.095 (.076-.119)	.190 (.138-.259)	.280 (.227-.507)	709
Gender							
Males	11-12	.073 (.064-.083)	.068 (.057-.080)	.138 (.116-.166)	.271 (.190-.384)	.405 (.246-.628)	632
	13-14	.056 (.049-.065)	.053 (.044-.065)	.120 (.097-.157)	.243 (.203-.310)	.379 (.298-.468)	663
Females	11-12	.058 (.053-.065)	.053 (.047-.059)	.103 (.086-.124)	.220 (.170-.277)	.322 (.237-.472)	705
	13-14	.045 (.040-.051)	.045 (.034-.054)	.097 (.080-.109)	.176 (.148-.216)	.280 (.226-.393)	824

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.026 and 0.018, respectively.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Tungsten_BiomonitoringSummary.html

Urinary Tungsten (creatinine corrected) (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	.082 (.072-.093)	.076 (.069-.088)	.129 (.115-.143)	.238 (.162-.365)	.365 (.247-.633)	866
	13-14	.060 (.054-.067)	.059 (.052-.069)	.107 (.097-.118)	.170 (.149-.191)	.241 (.192-.319)	956
Age group							
20-49 years	11-12	.084 (.070-.101)	.083 (.068-.096)	.136 (.113-.171)	.247 (.140-.391)	.374 (.247-.658)	513
18-49 years	13-14	.061 (.055-.067)	.059 (.051-.069)	.108 (.099-.120)	.162 (.142-.186)	.214 (.186-.277)	582
50 years and older	11-12	.078 (.070-.088)	.074 (.064-.082)	.123 (.106-.138)	.208 (.163-.233)	.262 (.226-.288)	353
	13-14	.058 (.048-.071)	.057 (.049-.072)	.100 (.084-.123)	.179 (.142-.225)	.281 (.175-.480)	374
Gender							
Males	11-12	.078 (.064-.095)	.075 (.062-.091)	.123 (.098-.150)	.247 (.129-.391)	.370 (.229-.571)	522
	13-14	.057 (.051-.064)	.058 (.048-.071)	.099 (.087-.117)	.162 (.142-.186)	.198 (.186-.254)	511
Females	11-12	.087 (.072-.103)	.082 (.069-.098)	.139 (.118-.163)	.230 (.193-.313)	.343 (.229-.733)	344
	13-14	.063 (.055-.073)	.059 (.050-.076)	.118 (.101-.125)	.175 (.154-.215)	.281 (.198-.364)	445
Nonsmokers†							
Total	11-12	.075 (.068-.084)	.069 (.064-.075)	.126 (.105-.146)	.223 (.174-.275)	.345 (.233-.492)	1336
	13-14	.060 (.053-.067)	.057 (.048-.065)	.105 (.091-.119)	.190 (.162-.227)	.310 (.246-.371)	1486
Age group							
20-49 years	11-12	.079 (.068-.092)	.074 (.064-.083)	.128 (.106-.168)	.246 (.183-.374)	.391 (.233-.659)	667
18-49 years	13-14	.057 (.050-.065)	.054 (.046-.066)	.100 (.084-.116)	.172 (.155-.204)	.270 (.226-.324)	778
50 years and older	11-12	.072 (.065-.079)	.065 (.062-.074)	.122 (.099-.135)	.192 (.157-.238)	.261 (.206-.366)	669
	13-14	.063 (.054-.073)	.059 (.049-.070)	.110 (.090-.130)	.224 (.155-.287)	.334 (.251-.701)	708
Gender							
Males	11-12	.065 (.057-.075)	.062 (.055-.068)	.107 (.088-.130)	.180 (.133-.261)	.261 (.172-.458)	631
	13-14	.055 (.047-.063)	.053 (.042-.065)	.099 (.081-.119)	.162 (.133-.223)	.300 (.194-.377)	662
Females	11-12	.084 (.077-.092)	.076 (.069-.082)	.142 (.120-.164)	.244 (.200-.334)	.391 (.268-.544)	705
	13-14	.064 (.058-.071)	.059 (.052-.067)	.112 (.102-.122)	.220 (.172-.251)	.310 (.261-.367)	824

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Tungsten_BiomonitoringSummary.html

Urinary Uranium (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	.007 (.006-.009)	.007 (.006-.008)	.013 (.010-.017)	.024 (.019-.034)	.035 (.026-.057)	876
	13-14	.006 (.005-.007)	.006 (.005-.007)	.012 (.009-.015)	.025 (.017-.039)	.039 (.027-.062)	957
Age group							
20-49 years	11-12	.008 (.006-.009)	.007 (.006-.009)	.013 (.010-.018)	.023 (.018-.034)	.036 (.023-.069)	522
18-49 years	13-14	.006 (.005-.007)	.006 (.005-.007)	.011 (.009-.013)	.024 (.016-.033)	.033 (.026-.054)	583
50 years and older	11-12	.007 (.006-.009)	.007 (.005-.007)	.013 (.008-.017)	.025 (.017-.033)	.034 (.026-.039)	354
	13-14	.006 (.005-.007)	.005 (.004-.007)	.012 (.008-.017)	.030 (.016-.058)	.048 (.035-.076)	374
Gender							
Males	11-12	.008 (.006-.009)	.007 (.006-.008)	.013 (.010-.016)	.026 (.017-.040)	.040 (.022-.069)	527
	13-14	.006 (.005-.007)	.006 (.005-.008)	.012 (.010-.014)	.023 (.016-.033)	.034 (.024-.054)	512
Females	11-12	.007 (.006-.009)	.007 (.005-.009)	.013 (.008-.019)	.023 (.018-.027)	.029 (.023-.060)	349
	13-14	.006 (.005-.007)	.006 (.005-.007)	.012 (.008-.017)	.027 (.016-.042)	.042 (.030-.076)	445
Nonsmokers†							
Total	11-12	.005 (.005-.006)	.005 (.004-.006)	.009 (.007-.012)	.016 (.013-.022)	.025 (.020-.032)	1343
	13-14	.005 (.004-.006)	.004 (.004-.005)	.009 (.007-.011)	.023 (.014-.030)	.035 (.024-.056)	1487
Age group							
20-49 years	11-12	.005 (.004-.006)	.005 (.004-.006)	.008 (.007-.010)	.015 (.011-.021)	.023 (.016-.031)	671
18-49 years	13-14	.005 (.004-.006)	.004 (.004-.005)	.010 (.008-.012)	.023 (.014-.031)	.034 (.023-.053)	778
50 years and older	11-12	.006 (.005-.007)	.005 (.004-.006)	.011 (.007-.014)	.017 (.014-.025)	.028 (.019-.043)	672
	13-14	.005 (.004-.006)	.004 (.003-.005)	.009 (.007-.011)	.023 (.013-.034)	.035 (.024-.061)	709
Gender							
Males	11-12	.006 (.005-.007)	.005 (.004-.007)	.010 (.007-.013)	.016 (.013-.022)	.023 (.016-.040)	635
	13-14	.005 (.004-.006)	.004 (.003-.005)	.009 (.007-.013)	.024 (.014-.038)	.038 (.026-.056)	663
Females	11-12	.005 (.005-.006)	.005 (.004-.006)	.009 (.007-.011)	.017 (.013-.025)	.028 (.020-.038)	708
	13-14	.005 (.004-.006)	.004 (.004-.005)	.009 (.007-.011)	.021 (.013-.030)	.033 (.023-.053)	824

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.003 and 0.002, respectively.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Uranium_BiomonitoringSummary.html

Urinary Uranium (creatinine corrected) (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	.008 (.007-.010)	.007 (.007-.009)	.013 (.011-.016)	.022 (.019-.026)	.031 (.022-.073)	876
	13-14	.006 (.005-.007)	.005 (.004-.007)	.011 (.008-.013)	.020 (.014-.030)	.031 (.021-.052)	956
Age group							
20-49 years	11-12	.008 (.006-.010)	.007 (.006-.009)	.013 (.010-.015)	.022 (.019-.027)	.030 (.021-.083)	522
18-49 years	13-14	.006 (.005-.007)	.005 (.004-.006)	.010 (.007-.011)	.017 (.013-.023)	.026 (.020-.036)	582
50 years and older	11-12	.008 (.007-.010)	.008 (.006-.011)	.014 (.012-.017)	.021 (.019-.027)	.034 (.022-.058)	354
	13-14	.007 (.005-.009)	.006 (.004-.009)	.013 (.009-.016)	.025 (.015-.052)	.051 (.022-.101)	374
Gender							
Males	11-12	.007 (.006-.009)	.007 (.005-.009)	.012 (.008-.016)	.020 (.014-.030)	.027 (.019-.083)	527
	13-14	.005 (.005-.006)	.005 (.004-.005)	.008 (.006-.011)	.018 (.013-.022)	.025 (.021-.035)	511
Females	11-12	.009 (.008-.010)	.009 (.007-.010)	.014 (.012-.017)	.025 (.021-.030)	.037 (.024-.058)	349
	13-14	.007 (.006-.009)	.006 (.005-.009)	.012 (.009-.015)	.022 (.014-.046)	.043 (.022-.085)	445
Nonsmokers†							
Total	11-12	.006 (.005-.007)	.006 (.005-.007)	.010 (.008-.013)	.020 (.014-.027)	.028 (.021-.035)	1342
	13-14	.006 (.005-.007)	.005 (.004-.006)	.010 (.008-.012)	.020 (.014-.033)	.037 (.020-.058)	1486
Age group							
20-49 years	11-12	.006 (.005-.006)	.005 (.005-.006)	.009 (.007-.012)	.019 (.013-.024)	.027 (.020-.029)	670
18-49 years	13-14	.005 (.005-.006)	.005 (.004-.006)	.009 (.007-.011)	.018 (.012-.025)	.028 (.019-.060)	778
50 years and older	11-12	.007 (.006-.008)	.007 (.006-.008)	.012 (.009-.014)	.020 (.015-.032)	.034 (.023-.051)	672
	13-14	.006 (.005-.008)	.005 (.005-.006)	.011 (.008-.015)	.023 (.014-.042)	.043 (.027-.058)	708
Gender							
Males	11-12	.005 (.004-.006)	.005 (.004-.006)	.008 (.007-.009)	.013 (.010-.020)	.020 (.013-.029)	634
	13-14	.005 (.004-.006)	.004 (.004-.005)	.008 (.006-.010)	.016 (.010-.027)	.027 (.014-.074)	662
Females	11-12	.008 (.006-.009)	.007 (.006-.008)	.013 (.010-.016)	.022 (.018-.028)	.033 (.027-.040)	708
	13-14	.007 (.006-.008)	.006 (.005-.007)	.011 (.009-.014)	.023 (.016-.038)	.042 (.024-.067)	824

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Uranium_BiomonitoringSummary.html

Urinary Nitrate (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in mg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	47.1 (43.6-50.8)	49.3 (45.4-52.3)	82.8 (70.0-90.9)	121 (107-133)	149 (127-173)	869
	13-14	47.7 (43.8-51.9)	51.1 (45.2-58.0)	82.8 (76.7-90.2)	117 (107-134)	142 (135-155)	947
Age group							
20-49 years	11-12	48.4 (44.2-52.9)	52.2 (46.7-57.4)	82.6 (69.3-94.4)	120 (98.8-145)	150 (123-224)	518
18-49 years	13-14	51.0 (46.1-56.3)	54.9 (49.5-62.4)	89.1 (78.4-99.8)	122 (111-139)	146 (135-183)	577
50 years and older	11-12	45.0 (40.2-50.5)	46.1 (39.4-54.4)	82.8 (64.5-91.7)	121 (102-140)	145 (107-173)	351
	13-14	41.4 (36.8-46.6)	41.0 (35.4-45.4)	71.4 (63.5-83.5)	106 (87.1-126)	129 (101-248)	370
Gender							
Males	11-12	50.5 (45.7-55.8)	52.2 (46.5-60.2)	88.1 (79.0-98.6)	124 (105-152)	166 (123-192)	525
	13-14	49.9 (44.7-55.8)	54.8 (48.3-60.0)	82.4 (74.3-94.8)	118 (106-135)	141 (118-189)	511
Females	11-12	43.0 (38.3-48.3)	44.2 (38.8-52.2)	69.8 (63.9-81.5)	110 (89.3-145)	145 (107-241)	344
	13-14	45.4 (41.1-50.2)	47.0 (40.4-54.5)	82.8 (70.4-93.8)	114 (101-135)	145 (129-179)	436
Nonsmokers†							
Total	11-12	39.2 (36.5-42.0)	41.5 (38.6-44.8)	67.9 (62.8-73.5)	102 (93.7-113)	132 (114-150)	1319
	13-14	38.0 (36.1-40.1)	38.9 (37.3-41.2)	66.9 (61.7-71.9)	99.8 (92.3-107)	128 (116-151)	1477
Age group							
20-49 years	11-12	42.3 (38.2-46.9)	44.5 (41.0-48.0)	71.9 (64.5-80.6)	113 (94.5-120)	138 (114-180)	659
18-49 years	13-14	40.1 (37.3-43.0)	40.8 (37.3-45.3)	69.2 (62.3-77.4)	102 (95.9-108)	132 (111-153)	774
50 years and older	11-12	36.0 (32.5-40.0)	38.7 (33.1-44.2)	60.8 (54.0-70.9)	93.7 (83.0-108)	120 (102-148)	660
	13-14	35.9 (32.6-39.4)	37.6 (32.6-41.5)	65.0 (55.5-71.2)	92.3 (85.6-109)	128 (109-157)	703
Gender							
Males	11-12	45.4 (41.3-49.9)	45.2 (42.1-49.8)	73.3 (65.4-77.5)	108 (89.0-132)	150 (103-178)	628
	13-14	41.7 (38.1-45.8)	42.3 (38.2-48.9)	69.6 (60.2-81.6)	101 (88.3-116)	134 (109-156)	661
Females	11-12	34.9 (31.8-38.2)	37.5 (32.2-43.0)	60.8 (55.8-68.9)	99.3 (89.1-113)	119 (112-139)	691
	13-14	35.2 (32.8-37.8)	36.9 (31.9-38.9)	65.4 (59.0-68.9)	98.7 (90.1-108)	124 (109-157)	816

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.7 and 0.7, respectively.

Urinary Nitrate (creatinine corrected) (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in mg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	52.0 (48.0-56.3)	51.7 (44.4-58.6)	71.7 (64.7-78.8)	91.9 (86.1-108)	133 (95.0-165)	869
	13-14	48.4 (46.1-50.8)	47.5 (45.0-50.1)	65.4 (60.3-70.1)	89.4 (80.6-104)	113 (105-128)	947
Age group							
20-49 years	11-12	50.4 (46.0-55.2)	47.7 (42.0-54.5)	65.9 (60.0-73.2)	88.9 (79.2-112)	136 (88.9-187)	518
18-49 years	13-14	47.1 (44.3-50.0)	46.4 (43.0-49.7)	60.3 (55.4-67.3)	83.2 (71.3-107)	107 (86.7-130)	577
50 years and older	11-12	54.4 (49.6-59.7)	57.2 (49.4-60.9)	80.9 (66.1-86.3)	99.3 (87.2-107)	109 (98.8-144)	351
	13-14	51.4 (45.9-57.5)	49.4 (45.0-57.0)	72.5 (64.9-76.4)	104 (80.6-118)	119 (101-168)	370
Gender							
Males	11-12	47.8 (43.9-52.1)	47.7 (42.1-53.0)	61.8 (58.6-68.8)	87.1 (73.9-95.0)	102 (87.2-133)	525
	13-14	44.3 (40.0-48.9)	42.8 (38.9-48.8)	55.9 (51.8-67.1)	83.2 (64.1-106)	108 (89.4-133)	511
Females	11-12	57.7 (52.3-63.7)	58.8 (51.1-65.3)	80.9 (71.8-84.8)	104 (88.1-142)	144 (102-241)	344
	13-14	53.1 (49.3-57.1)	51.6 (46.5-57.0)	72.2 (66.4-76.2)	99.6 (78.8-113)	116 (106-149)	436
Nonsmokers†							
Total	11-12	46.0 (42.9-49.2)	43.8 (40.9-46.4)	67.4 (59.5-73.6)	106 (90.2-121)	145 (119-166)	1318
	13-14	45.6 (43.3-48.0)	44.5 (41.9-47.5)	65.4 (61.8-70.4)	97.4 (90.5-105)	123 (115-136)	1476
Age group							
20-49 years	11-12	46.6 (42.4-51.1)	42.7 (38.7-47.0)	63.8 (54.7-72.5)	107 (84.9-137)	150 (107-173)	658
18-49 years	13-14	44.1 (42.1-46.2)	42.5 (40.0-44.3)	61.1 (56.8-65.0)	93.5 (83.9-102)	120 (105-130)	774
50 years and older	11-12	45.4 (41.2-49.9)	45.0 (41.1-50.0)	68.5 (56.6-84.9)	99.4 (85.2-120)	140 (112-151)	660
	13-14	47.3 (43.3-51.6)	48.4 (42.2-53.1)	71.3 (64.7-79.2)	105 (90.0-117)	135 (112-162)	702
Gender							
Males	11-12	40.6 (37.9-43.4)	39.1 (36.4-41.7)	54.6 (51.0-60.9)	84.9 (69.3-98.4)	106 (87.2-120)	627
	13-14	40.6 (37.8-43.5)	38.2 (35.3-42.1)	55.7 (50.6-62.8)	79.7 (76.0-86.7)	104 (86.7-123)	660
Females	11-12	50.7 (45.8-56.1)	47.8 (43.6-53.6)	76.5 (67.7-86.6)	124 (101-151)	154 (137-186)	691
	13-14	50.2 (47.3-53.3)	50.3 (46.2-54.1)	72.4 (67.0-77.1)	108 (98.7-120)	139 (120-167)	816

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Urinary Perchlorate (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	2.53 (2.29-2.81)	2.73 (2.34-3.07)	4.72 (3.91-5.50)	7.64 (7.18-9.44)	10.3 (7.98-15.4)	869
	13-14	2.41 (2.17-2.67)	2.41 (2.03-3.03)	4.53 (4.24-4.79)	7.09 (6.18-8.29)	9.54 (7.92-13.2)	947
Age group							
20-49 years	11-12	2.59 (2.27-2.96)	2.75 (2.34-3.24)	4.72 (3.82-5.77)	8.92 (6.00-10.7)	11.7 (8.84-23.5)	518
18-49 years	13-14	2.52 (2.30-2.75)	2.86 (2.21-3.28)	4.72 (4.48-5.20)	7.28 (6.19-8.29)	9.34 (7.62-12.3)	577
50 years and older	11-12	2.44 (2.05-2.91)	2.59 (1.95-3.39)	4.68 (3.39-6.26)	7.41 (5.64-8.40)	8.60 (7.49-10.7)	351
	13-14	2.19 (1.82-2.64)	2.13 (1.80-2.42)	3.78 (3.20-4.10)	6.44 (5.02-10.4)	12.5 (9.05-21.9)	370
Gender							
Males	11-12	2.76 (2.42-3.13)	2.98 (2.51-3.36)	5.45 (4.26-6.32)	8.26 (7.23-10.3)	10.6 (8.26-26.6)	525
	13-14	2.45 (2.22-2.69)	2.39 (1.98-3.17)	4.53 (4.24-4.72)	6.63 (5.90-7.20)	9.34 (6.63-12.5)	511
Females	11-12	2.28 (2.02-2.58)	2.49 (1.99-2.90)	4.08 (3.63-4.63)	7.18 (5.01-9.20)	9.45 (7.60-11.5)	344
	13-14	2.37 (2.03-2.76)	2.41 (1.94-2.96)	4.47 (3.78-5.00)	7.72 (6.34-8.66)	11.4 (7.82-17.5)	436
Nonsmokers†							
Total	11-12	2.95 (2.75-3.15)	2.96 (2.71-3.22)	5.40 (5.01-5.74)	9.11 (8.34-10.4)	12.8 (11.1-14.8)	1319
	13-14	2.51 (2.34-2.70)	2.44 (2.26-2.69)	4.54 (4.17-4.97)	7.60 (6.91-8.24)	9.90 (8.57-11.5)	1477
Age group							
20-49 years	11-12	2.87 (2.59-3.18)	2.88 (2.36-3.38)	5.47 (4.83-6.58)	9.11 (7.99-10.9)	12.1 (9.70-16.8)	659
18-49 years	13-14	2.51 (2.32-2.71)	2.42 (2.22-2.76)	4.76 (4.22-5.54)	7.92 (7.06-8.48)	9.90 (8.57-11.8)	774
50 years and older	11-12	3.03 (2.68-3.43)	3.00 (2.54-3.47)	5.21 (4.25-6.12)	9.02 (7.50-11.2)	14.4 (10.3-18.4)	660
	13-14	2.52 (2.30-2.76)	2.47 (2.25-2.71)	4.25 (3.80-4.66)	7.07 (6.17-8.02)	10.3 (8.21-12.0)	703
Gender							
Males	11-12	3.32 (3.01-3.66)	3.30 (2.97-3.67)	5.70 (5.04-7.10)	10.4 (8.34-11.1)	13.8 (11.1-18.1)	628
	13-14	2.64 (2.37-2.94)	2.79 (2.46-3.08)	4.65 (4.09-5.44)	7.73 (6.46-9.10)	10.2 (8.35-13.4)	661
Females	11-12	2.68 (2.45-2.94)	2.63 (2.39-2.95)	5.04 (4.02-5.97)	8.46 (7.95-9.48)	12.6 (10.6-15.2)	691
	13-14	2.41 (2.22-2.62)	2.25 (2.11-2.44)	4.37 (3.81-5.16)	7.52 (6.76-8.06)	9.19 (8.06-11.4)	816

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.05 and 0.05, respectively.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Perchlorate_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Perchlorate_FactSheet.html

Urinary Perchlorate (creatinine corrected) (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	2.80 (2.57-3.05)	2.68 (2.35-2.96)	4.50 (4.08-4.88)	7.32 (6.20-7.61)	9.53 (7.50-13.8)	869
	13-14	2.44 (2.26-2.64)	2.34 (2.16-2.62)	3.65 (3.35-4.11)	5.90 (5.16-7.86)	9.73 (7.86-11.1)	947
Age group							
20-49 years	11-12	2.70 (2.37-3.09)	2.53 (2.18-3.07)	4.45 (3.86-5.14)	7.08 (5.38-9.16)	9.66 (7.08-23.5)	518
18-49 years	13-14	2.32 (2.12-2.54)	2.24 (2.07-2.54)	3.52 (3.24-3.75)	5.60 (4.57-6.00)	7.86 (5.60-10.1)	577
50 years and older	11-12	2.95 (2.65-3.30)	2.73 (2.21-3.16)	4.63 (3.77-5.24)	7.45 (5.11-9.62)	9.03 (7.50-11.6)	351
	13-14	2.71 (2.37-3.10)	2.62 (2.19-3.07)	4.25 (3.52-4.94)	8.06 (5.62-10.5)	11.6 (8.35-17.1)	370
Gender							
Males	11-12	2.61 (2.36-2.89)	2.33 (2.11-2.70)	4.27 (3.90-4.72)	7.13 (5.56-7.53)	9.66 (7.13-23.5)	525
	13-14	2.17 (1.98-2.38)	2.21 (1.92-2.54)	3.30 (3.04-3.57)	5.16 (4.35-5.77)	7.90 (5.77-10.5)	511
Females	11-12	3.06 (2.71-3.45)	3.02 (2.73-3.41)	4.73 (4.45-5.18)	7.50 (6.21-8.87)	9.16 (7.50-11.7)	344
	13-14	2.76 (2.53-3.01)	2.62 (2.34-2.96)	4.12 (3.61-4.57)	7.57 (5.03-10.1)	10.1 (7.86-12.3)	436
Nonsmokers†							
Total	11-12	3.45 (3.19-3.74)	3.36 (3.02-3.68)	5.83 (5.49-6.10)	9.81 (8.13-11.8)	15.0 (11.0-18.5)	1318
	13-14	3.01 (2.80-3.24)	2.97 (2.76-3.24)	4.82 (4.52-5.41)	7.55 (6.70-8.35)	10.3 (8.80-11.7)	1476
Age group							
20-49 years	11-12	3.15 (2.80-3.54)	2.95 (2.53-3.44)	5.60 (4.53-6.36)	9.20 (7.21-11.1)	12.8 (9.81-17.4)	658
18-49 years	13-14	2.76 (2.52-3.01)	2.71 (2.53-2.88)	4.60 (4.02-5.10)	7.33 (6.21-8.44)	9.68 (8.10-11.7)	774
50 years and older	11-12	3.82 (3.37-4.32)	3.66 (3.33-4.06)	6.09 (5.28-6.80)	10.0 (7.86-14.9)	16.9 (11.0-23.6)	660
	13-14	3.32 (3.08-3.59)	3.36 (2.97-3.73)	5.21 (4.67-5.69)	8.03 (6.81-8.71)	10.6 (9.16-12.7)	702
Gender							
Males	11-12	2.96 (2.68-3.28)	2.92 (2.55-3.22)	4.65 (4.07-5.35)	7.04 (6.09-9.31)	13.4 (7.21-20.0)	627
	13-14	2.56 (2.33-2.83)	2.44 (2.20-2.75)	4.18 (3.66-4.64)	6.50 (5.66-7.48)	8.35 (7.03-11.0)	660
Females	11-12	3.90 (3.51-4.33)	3.82 (3.17-4.58)	6.48 (6.02-7.49)	10.2 (9.22-12.7)	16.2 (11.8-19.2)	691
	13-14	3.44 (3.18-3.71)	3.49 (3.14-3.76)	5.62 (4.77-6.04)	8.16 (7.33-9.35)	11.4 (9.45-13.8)	816

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Perchlorate_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Perchlorate_FactSheet.html

Urinary Thiocyanate (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in mg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	4.10 (3.58-4.69)	4.60 (3.98-5.37)	7.16 (6.43-8.09)	11.2 (9.43-12.7)	14.6 (12.7-16.2)	869
	13-14	3.93 (3.56-4.33)	4.48 (3.93-4.78)	7.45 (6.70-8.23)	12.5 (10.2-14.0)	15.2 (13.9-17.7)	944
Age group							
20-49 years	11-12	4.18 (3.72-4.69)	4.67 (4.15-5.05)	7.38 (6.43-8.20)	11.7 (10.2-13.3)	15.9 (12.7-17.8)	518
18-49 years	13-14	3.99 (3.46-4.61)	4.72 (3.90-5.32)	7.90 (6.96-8.89)	13.5 (10.8-14.5)	16.0 (14.1-18.0)	575
50 years and older	11-12	3.98 (3.24-4.90)	4.38 (3.37-5.94)	6.90 (5.48-8.14)	9.94 (7.67-13.5)	12.8 (9.50-15.3)	351
	13-14	3.79 (3.40-4.23)	3.87 (3.41-4.63)	6.53 (5.45-7.58)	9.98 (9.02-12.6)	14.4 (11.5-18.3)	369
Gender							
Males	11-12	4.03 (3.26-4.98)	4.51 (3.30-6.14)	7.23 (6.43-8.59)	11.1 (8.99-13.4)	14.5 (11.8-17.8)	525
	13-14	3.81 (3.31-4.39)	4.63 (3.73-5.19)	7.59 (6.60-8.92)	13.5 (10.7-14.5)	15.6 (14.1-18.5)	508
Females	11-12	4.19 (3.81-4.61)	4.71 (4.31-5.37)	6.83 (6.12-7.95)	11.3 (8.53-13.1)	15.3 (11.9-18.2)	344
	13-14	4.05 (3.61-4.54)	4.30 (3.88-4.78)	7.15 (6.16-8.24)	11.3 (9.40-14.1)	14.5 (11.3-17.7)	436
Nonsmokers†							
Total	11-12	.795 (.737-.858)	.875 (.819-.929)	1.56 (1.41-1.74)	2.54 (2.23-2.92)	3.23 (2.97-3.57)	1319
	13-14	.791 (.745-.841)	.799 (.737-.861)	1.48 (1.37-1.55)	2.55 (2.31-2.89)	3.67 (2.96-4.47)	1476
Age group							
20-49 years	11-12	.855 (.777-.940)	.927 (.854-1.00)	1.71 (1.50-1.92)	2.67 (2.29-3.17)	3.43 (3.01-4.36)	659
18-49 years	13-14	.838 (.774-.907)	.862 (.766-.988)	1.54 (1.43-1.73)	2.54 (2.31-2.96)	3.75 (2.96-5.03)	774
50 years and older	11-12	.736 (.666-.814)	.833 (.726-.897)	1.44 (1.21-1.68)	2.39 (1.94-2.90)	2.92 (2.39-3.86)	660
	13-14	.742 (.668-.824)	.751 (.668-.843)	1.36 (1.19-1.57)	2.66 (1.96-3.26)	3.67 (2.70-4.81)	702
Gender							
Males	11-12	.968 (.865-1.08)	1.01 (.913-1.20)	1.90 (1.57-2.20)	2.79 (2.31-3.25)	3.43 (2.94-4.10)	628
	13-14	.938 (.853-1.03)	.911 (.830-1.05)	1.79 (1.55-2.07)	2.96 (2.44-3.81)	4.33 (3.10-5.93)	661
Females	11-12	.681 (.600-.773)	.727 (.603-.843)	1.36 (1.21-1.50)	2.27 (1.97-2.54)	3.17 (2.52-3.32)	691
	13-14	.687 (.634-.744)	.694 (.621-.779)	1.29 (1.14-1.39)	2.20 (1.91-2.36)	3.10 (2.67-3.75)	815

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.02 and 0.02, respectively.

Urinary Thiocyanate (creatinine corrected) (2011 – 2014)

Geometric mean and selected percentiles of urine concentrations (in mg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	4.53 (4.02-5.10)	5.04 (4.38-5.47)	8.28 (7.42-10.0)	14.4 (11.6-15.7)	16.7 (15.3-18.9)	869
	13-14	3.99 (3.57-4.47)	4.37 (3.99-5.00)	7.81 (7.12-8.51)	11.9 (10.4-14.3)	15.6 (13.5-18.6)	944
Age group							
20-49 years	11-12	4.35 (3.87-4.89)	4.84 (3.82-5.47)	7.98 (7.54-8.91)	14.0 (11.1-16.1)	16.7 (14.2-19.9)	518
18-49 years	13-14	3.69 (3.25-4.19)	4.17 (3.75-4.68)	7.40 (6.33-8.43)	11.7 (10.4-13.8)	14.4 (12.9-15.9)	575
50 years and older	11-12	4.81 (4.06-5.71)	5.28 (4.43-6.84)	8.84 (7.11-12.1)	15.3 (10.5-17.2)	16.6 (15.3-18.3)	351
	13-14	4.71 (4.16-5.34)	4.68 (4.42-5.62)	8.12 (7.37-9.45)	12.9 (10.3-18.4)	18.6 (11.0-22.8)	369
Gender							
Males	11-12	3.81 (3.28-4.43)	4.20 (3.64-5.06)	7.30 (6.54-7.77)	11.1 (9.41-12.5)	14.3 (12.3-15.6)	525
	13-14	3.38 (2.96-3.86)	4.14 (3.13-4.49)	7.12 (6.14-7.87)	11.0 (9.50-11.7)	13.2 (11.7-14.9)	508
Females	11-12	5.62 (4.64-6.81)	5.82 (4.69-8.05)	11.1 (8.53-14.6)	16.7 (14.0-18.9)	19.2 (16.7-24.0)	344
	13-14	4.73 (4.12-5.42)	4.87 (4.08-5.92)	8.19 (7.52-9.75)	13.8 (10.7-17.1)	17.9 (14.2-21.2)	436
Nonsmokers†							
Total	11-12	.933 (.881-.988)	.976 (.905-1.10)	1.69 (1.54-1.84)	2.70 (2.34-2.99)	3.29 (3.02-3.89)	1318
	13-14	.948 (.882-1.02)	.994 (.908-1.06)	1.68 (1.54-1.80)	2.71 (2.28-3.00)	3.74 (3.13-4.47)	1475
Age group							
20-49 years	11-12	.938 (.864-1.02)	1.01 (.902-1.10)	1.67 (1.46-1.84)	2.51 (2.18-2.91)	3.02 (2.91-3.18)	658
18-49 years	13-14	.922 (.843-1.01)	.950 (.860-1.04)	1.52 (1.37-1.66)	2.33 (2.09-2.57)	3.37 (2.60-4.40)	774
50 years and older	11-12	.927 (.852-1.01)	.965 (.830-1.18)	1.72 (1.46-1.99)	2.91 (2.16-3.37)	3.76 (3.16-4.33)	660
	13-14	.979 (.880-1.09)	1.05 (.890-1.24)	1.85 (1.55-2.08)	2.92 (2.41-3.56)	4.13 (3.14-5.08)	701
Gender							
Males	11-12	.865 (.782-.956)	.941 (.743-1.09)	1.56 (1.28-1.87)	2.66 (2.09-2.96)	3.37 (2.67-4.05)	627
	13-14	.912 (.832-.999)	.983 (.854-1.12)	1.62 (1.47-1.82)	2.75 (2.17-3.19)	4.13 (2.88-5.08)	660
Females	11-12	.990 (.910-1.08)	1.05 (.936-1.17)	1.75 (1.59-1.91)	2.86 (2.41-3.03)	3.29 (2.97-3.96)	691
	13-14	.980 (.910-1.05)	1.01 (.923-1.06)	1.71 (1.55-1.81)	2.69 (2.26-3.13)	3.53 (2.94-4.15)	815

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Urinary 2-Hydroxyfluorene (2011 – 2012)‡

Metabolite of Fluorene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	1120 (983-1290)	1290 (1060-1430)	2340 (2100-2620)	3960 (3380-4570)	5600 (4730-6100)	885
Age group							
20-49 years	11-12	1050 (862-1280)	1220 (990-1410)	2260 (1870-2520)	3430 (2740-4260)	4760 (3840-5330)	530
50 years and older	11-12	1250 (1080-1440)	1380 (1030-1840)	2520 (2140-3380)	4900 (3800-5910)	6100 (4900-6960)	355
Gender							
Males	11-12	1130 (925-1380)	1330 (976-1540)	2480 (2090-3020)	4260 (3550-5600)	5960 (4140-7490)	537
Females	11-12	1120 (993-1260)	1230 (1100-1360)	2260 (2070-2410)	3380 (2680-4210)	4480 (3760-5650)	348
Nonsmokers†							
Total	11-12	161 (149-175)	153 (144-169)	296 (262-327)	563 (459-622)	715 (621-980)	1300
Age group							
20-49 years	11-12	175 (157-194)	169 (148-202)	345 (306-384)	622 (524-683)	826 (670-1100)	640
50 years and older	11-12	148 (131-168)	143 (125-161)	254 (214-298)	448 (345-599)	622 (481-966)	660
Gender							
Males	11-12	194 (169-223)	194 (161-217)	337 (285-399)	622 (493-735)	916 (623-1460)	612
Females	11-12	140 (129-151)	138 (124-147)	260 (225-290)	487 (396-580)	644 (580-766)	688

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 10.0.

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Fluorene_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 2-Hydroxyfluorene (creatinine corrected) (2011 – 2012)‡

Metabolite of Fluorene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	1240 (1160-1330)	1370 (1320-1460)	2230 (2040-2460)	3200 (2950-3490)	3940 (3540-4670)	885
Age group							
20-49 years	11-12	1100 (993-1220)	1240 (1050-1350)	1950 (1750-2150)	3080 (2540-3440)	3850 (3210-4390)	530
50 years and older	11-12	1510 (1360-1670)	1750 (1450-1950)	2630 (2300-2930)	3540 (2950-3920)	4120 (3480-5090)	355
Gender							
Males	11-12	1080 (974-1200)	1250 (1030-1370)	1920 (1710-2170)	2860 (2400-3390)	3550 (2950-4020)	537
Females	11-12	1490 (1280-1740)	1750 (1470-1970)	2740 (2110-3080)	3630 (3080-4120)	4390 (3630-4840)	348
Nonsmokers†							
Total	11-12	190 (177-204)	173 (163-184)	265 (248-291)	435 (366-472)	629 (472-890)	1299
Age group							
20-49 years	11-12	193 (178-209)	175 (166-186)	271 (239-303)	443 (349-511)	637 (472-920)	639
50 years and older	11-12	186 (167-207)	168 (145-195)	260 (223-301)	426 (348-484)	624 (450-941)	660
Gender							
Males	11-12	173 (152-197)	147 (132-177)	248 (205-281)	423 (314-511)	542 (424-1320)	611
Females	11-12	204 (192-216)	185 (171-200)	282 (250-312)	446 (374-509)	702 (476-816)	688

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Fluorene_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 3-Hydroxyfluorene (2011 – 2012)‡

Metabolite of Fluorene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	574 (486-677)	670 (525-801)	1270 (1080-1590)	2130 (1900-2530)	2900 (2370-3330)	885
Age group							
20-49 years	11-12	539 (432-674)	638 (496-800)	1210 (1030-1430)	2010 (1730-2440)	2750 (2120-3340)	530
50 years and older	11-12	632 (510-783)	693 (496-945)	1460 (1100-1750)	2400 (1750-2990)	3040 (2440-3970)	355
Gender							
Males	11-12	583 (452-752)	684 (493-951)	1550 (1140-1830)	2440 (1930-2990)	2990 (2390-4560)	537
Females	11-12	561 (499-632)	637 (515-759)	1130 (960-1240)	1810 (1510-2050)	2400 (1930-2830)	348
Nonsmokers†							
Total	11-12	56.9 (51.9-62.5)	56.0 (50.0-60.0)	104 (92.0-117)	195 (169-221)	281 (229-373)	1296
Age group							
20-49 years	11-12	62.1 (55.5-69.5)	59.0 (54.0-70.0)	124 (113-143)	227 (199-267)	347 (267-439)	639
50 years and older	11-12	52.0 (45.4-59.5)	53.0 (45.0-59.0)	83.0 (68.0-102)	153 (116-192)	222 (162-355)	657
Gender							
Males	11-12	68.6 (58.5-80.5)	62.0 (57.0-70.0)	118 (104-148)	223 (164-311)	332 (222-818)	611
Females	11-12	49.1 (44.6-54.2)	50.0 (47.0-56.0)	88.0 (79.0-99.0)	166 (151-183)	260 (195-320)	685

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 10.0.

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Fluorene_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 3-Hydroxyfluorene (creatinine corrected) (2011 – 2012)‡

Metabolite of Fluorene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	634 (575-700)	765 (694-825)	1210 (1110-1330)	1830 (1480-2050)	2060 (1980-2280)	885
Age group							
20-49 years	11-12	565 (500-638)	631 (568-736)	1170 (1020-1240)	1780 (1360-2050)	2050 (1730-2320)	530
50 years and older	11-12	763 (639-911)	964 (844-1030)	1310 (1100-1640)	1840 (1560-2060)	2060 (1690-2420)	355
Gender							
Males	11-12	558 (479-651)	637 (568-754)	1100 (971-1200)	1640 (1290-2050)	2050 (1560-2140)	537
Females	11-12	750 (624-902)	936 (796-1080)	1350 (1130-1680)	1980 (1420-2420)	2330 (2030-2450)	348
Nonsmokers†							
Total	11-12	66.8 (61.6-72.6)	59.3 (54.5-65.4)	98.3 (88.9-107)	174 (149-200)	251 (200-338)	1295
Age group							
20-49 years	11-12	68.5 (62.3-75.3)	58.9 (53.6-67.3)	103 (83.2-117)	182 (148-223)	251 (203-345)	638
50 years and older	11-12	65.2 (57.1-74.4)	60.5 (50.0-70.7)	94.4 (87.5-107)	168 (137-200)	249 (171-372)	657
Gender							
Males	11-12	61.2 (52.3-71.5)	51.9 (48.0-59.7)	86.0 (76.4-103)	149 (113-195)	226 (149-765)	610
Females	11-12	71.7 (65.5-78.5)	65.6 (57.6-75.8)	106 (92.9-127)	193 (163-239)	254 (235-311)	685

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Fluorene_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 9-Hydroxyfluorene (2011 – 2012)‡

Metabolite of Fluorene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	605 (557-657)	658 (553-724)	1190 (1040-1300)	1980 (1700-2470)	3100 (2470-3730)	885
Age group							
20-49 years	11-12	571 (507-643)	621 (504-669)	1110 (915-1220)	1760 (1470-2400)	2590 (2090-3680)	530
50 years and older	11-12	662 (572-766)	742 (553-900)	1350 (1150-1480)	2470 (1780-2840)	3460 (2470-4020)	355
Gender							
Males	11-12	612 (536-698)	658 (453-809)	1190 (999-1400)	2340 (1590-3400)	3460 (2370-4020)	537
Females	11-12	595 (512-692)	642 (529-736)	1190 (903-1440)	1880 (1470-2560)	2590 (1790-3730)	348
Nonsmokers†							
Total	11-12	204 (189-220)	199 (181-222)	381 (341-406)	752 (650-872)	1230 (915-1350)	1300
Age group							
20-49 years	11-12	210 (188-234)	210 (188-248)	402 (350-437)	807 (678-945)	1310 (1010-1340)	640
50 years and older	11-12	198 (169-232)	183 (141-240)	343 (308-388)	714 (524-909)	1010 (720-1780)	660
Gender							
Males	11-12	241 (212-274)	244 (196-285)	433 (387-492)	796 (664-951)	1280 (951-1490)	612
Females	11-12	179 (162-198)	181 (157-198)	322 (290-375)	683 (495-864)	1230 (794-1580)	688

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 10.0.

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Fluorene_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 9-Hydroxyfluorene (creatinine corrected) (2011 – 2012)‡

Metabolite of Fluorene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	669 (609-734)	667 (618-741)	1170 (1100-1280)	1860 (1610-2110)	2630 (2000-3640)	885
Age group							
20-49 years	11-12	598 (513-696)	586 (520-659)	1020 (851-1170)	1730 (1320-2370)	2630 (1650-4950)	530
50 years and older	11-12	799 (720-887)	877 (794-949)	1350 (1160-1610)	2010 (1610-2300)	2570 (2080-2940)	355
Gender							
Males	11-12	586 (518-662)	605 (531-683)	1070 (878-1150)	1610 (1360-1930)	2490 (1820-2910)	537
Females	11-12	795 (707-895)	797 (665-936)	1390 (1190-1600)	2010 (1660-2630)	2700 (2010-3890)	348
Nonsmokers†							
Total	11-12	240 (219-262)	218 (195-244)	359 (326-419)	704 (575-848)	959 (834-1140)	1299
Age group							
20-49 years	11-12	232 (212-253)	208 (187-229)	349 (324-386)	663 (537-908)	1080 (804-1170)	639
50 years and older	11-12	248 (217-284)	230 (193-275)	367 (324-489)	704 (543-917)	921 (783-1080)	660
Gender							
Males	11-12	215 (193-240)	192 (179-212)	315 (280-362)	676 (411-921)	921 (621-1630)	611
Females	11-12	261 (233-292)	243 (208-277)	397 (342-492)	750 (583-914)	984 (901-1140)	688

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Fluorene_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 1-Hydroxyphenanthrene (2011 – 2012)‡

Metabolite of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	197 (178-218)	207 (178-236)	378 (315-434)	577 (526-665)	758 (607-864)	885
Age group							
20-49 years	11-12	198 (173-228)	210 (172-256)	378 (311-427)	569 (511-643)	716 (580-864)	530
50 years and older	11-12	195 (172-220)	200 (157-249)	407 (298-459)	607 (459-809)	772 (543-1170)	355
Gender							
Males	11-12	195 (170-224)	207 (172-236)	398 (313-453)	589 (532-687)	758 (619-820)	537
Females	11-12	199 (173-230)	208 (175-247)	365 (276-453)	526 (387-790)	750 (526-1170)	348
Nonsmokers†							
Total	11-12	114 (106-123)	112 (102-125)	209 (193-230)	356 (307-432)	535 (400-639)	1300
Age group							
20-49 years	11-12	117 (105-131)	123 (103-138)	230 (201-249)	389 (315-466)	541 (443-590)	640
50 years and older	11-12	111 (96.5-127)	105 (93.0-122)	193 (173-221)	322 (271-400)	498 (340-874)	660
Gender							
Males	11-12	126 (113-140)	127 (106-141)	221 (198-253)	356 (302-437)	498 (375-781)	612
Females	11-12	106 (95.1-117)	104 (94.0-110)	197 (174-232)	356 (290-446)	540 (375-639)	688

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 10.0.

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 1-Hydroxyphenanthrene (creatinine corrected) (2011 – 2012)‡

Metabolite of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	218 (204-233)	213 (197-244)	328 (303-360)	492 (426-543)	583 (543-609)	885
Age group							
20-49 years	11-12	208 (193-223)	204 (178-234)	313 (292-340)	455 (394-492)	531 (474-658)	530
50 years and older	11-12	235 (212-260)	238 (211-270)	357 (289-481)	543 (426-583)	583 (543-691)	355
Gender							
Males	11-12	187 (171-204)	181 (159-210)	283 (234-322)	383 (360-455)	492 (409-583)	537
Females	11-12	266 (243-291)	267 (239-300)	416 (326-500)	543 (500-594)	658 (562-795)	348
Nonsmokers†							
Total	11-12	134 (123-146)	126 (113-134)	200 (178-218)	335 (269-413)	498 (384-655)	1299
Age group							
20-49 years	11-12	130 (118-142)	122 (108-133)	195 (167-218)	303 (244-384)	473 (332-598)	639
50 years and older	11-12	139 (123-157)	129 (112-145)	206 (175-236)	340 (272-460)	508 (413-683)	660
Gender							
Males	11-12	112 (102-122)	100 (91.0-112)	157 (137-175)	247 (192-367)	413 (247-598)	611
Females	11-12	154 (136-175)	143 (126-162)	221 (200-254)	352 (288-495)	549 (432-831)	688

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 2-Hydroxyphenanthrene (2011 – 2012)‡

Metabolite of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	112 (102-122)	109 (102-130)	205 (184-228)	334 (297-360)	389 (371-466)	884
Age group							
20-49 years	11-12	109 (95.7-124)	108 (96.0-130)	202 (164-228)	304 (258-349)	385 (353-489)	530
50 years and older	11-12	117 (105-129)	119 (94.0-149)	219 (199-247)	360 (287-374)	398 (366-498)	354
Gender							
Males	11-12	120 (105-136)	130 (105-151)	224 (197-260)	360 (292-377)	417 (374-489)	537
Females	11-12	102 (90.4-116)	106 (88.0-119)	185 (151-213)	263 (235-310)	357 (301-478)	347
Nonsmokers†							
Total	11-12	53.2 (49.5-57.2)	52.0 (48.0-57.0)	93.0 (83.0-103)	170 (147-195)	264 (198-306)	1297
Age group							
20-49 years	11-12	57.1 (52.1-62.5)	58.0 (52.0-66.0)	103 (93.0-114)	179 (164-202)	265 (209-331)	640
50 years and older	11-12	49.4 (42.9-57.0)	48.0 (41.0-56.0)	82.0 (68.0-95.0)	141 (114-235)	262 (141-349)	657
Gender							
Males	11-12	65.3 (57.6-74.0)	65.0 (53.0-76.0)	112 (96.0-126)	206 (168-247)	275 (209-384)	611
Females	11-12	45.3 (41.9-49.1)	46.0 (42.0-49.0)	75.0 (67.0-89.0)	137 (112-175)	226 (158-303)	686

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 10.0.

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 2-Hydroxyphenanthrene (creatinine corrected) (2011 – 2012)‡

Metabolite of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	124 (117-131)	127 (117-132)	193 (175-207)	285 (247-318)	365 (307-425)	884
Age group							
20-49 years	11-12	114 (105-124)	112 (104-120)	178 (162-198)	261 (234-295)	365 (261-538)	530
50 years and older	11-12	140 (129-153)	144 (132-158)	207 (188-243)	318 (243-356)	356 (293-432)	354
Gender							
Males	11-12	115 (106-124)	116 (101-129)	173 (159-180)	264 (206-321)	385 (249-432)	537
Females	11-12	137 (121-155)	142 (126-159)	220 (191-245)	303 (253-334)	356 (307-503)	347
Nonsmokers†							
Total	11-12	62.4 (57.7-67.6)	57.1 (53.3-60.5)	92.3 (78.9-101)	154 (120-182)	213 (163-282)	1296
Age group							
20-49 years	11-12	62.9 (58.6-67.5)	59.3 (53.7-62.9)	91.7 (80.0-101)	145 (113-173)	188 (152-284)	639
50 years and older	11-12	62.0 (54.4-70.6)	56.7 (48.7-64.8)	92.3 (73.9-110)	156 (121-203)	218 (156-303)	657
Gender							
Males	11-12	58.1 (52.1-64.8)	52.6 (47.9-56.3)	85.5 (70.1-103)	146 (110-200)	200 (145-281)	610
Females	11-12	66.0 (59.8-72.9)	61.5 (57.1-68.2)	93.1 (84.1-105)	156 (114-188)	226 (163-292)	686

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 3-Hydroxyphenanthrene (2011 – 2012)‡

Metabolite of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	138 (120-158)	143 (123-162)	265 (220-340)	517 (444-549)	633 (552-678)	885
Age group							
20-49 years	11-12	136 (114-164)	143 (115-168)	264 (207-325)	519 (382-593)	651 (563-724)	530
50 years and older	11-12	140 (122-160)	151 (120-184)	269 (223-369)	497 (398-550)	622 (495-784)	355
Gender							
Males	11-12	147 (123-176)	161 (123-201)	313 (253-382)	549 (458-622)	673 (622-784)	537
Females	11-12	126 (109-145)	128 (109-150)	242 (183-269)	385 (297-483)	519 (401-687)	348
Nonsmokers†							
Total	11-12	48.0 (44.2-52.2)	47.0 (42.0-54.0)	88.0 (79.0-100)	165 (135-193)	229 (190-284)	1299
Age group							
20-49 years	11-12	51.8 (46.7-57.4)	54.0 (47.0-61.0)	103 (90.0-118)	182 (165-202)	231 (202-325)	640
50 years and older	11-12	44.4 (38.1-51.8)	44.0 (35.0-54.0)	78.0 (63.0-91.0)	135 (100-186)	221 (146-282)	659
Gender							
Males	11-12	57.9 (49.8-67.4)	56.0 (47.0-67.0)	106 (82.0-132)	189 (149-251)	261 (195-475)	612
Females	11-12	41.5 (38.0-45.2)	40.0 (37.0-45.0)	80.0 (67.0-87.0)	135 (109-173)	206 (173-217)	687

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 10.0.

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 3-Hydroxyphenanthrene (creatinine corrected) (2011 – 2012)‡

Metabolite of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	152 (143-162)	162 (150-173)	255 (239-277)	370 (350-410)	467 (416-503)	885
Age group							
20-49 years	11-12	143 (129-158)	147 (129-167)	244 (214-258)	359 (304-410)	422 (375-525)	530
50 years and older	11-12	169 (155-183)	189 (161-214)	289 (259-313)	427 (348-460)	474 (407-560)	355
Gender							
Males	11-12	141 (130-153)	150 (129-166)	231 (217-253)	354 (324-406)	467 (409-474)	537
Females	11-12	168 (145-194)	181 (151-210)	278 (246-329)	407 (361-427)	471 (410-667)	348
Nonsmokers†							
Total	11-12	56.4 (52.0-61.3)	52.1 (48.2-56.1)	82.1 (73.8-95.2)	148 (121-168)	206 (159-300)	1298
Age group							
20-49 years	11-12	57.1 (52.7-61.8)	51.9 (47.2-56.8)	81.8 (70.3-94.6)	150 (118-173)	203 (163-250)	639
50 years and older	11-12	55.8 (48.7-63.8)	52.2 (44.5-60.3)	82.8 (69.8-103)	147 (114-177)	222 (148-338)	659
Gender							
Males	11-12	51.6 (45.5-58.6)	46.3 (41.4-52.9)	76.4 (61.6-93.6)	140 (102-163)	188 (139-338)	611
Females	11-12	60.5 (54.5-67.2)	55.8 (50.9-61.6)	87.0 (75.8-105)	149 (122-178)	231 (151-334)	687

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 4-Hydroxyphenanthrene (2011 – 2012)‡

Metabolite of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	38.2 (35.3-41.3)	42.0 (35.0-46.0)	74.0 (66.0-79.0)	116 (102-136)	156 (144-178)	874
Age group							
20-49 years	11-12	36.9 (32.9-41.3)	38.0 (31.0-46.0)	73.0 (61.0-79.0)	109 (99.0-126)	155 (126-179)	525
50 years and older	11-12	40.3 (36.1-45.1)	45.0 (38.0-50.0)	77.0 (66.0-95.0)	126 (106-148)	156 (124-201)	349
Gender							
Males	11-12	36.3 (31.6-41.8)	36.0 (31.0-45.0)	74.0 (64.0-82.0)	119 (102-148)	169 (126-189)	531
Females	11-12	40.7 (34.7-47.8)	47.0 (38.0-52.0)	74.0 (63.0-84.0)	113 (90.0-146)	151 (117-182)	343
Nonsmokers†							
Total	11-12	17.4 (16.3-18.7)	16.0 (14.0-17.0)	30.0 (27.0-33.0)	53.0 (44.0-67.0)	84.0 (72.0-96.0)	1296
Age group							
20-49 years	11-12	19.1 (17.3-21.1)	18.0 (15.0-22.0)	34.0 (30.0-39.0)	63.0 (51.0-72.0)	84.0 (67.0-116)	639
50 years and older	11-12	15.8 (14.0-17.9)	14.0 (12.0-17.0)	26.0 (23.0-29.0)	40.0 (34.0-65.0)	81.0 (44.0-134)	657
Gender							
Males	11-12	19.4 (17.0-22.0)	19.0 (16.0-23.0)	33.0 (29.0-35.0)	60.0 (44.0-79.0)	84.0 (67.0-108)	610
Females	11-12	16.0 (14.7-17.5)	14.0 (12.0-16.0)	26.0 (22.0-31.0)	47.0 (40.0-65.0)	82.0 (52.0-134)	686

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 10.0.

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 4-Hydroxyphenanthrene (creatinine corrected) (2011 – 2012)‡

Metabolite of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	42.0 (38.8-45.5)	44.4 (40.7-46.8)	76.5 (63.2-88.9)	124 (105-143)	153 (142-172)	874
Age group							
20-49 years	11-12	38.6 (34.7-42.9)	40.4 (36.8-44.6)	64.5 (59.3-80.0)	118 (95.5-133)	143 (123-198)	525
50 years and older	11-12	48.2 (43.4-53.6)	53.3 (45.7-59.7)	90.1 (77.4-103)	143 (103-158)	154 (124-175)	349
Gender							
Males	11-12	34.8 (30.4-39.8)	37.8 (35.3-40.9)	60.8 (49.5-72.2)	100 (82.3-112)	127 (100-172)	531
Females	11-12	53.9 (45.3-64.2)	59.0 (47.2-63.4)	103 (75.8-124)	143 (121-159)	159 (143-228)	343
Nonsmokers†							
Total	11-12	20.4 (19.0-22.0)	19.7 (18.4-21.1)	30.2 (26.4-33.8)	50.7 (41.8-65.0)	79.6 (51.9-117)	1295
Age group							
20-49 years	11-12	20.9 (19.2-22.8)	20.3 (19.2-22.1)	30.9 (26.3-34.7)	51.5 (42.7-66.7)	80.5 (54.6-117)	638
50 years and older	11-12	19.9 (17.8-22.2)	18.5 (17.6-20.9)	29.6 (26.1-32.7)	48.8 (37.5-65.0)	79.6 (47.5-111)	657
Gender							
Males	11-12	17.3 (15.8-18.9)	17.1 (15.1-18.3)	25.1 (23.0-27.3)	41.2 (31.9-54.7)	59.7 (39.7-111)	609
Females	11-12	23.3 (21.2-25.6)	22.2 (20.3-24.4)	34.5 (29.6-38.6)	54.9 (47.1-79.6)	88.8 (55.3-135)	686

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 1-Hydroxypyrene (2011 – 2012)‡

Metabolite of Pyrene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	234 (202-273)	239 (198-295)	483 (387-555)	773 (693-888)	1160 (922-1240)	885
Age group							
20-49 years	11-12	237 (196-286)	243 (198-303)	460 (364-604)	773 (652-1010)	1180 (832-1440)	530
50 years and older	11-12	231 (196-271)	232 (162-295)	497 (358-582)	775 (603-1100)	1120 (756-1400)	355
Gender							
Males	11-12	238 (193-293)	238 (193-321)	522 (415-636)	835 (756-1080)	1230 (1020-1380)	537
Females	11-12	230 (200-264)	243 (194-278)	423 (342-513)	664 (543-828)	882 (685-1180)	348
Nonsmokers†							
Total	11-12	81.5 (75.1-88.5)	83.0 (75.0-92.0)	147 (135-168)	262 (227-306)	395 (311-450)	1297
Age group							
20-49 years	11-12	96.1 (84.9-109)	99.0 (83.0-113)	183 (160-217)	304 (262-365)	436 (349-482)	639
50 years and older	11-12	68.5 (61.1-76.8)	71.0 (59.0-86.0)	121 (101-135)	196 (167-222)	307 (206-424)	658
Gender							
Males	11-12	92.1 (82.5-103)	93.0 (83.0-100)	169 (143-183)	299 (227-424)	450 (316-599)	611
Females	11-12	74.1 (67.5-81.3)	75.0 (64.0-85.0)	136 (120-154)	238 (196-293)	330 (285-381)	686

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 10.0.

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Pyrene_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 1-Hydroxypyrene (creatinine corrected) (2011 – 2012)‡

Metabolite of Pyrene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	259 (240-280)	264 (253-281)	429 (387-458)	661 (547-763)	887 (714-996)	885
Age group							
20-49 years	11-12	248 (224-274)	251 (218-277)	395 (360-453)	653 (525-769)	838 (700-996)	530
50 years and older	11-12	278 (248-312)	296 (264-334)	448 (386-518)	694 (556-887)	899 (748-1070)	355
Gender							
Males	11-12	228 (204-255)	226 (206-261)	378 (330-418)	546 (458-703)	804 (580-993)	537
Females	11-12	307 (266-354)	323 (288-376)	466 (413-572)	743 (589-887)	888 (700-1040)	348
Nonsmokers†							
Total	11-12	96.7 (90.8-103)	92.4 (87.3-100)	149 (141-160)	248 (214-280)	341 (280-460)	1296
Age group							
20-49 years	11-12	106 (100-113)	104 (94.2-113)	163 (147-184)	256 (225-289)	329 (295-385)	638
50 years and older	11-12	87.6 (78.0-98.4)	85.5 (75.0-91.6)	127 (116-146)	220 (183-307)	401 (249-855)	658
Gender							
Males	11-12	82.3 (74.0-91.7)	80.7 (72.3-85.7)	122 (109-136)	208 (162-298)	323 (243-482)	610
Females	11-12	110 (101-119)	104 (93.2-118)	167 (153-182)	258 (224-289)	362 (307-438)	686

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Pyrene_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 1-Hydroxynaphthalene (1-Naphthol) (2011 – 2012)‡

Metabolite of Naphthalene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	9.00 (7.76-10.4)	10.6 (8.57-11.9)	19.8 (17.0-22.1)	34.6 (27.9-36.5)	42.6 (35.7-49.0)	885
Age group							
20-49 years	11-12	8.18 (6.53-10.3)	9.97 (7.63-11.5)	18.3 (14.8-21.7)	27.6 (24.2-35.2)	37.2 (32.3-48.5)	530
50 years and older	11-12	10.5 (8.84-12.4)	11.8 (8.52-14.1)	22.7 (18.5-26.0)	38.8 (27.2-43.7)	44.5 (38.8-128)	355
Gender							
Males	11-12	8.79 (6.99-11.0)	10.9 (8.54-12.4)	21.3 (17.2-24.2)	35.7 (27.4-38.8)	42.6 (33.2-49.0)	537
Females	11-12	9.28 (8.16-10.6)	9.97 (8.08-12.1)	18.5 (16.1-21.1)	30.7 (24.7-35.2)	42.2 (35.1-58.5)	348
Nonsmokers†							
Total	11-12	1.17 (1.08-1.27)	1.09 (.954-1.20)	2.31 (2.11-2.48)	5.40 (4.36-6.12)	9.40 (7.26-11.6)	1300
Age group							
20-49 years	11-12	1.00 (.931-1.08)	.931 (.805-1.09)	1.92 (1.77-2.29)	4.44 (3.30-5.79)	7.21 (5.79-9.93)	640
50 years and older	11-12	1.39 (1.20-1.61)	1.25 (.954-1.59)	2.64 (2.29-3.05)	5.83 (4.58-8.21)	11.6 (8.84-16.0)	660
Gender							
Males	11-12	1.31 (1.14-1.52)	1.20 (.950-1.52)	2.42 (2.11-2.89)	5.73 (4.12-6.91)	8.21 (6.63-16.0)	612
Females	11-12	1.07 (.920-1.25)	.976 (.831-1.15)	2.16 (1.85-2.50)	4.97 (3.51-6.72)	11.0 (6.34-12.9)	688

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.044.

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Naphthalene_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 1-Hydroxynaphthalene (1-Naphthol) (creatinine corrected) (2011 – 2012)‡

Metabolite of Naphthalene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	9.95 (8.94-11.1)	12.0 (10.3-13.1)	18.4 (16.4-19.8)	29.4 (24.2-36.4)	38.8 (33.0-46.1)	885
Age group							
20-49 years	11-12	8.56 (7.40-9.91)	9.49 (8.34-11.3)	15.8 (14.0-18.4)	26.4 (20.7-35.2)	37.2 (30.0-42.0)	530
50 years and older	11-12	12.6 (10.6-15.1)	13.5 (13.2-15.5)	20.2 (18.1-24.2)	33.7 (24.2-40.5)	42.2 (32.3-124)	355
Gender							
Males	11-12	8.41 (7.34-9.63)	9.46 (8.12-11.9)	14.3 (13.4-16.7)	22.5 (19.9-26.1)	32.8 (26.1-38.0)	537
Females	11-12	12.4 (10.2-15.0)	14.7 (13.1-15.9)	21.4 (18.6-28.7)	36.6 (29.3-44.0)	44.0 (36.6-50.3)	348
Nonsmokers†							
Total	11-12	1.38 (1.25-1.52)	1.18 (1.05-1.35)	2.44 (2.05-2.88)	5.46 (4.61-6.86)	9.35 (7.80-12.4)	1299
Age group							
20-49 years	11-12	1.10 (.993-1.22)	.998 (.849-1.16)	1.92 (1.75-2.21)	3.67 (3.17-4.67)	6.19 (4.97-7.70)	639
50 years and older	11-12	1.74 (1.52-1.99)	1.49 (1.17-1.83)	3.15 (2.50-4.16)	7.55 (5.54-11.4)	15.8 (10.6-19.4)	660
Gender							
Males	11-12	1.17 (1.02-1.34)	.963 (.790-1.20)	1.98 (1.70-2.45)	4.07 (3.26-6.19)	8.48 (6.25-11.8)	611
Females	11-12	1.57 (1.35-1.82)	1.41 (1.17-1.66)	2.91 (2.28-3.42)	5.95 (5.23-7.65)	10.6 (7.80-12.9)	688

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Naphthalene_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 2-Hydroxynaphthalene (2-Naphthol) (2011 – 2012)‡

Metabolite of Naphthalene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	11.9 (10.6-13.4)	13.0 (11.2-14.5)	24.0 (20.5-27.7)	36.1 (31.2-43.7)	49.4 (43.5-52.5)	885
Age group							
20-49 years	11-12	11.6 (9.84-13.6)	13.3 (10.6-15.2)	23.4 (19.1-27.7)	32.8 (29.8-38.5)	45.3 (35.5-51.6)	530
50 years and older	11-12	12.4 (10.5-14.8)	12.7 (10.3-16.8)	26.0 (19.8-29.7)	43.6 (35.9-51.1)	52.8 (36.1-71.2)	355
Gender							
Males	11-12	11.8 (9.86-14.1)	13.0 (10.7-16.0)	26.0 (21.4-29.2)	38.5 (31.2-50.4)	51.6 (36.6-67.3)	537
Females	11-12	12.0 (10.8-13.4)	12.9 (10.7-14.5)	21.2 (17.9-26.0)	35.9 (29.1-38.4)	41.1 (36.1-49.6)	348
Nonsmokers†							
Total	11-12	3.12 (2.81-3.46)	3.17 (2.76-3.67)	6.35 (5.52-7.54)	13.1 (11.1-15.2)	18.3 (15.5-20.5)	1300
Age group							
20-49 years	11-12	3.62 (3.11-4.22)	3.75 (3.08-4.44)	8.57 (6.20-10.7)	15.2 (12.0-17.9)	20.5 (16.3-23.0)	640
50 years and older	11-12	2.67 (2.35-3.05)	2.57 (2.31-3.25)	5.27 (4.41-6.05)	10.6 (8.51-11.5)	14.8 (11.5-20.0)	660
Gender							
Males	11-12	3.30 (2.95-3.69)	3.41 (2.78-4.06)	6.10 (5.35-7.54)	11.5 (10.7-14.3)	15.8 (11.9-20.0)	612
Females	11-12	2.99 (2.57-3.49)	2.89 (2.46-3.74)	6.74 (5.29-8.62)	13.9 (11.7-16.2)	19.5 (15.6-21.8)	688

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.042.

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Naphthalene_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 2-Hydroxynaphthalene (2-Naphthol) (creatinine corrected) (2011 – 2012)‡

Metabolite of Naphthalene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	13.2 (12.4-14.0)	14.2 (13.4-14.9)	21.2 (19.6-22.1)	28.7 (25.8-32.0)	34.7 (30.8-39.4)	885
Age group							
20-49 years	11-12	12.1 (11.0-13.3)	13.1 (11.8-14.2)	19.2 (18.1-20.7)	28.0 (23.6-31.2)	33.9 (28.6-41.9)	530
50 years and older	11-12	15.0 (13.4-16.8)	17.4 (15.1-18.4)	23.5 (21.8-24.5)	31.3 (25.8-34.3)	35.7 (28.8-39.8)	355
Gender							
Males	11-12	11.3 (10.4-12.3)	12.9 (11.3-13.7)	18.3 (15.5-19.6)	23.7 (21.4-28.0)	29.0 (24.3-34.6)	537
Females	11-12	16.1 (14.1-18.4)	17.7 (14.7-20.8)	24.3 (21.4-28.4)	33.2 (26.9-39.4)	39.4 (34.3-43.8)	348
Nonsmokers†							
Total	11-12	3.67 (3.44-3.92)	3.40 (3.04-3.84)	6.56 (5.94-7.27)	11.9 (10.0-12.6)	15.5 (13.4-17.9)	1299
Age group							
20-49 years	11-12	4.01 (3.57-4.50)	3.74 (3.20-4.32)	7.48 (6.56-8.70)	12.6 (11.1-13.6)	16.4 (13.9-18.9)	639
50 years and older	11-12	3.35 (3.00-3.75)	3.18 (2.57-3.57)	5.73 (4.66-6.86)	9.63 (8.57-11.4)	13.0 (10.5-17.4)	660
Gender							
Males	11-12	2.95 (2.67-3.25)	2.77 (2.46-2.99)	4.86 (4.17-5.76)	8.72 (7.23-9.39)	11.4 (9.19-14.6)	611
Females	11-12	4.37 (3.94-4.84)	4.18 (3.40-5.01)	7.64 (7.04-8.64)	13.0 (11.9-14.9)	17.7 (15.5-20.3)	688

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Naphthalene_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 3-Amino-1,4-dimethyl-5H-pyrido[4,3-b]indole (Trp-P-1) (2013 – 2014)

Geometric mean and selected percentiles of concentrations (in ng/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	919
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	558
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	361
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	499
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	420
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	1446
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	759
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	687
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	655
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	791

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#).
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.79.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 3-Amino-1,4-dimethyl-5H-pyrido[4,3-b]indole (Trp-P-1) (creatinine corrected) (2013 – 2014)

Geometric mean and selected percentiles of concentrations (in ng/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	918
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	557
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	361
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	498
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	420
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	1445
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	759
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	686
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	654
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	791

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#).

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 2-Amino-3-methyl-9H-pyrido[2,3-b]indole (MeA- α -C) (2013 – 2014)

Geometric mean and selected percentiles of concentrations (in ng/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	1.07 (.910-1.25)	1.19 (.900-1.47)	3.20 (2.70-3.90)	5.72 (4.95-7.28)	8.88 (7.28-11.3)	920
18-49 years	13-14	1.03 (.808-1.32)	1.14 (.610-1.53)	3.19 (2.33-4.02)	5.80 (4.62-8.44)	10.6 (6.25-16.9)	561
50 years and older	13-14	1.15 (.951-1.39)	1.43 (.890-1.94)	3.29 (2.73-3.98)	5.41 (4.70-6.64)	7.52 (5.49-9.62)	359
Gender							
Males	13-14	1.10 (.906-1.35)	1.29 (.800-1.58)	3.34 (2.82-3.98)	6.23 (4.68-9.45)	10.4 (6.64-15.3)	498
Females	13-14	1.03 (.853-1.25)	1.16 (.770-1.57)	3.08 (2.34-3.86)	5.48 (4.87-7.26)	8.26 (6.82-9.62)	422
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	.430 (<LOD-.580)	1444
18-49 years	13-14	*	< LOD	< LOD	< LOD	.540 (<LOD-.880)	760
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	684
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	.520 (<LOD-.880)	654
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	790

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#).

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.33.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 2-Amino-3-methyl-9H-pyrido[2,3-b]indole (MeA- α -C) (creatinine corrected) (2013 – 2014)

Geometric mean and selected percentiles of concentrations (in ng/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	1.13 (.951-1.35)	1.27 (.972-1.58)	3.95 (2.97-4.86)	7.89 (6.16-9.56)	10.0 (8.75-12.5)	919
18-49 years	13-14	.995 (.774-1.28)	1.10 (.662-1.52)	3.19 (2.33-4.89)	7.52 (5.76-9.53)	10.0 (8.59-11.9)	560
50 years and older	13-14	1.49 (1.25-1.79)	1.85 (1.38-2.49)	4.75 (3.93-5.88)	8.07 (6.16-10.0)	10.0 (7.94-16.6)	359
Gender							
Males	13-14	.998 (.823-1.21)	1.13 (.807-1.46)	3.18 (2.56-4.10)	7.11 (5.27-9.29)	9.67 (7.67-15.4)	497
Females	13-14	1.29 (1.04-1.59)	1.39 (1.05-2.04)	4.69 (3.72-5.70)	8.11 (6.80-10.0)	10.8 (8.63-16.6)	422
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	1.28 (<LOD-1.64)	1443
18-49 years	13-14	*	< LOD	< LOD	< LOD	1.21 (<LOD-1.29)	760
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	683
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	1.00 (<LOD-1.29)	653
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	790

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#).

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 2-Amino-1-methyl-6-phenylimidazo[4,5-b]pyridine (PhIP) (2013 – 2014)

Geometric mean and selected percentiles of concentrations (in ng/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	1.44 (1.01-1.98)	6.38 (5.21-7.94)	15.3 (9.07-26.2)	921
18-49 years	13-14	*	.360 (<LOD-.480)	1.49 (.990-2.52)	6.93 (4.59-11.9)	17.7 (8.70-36.7)	561
50 years and older	13-14	*	< LOD	1.22 (.670-2.30)	6.15 (2.77-7.94)	9.10 (6.15-34.2)	360
Gender							
Males	13-14	*	< LOD	1.44 (1.00-1.88)	6.06 (3.83-7.94)	13.2 (7.68-23.9)	499
Females	13-14	*	< LOD	1.45 (.850-2.77)	6.93 (3.99-14.8)	20.1 (7.10-42.6)	422
Nonsmokers†							
Total	13-14	*	.530 (.450-.590)	2.30 (1.83-2.92)	8.27 (6.70-10.6)	17.0 (14.2-21.1)	1446
18-49 years	13-14	.949 (.844-1.07)	.600 (.510-.730)	2.35 (1.95-3.04)	9.67 (7.10-13.2)	18.6 (13.8-33.1)	759
50 years and older	13-14	*	.430 (<LOD-.560)	2.04 (1.26-3.32)	7.39 (4.94-11.3)	14.9 (11.3-21.1)	687
Gender							
Males	13-14	1.06 (.915-1.24)	.720 (.590-.880)	3.22 (2.19-4.53)	10.4 (6.77-15.9)	20.0 (13.9-37.7)	654
Females	13-14	*	.390 (<LOD-.510)	1.73 (1.29-2.12)	6.97 (4.82-9.20)	14.2 (8.62-26.6)	792

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#).
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.34.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 2-Amino-1-methyl-6-phenylimidazo[4,5-b]pyridine (PhIP) (creatinine corrected) (2013 – 2014)

Geometric mean and selected percentiles of concentrations (in ng/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	1.51 (1.26-1.84)	5.39 (3.49-7.64)	12.2 (7.66-15.4)	920
18-49 years	13-14	*	.534 (<LOD-.649)	1.58 (1.20-1.84)	5.65 (2.99-9.05)	12.2 (6.77-15.6)	560
50 years and older	13-14	*	< LOD	1.50 (1.06-2.74)	5.39 (3.57-10.2)	12.3 (6.26-18.5)	360
Gender							
Males	13-14	*	< LOD	1.44 (1.04-1.80)	4.84 (2.99-7.07)	11.3 (5.65-15.4)	498
Females	13-14	*	< LOD	1.71 (1.09-2.51)	6.79 (3.32-10.6)	12.3 (7.59-15.3)	422
Nonsmokers†							
Total	13-14	*	.754 (.702-.802)	2.49 (1.98-3.08)	9.66 (7.78-11.9)	18.5 (13.9-27.6)	1445
18-49 years	13-14	1.05 (.935-1.19)	.770 (.669-.889)	2.38 (1.96-3.13)	10.2 (6.69-12.9)	19.5 (13.5-30.3)	759
50 years and older	13-14	*	.749 (<LOD-.857)	2.52 (1.71-3.86)	9.66 (7.27-12.2)	18.3 (12.2-27.1)	686
Gender							
Males	13-14	1.04 (.908-1.20)	.749 (.663-.881)	2.91 (1.77-4.62)	10.1 (6.56-13.5)	18.3 (11.9-32.1)	653
Females	13-14	*	.774 (<LOD-.857)	2.18 (1.85-2.73)	9.49 (6.88-13.7)	19.1 (12.2-31.7)	792

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#).

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 2-Amino-9H-pyrido[2,3-b]indole (A- α -C) (2013 – 2014)

Geometric mean and selected percentiles of concentrations (in ng/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	19.7 (15.7-24.7)	27.3 (22.6-32.1)	60.9 (53.0-68.8)	97.7 (88.1-128)	149 (107-206)	918
18-49 years	13-14	18.3 (13.2-25.5)	26.1 (17.4-35.0)	63.5 (51.0-74.6)	107 (83.4-155)	159 (128-226)	558
50 years and older	13-14	23.0 (19.1-27.6)	30.9 (21.9-42.2)	57.4 (47.6-70.2)	91.4 (78.1-104)	120 (94.8-139)	360
Gender							
Males	13-14	18.0 (13.2-24.6)	25.6 (17.0-35.4)	56.3 (47.5-66.2)	104 (82.0-132)	157 (107-227)	499
Females	13-14	21.6 (16.7-28.0)	28.0 (20.3-40.4)	62.7 (55.5-74.6)	96.0 (83.2-128)	139 (97.7-205)	419
Nonsmokers†							
Total	13-14	*	< LOD	1.13 (.960-1.34)	3.38 (2.63-4.59)	8.39 (5.40-10.8)	1444
18-49 years	13-14	*	< LOD	1.41 (1.11-1.63)	4.71 (3.32-5.75)	10.7 (6.54-15.7)	759
50 years and older	13-14	*	< LOD	.950 (.700-1.27)	2.30 (1.56-3.76)	5.20 (3.72-8.39)	685
Gender							
Males	13-14	*	< LOD	1.43 (1.13-1.68)	4.44 (2.71-6.29)	10.2 (5.75-15.3)	653
Females	13-14	*	< LOD	.920 (.800-1.15)	2.64 (1.87-3.91)	5.77 (4.05-9.50)	791

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#).
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.62.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 2-Amino-9H-pyrido[2,3-b]indole (A- α -C) (creatinine corrected) (2013 – 2014)

Geometric mean and selected percentiles of concentrations (in ng/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	20.9 (16.3-26.8)	29.9 (23.3-34.7)	69.3 (59.7-80.4)	122 (96.3-161)	175 (125-253)	917
18-49 years	13-14	17.7 (12.9-24.3)	23.6 (17.0-32.6)	66.2 (49.5-75.4)	122 (88.2-167)	175 (127-255)	557
50 years and older	13-14	29.6 (23.5-37.2)	39.6 (34.2-50.3)	80.0 (65.0-91.4)	131 (98.3-163)	181 (109-259)	360
Gender							
Males	13-14	16.3 (12.0-22.2)	22.7 (16.7-32.2)	56.4 (41.5-69.9)	99.4 (82.2-127)	152 (102-267)	498
Females	13-14	27.1 (20.4-36.0)	37.5 (29.8-47.5)	84.6 (68.1-102)	146 (91.0-186)	182 (146-259)	419
Nonsmokers†							
Total	13-14	*	< LOD	1.63 (1.45-1.88)	4.17 (3.14-5.21)	8.65 (5.82-11.6)	1443
18-49 years	13-14	*	< LOD	1.78 (1.52-2.00)	4.39 (3.08-5.75)	11.0 (5.82-13.1)	759
50 years and older	13-14	*	< LOD	1.53 (1.26-1.91)	3.78 (2.58-5.94)	7.77 (4.89-10.7)	684
Gender							
Males	13-14	*	< LOD	1.42 (1.26-1.65)	4.40 (3.03-5.57)	9.03 (5.50-14.9)	652
Females	13-14	*	< LOD	1.84 (1.53-2.15)	4.00 (2.96-4.89)	7.85 (4.89-11.6)	791

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#).

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 2-Amino-3-methyl-3H-imidazo[4,5-f]quinolone (IQ) (2013 – 2014)

Geometric mean and selected percentiles of concentrations (in ng/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	921
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	561
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	360
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	499
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	422
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	1447
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	760
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	687
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	655
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	792

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#).
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.37.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 2-Amino-3-methyl-3H-imidazo[4,5-f]quinolone (IQ) (creatinine corrected) (2013 – 2014)

Geometric mean and selected percentiles of concentrations (in ng/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	920
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	560
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	360
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	498
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	422
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	1446
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	760
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	686
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	654
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	792

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#).

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated; proportion of results below limit of detection was too high to provide a valid result.

Urinary 2-Amino-6-methyldipyrido[1,2-a:3',2'-d]imidazole (Glu-P-1) (2013 – 2014)

Geometric mean and selected percentiles of concentrations (in ng/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	922
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	561
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	361
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	500
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	422
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	1447
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	760
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	687
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	655
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	792

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#).
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.31.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 2-Amino-6-methyldipyrido[1,2-a:3',2'-d]imidazole (Glu-P-1) (creatinine corrected) (2013 – 2014)

Geometric mean and selected percentiles of concentrations (in ng/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	921
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	560
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	361
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	499
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	422
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	1446
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	760
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	686
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	654
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	792

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#).

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated; proportion of results below limit of detection was too high to provide a valid result.

Urinary 2-Aminodipyrido[1,2-a:3',2'-d] imidazole (GLU-P-2) (2013 – 2014)

Geometric mean and selected percentiles of concentrations (in ng/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	920
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	560
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	360
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	498
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	422
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	1447
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	760
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	687
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	655
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	792

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#).
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.83.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 2-Aminodipyrido[1,2-a:3',2'-d] imidazole (GLU-P-2) (creatinine corrected) (2013 – 2014)

Geometric mean and selected percentiles of concentrations (in ng/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	919
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	559
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	360
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	497
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	422
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	1446
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	760
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	686
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	654
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	792

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#).

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary Harman (2013 – 2014)

Geometric mean and selected percentiles of concentrations (in ng/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	203 (181-228)	198 (172-229)	351 (301-425)	714 (563-886)	1010 (876-1380)	921
18-49 years	13-14	204 (171-242)	201 (168-238)	340 (290-376)	714 (502-921)	1020 (757-1860)	560
50 years and older	13-14	202 (178-229)	193 (162-229)	433 (295-519)	713 (553-937)	959 (759-1190)	361
Gender							
Males	13-14	200 (172-233)	178 (152-212)	350 (276-452)	756 (520-996)	1190 (821-1800)	500
Females	13-14	206 (178-239)	223 (184-254)	351 (295-439)	714 (554-893)	931 (821-1080)	421
Nonsmokers†							
Total	13-14	129 (120-139)	115 (107-124)	233 (211-260)	541 (449-607)	811 (748-1060)	1447
18-49 years	13-14	115 (107-124)	104 (94.8-110)	203 (178-227)	404 (355-470)	751 (538-913)	760
50 years and older	13-14	147 (133-162)	135 (118-148)	286 (237-342)	628 (541-760)	914 (683-1380)	687
Gender							
Males	13-14	137 (121-155)	120 (108-144)	243 (202-310)	539 (386-642)	782 (608-1230)	655
Females	13-14	123 (111-136)	108 (95.4-119)	224 (190-268)	546 (412-734)	853 (683-1280)	792

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#).
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 4.59.

Urinary Harman (creatinine corrected) (2013 – 2014)

Geometric mean and selected percentiles of concentrations (in ng/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	215 (200-230)	209 (186-230)	388 (347-412)	665 (578-718)	895 (713-1110)	920
18-49 years	13-14	197 (175-221)	185 (160-224)	345 (311-389)	595 (468-713)	829 (608-1100)	559
50 years and older	13-14	260 (226-299)	245 (206-287)	440 (357-568)	695 (589-1040)	1050 (718-1310)	361
Gender							
Males	13-14	181 (160-203)	166 (145-195)	328 (276-389)	589 (451-836)	870 (589-1200)	499
Females	13-14	257 (243-272)	244 (225-273)	418 (382-457)	713 (640-785)	895 (756-1100)	421
Nonsmokers†							
Total	13-14	156 (146-167)	136 (124-153)	283 (257-306)	605 (514-714)	1100 (958-1220)	1446
18-49 years	13-14	128 (117-140)	116 (100-129)	225 (182-253)	449 (389-495)	780 (524-1030)	760
50 years and older	13-14	196 (178-216)	181 (152-213)	356 (294-400)	835 (652-1050)	1250 (1020-1720)	686
Gender							
Males	13-14	135 (122-149)	120 (103-138)	238 (202-285)	481 (375-652)	850 (648-1030)	654
Females	13-14	178 (158-199)	153 (131-191)	319 (282-378)	742 (580-958)	1270 (836-1720)	792

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#).

Urinary 1-Methyl-3-amino-5H-pyrido[4,3-b]indole (Trp-P-2) (2013 – 2014)

Geometric mean and selected percentiles of concentrations (in ng/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	1.11 (.780-1.37)	922
18-49 years	13-14	*	< LOD	< LOD	< LOD	1.09 (.820-1.37)	561
50 years and older	13-14	*	< LOD	< LOD	< LOD	1.17 (<LOD-1.79)	361
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	1.17 (<LOD-1.79)	500
Females	13-14	*	< LOD	< LOD	< LOD	1.09 (.640-1.47)	422
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	1446
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	760
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	686
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	655
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	791

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#).
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.63.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 1-Methyl-3-amino-5H-pyrido[4,3-b]indole (Trp-P-2) (creatinine corrected) (2013 – 2014)

Geometric mean and selected percentiles of concentrations (in ng/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	1.96 (1.62-2.54)	921
18-49 years	13-14	*	< LOD	< LOD	< LOD	1.67 (1.41-2.37)	560
50 years and older	13-14	*	< LOD	< LOD	< LOD	2.50 (<LOD-3.55)	361
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	1.61 (<LOD-2.05)	499
Females	13-14	*	< LOD	< LOD	< LOD	2.37 (1.80-3.64)	422
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	1445
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	760
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	685
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	654
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	791

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#).

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary Norharman (2013 – 2014)

Geometric mean and selected percentiles of concentrations (in ng/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	468 (417-525)	475 (403-524)	846 (738-969)	1430 (1210-1740)	1920 (1420-2350)	905
18-49 years	13-14	458 (389-538)	464 (374-540)	838 (664-1000)	1400 (1020-1840)	1980 (1400-2350)	551
50 years and older	13-14	490 (444-542)	482 (401-550)	961 (732-1090)	1520 (1250-1870)	1870 (1420-2470)	354
Gender							
Males	13-14	476 (404-559)	475 (384-528)	838 (617-1080)	1530 (1020-2040)	2000 (1480-2770)	498
Females	13-14	460 (405-521)	464 (382-559)	887 (771-1020)	1400 (1140-1660)	1870 (1400-2280)	407
Nonsmokers†							
Total	13-14	309 (293-326)	304 (283-330)	586 (528-621)	1030 (931-1090)	1460 (1230-1700)	1436
18-49 years	13-14	284 (265-303)	288 (258-310)	528 (467-581)	901 (758-1030)	1240 (1040-1420)	755
50 years and older	13-14	341 (311-374)	330 (303-369)	673 (561-784)	1120 (966-1490)	1720 (1230-2150)	681
Gender							
Males	13-14	357 (326-389)	356 (319-401)	654 (580-777)	1150 (962-1350)	1610 (1230-2090)	648
Females	13-14	274 (256-294)	275 (250-295)	533 (455-592)	901 (777-1040)	1330 (1050-1530)	788

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#).
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 12.6.

Urinary Norharman (creatinine corrected) (2013 – 2014)

Geometric mean and selected percentiles of concentrations (in ng/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	498 (454-546)	505 (448-547)	829 (714-965)	1350 (1150-1590)	1810 (1580-2270)	904
18-49 years	13-14	444 (390-505)	455 (376-519)	736 (602-859)	1150 (905-1490)	1550 (1230-1810)	550
50 years and older	13-14	634 (564-714)	603 (515-732)	1100 (867-1330)	1780 (1440-2120)	2570 (2010-3080)	354
Gender							
Males	13-14	429 (371-498)	429 (388-484)	672 (536-950)	1130 (827-1630)	1550 (1150-2150)	497
Females	13-14	583 (541-629)	597 (535-637)	931 (809-1160)	1590 (1330-1780)	2200 (1700-2590)	407
Nonsmokers†							
Total	13-14	375 (353-398)	359 (338-388)	675 (604-733)	1070 (944-1220)	1420 (1230-1700)	1435
18-49 years	13-14	317 (295-342)	315 (276-347)	526 (462-585)	876 (790-944)	1140 (970-1300)	755
50 years and older	13-14	454 (411-501)	446 (400-522)	836 (724-899)	1250 (1080-1490)	1750 (1370-2280)	680
Gender							
Males	13-14	348 (325-373)	343 (305-375)	606 (529-685)	970 (856-1230)	1330 (996-1740)	647
Females	13-14	399 (368-433)	381 (347-415)	724 (620-803)	1120 (1000-1250)	1580 (1280-1890)	788

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#).

Blood 1,1,1-Trichloroethane (Methyl chloroform) (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	952
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	567
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	385
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	509
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	443
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	2123
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	1110
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	1013
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	941
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	1182

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.01.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/OtherHalogenatedSolvents_BiomonitoringSummary.html

Blood 1,1,1,2-Tetrachloroethane (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	925
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	555
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	370
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	494
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	431
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	2095
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	1098
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	997
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	923
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	1172

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.04.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood 1,2,3-Trichloropropane (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	944
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	560
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	384
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	505
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	439
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	2106
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	1101
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	1005
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	933
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	1173

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.04.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood 1,2-Dibromoethane (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	952
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	567
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	385
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	509
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	443
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	2122
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	1109
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	1013
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	941
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	1181

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.015.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood 1,2-Dichlorobenzene (o-Dichlorobenzene) (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	938
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	555
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	383
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	503
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	435
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	2084
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	1089
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	995
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	923
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	1161

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.025.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Chlorobenzenes_BiomonitoringSummary.html

Blood 1,2-Dichloroethane (Ethylene dichloride) (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	951
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	567
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	384
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	508
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	443
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	2122
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	1110
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	1012
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	941
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	1181

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.01.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/OtherHalogenatedSolvents_BiomonitoringSummary.html

Blood 1,3-Dichlorobenzene (m-Dichlorobenzene) (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	942
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	560
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	382
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	504
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	438
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	2108
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	1101
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	1007
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	932
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	1176

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.025.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Chlorobenzenes_BiomonitoringSummary.html

Blood 1,4-Dichlorobenzene (Paradichlorobenzene) (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	.079 (.055-.117)	.321 (.200-.566)	1.33 (.491-3.80)	939
18-49 years	13-14	*	< LOD	.069 (.050-.099)	.241 (.149-.378)	.954 (.345-2.12)	557
50 years and older	13-14	*	< LOD	.114 (.047-.235)	.541 (.248-1.59)	2.11 (.541-4.10)	382
Gender							
Males	13-14	*	< LOD	.096 (.066-.122)	.402 (.190-.640)	1.64 (.583-4.08)	503
Females	13-14	*	< LOD	.067 (.043-.129)	.297 (.187-.498)	.949 (.378-2.77)	436
Nonsmokers†							
Total	13-14	*	< LOD	.073 (.052-.100)	.311 (.192-.479)	.963 (.512-2.08)	2106
18-49 years	13-14	*	< LOD	.084 (.054-.131)	.337 (.177-.594)	1.19 (.531-3.50)	1099
50 years and older	13-14	*	< LOD	.062 (.046-.081)	.292 (.181-.400)	.761 (.428-1.94)	1007
Gender							
Males	13-14	*	< LOD	.078 (.060-.093)	.331 (.181-.462)	.696 (.462-1.67)	931
Females	13-14	*	< LOD	.070 (.043-.110)	.294 (.176-.591)	1.32 (.591-3.06)	1175

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.04.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Chlorobenzenes_BiomonitoringSummary.html

Blood 1,4-Dioxane (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	922
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	553
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	369
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	493
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	429
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	2069
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	1084
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	985
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	914
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	1155

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.5.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood 2,5-Dimethylfuran (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	.073 (.063-.084)	.089 (.077-.103)	.157 (.142-.174)	.234 (.204-.261)	.294 (.248-.325)	951
18-49 years	13-14	.065 (.054-.078)	.083 (.067-.098)	.154 (.130-.176)	.241 (.207-.262)	.295 (.248-.325)	567
50 years and older	13-14	.091 (.077-.106)	.105 (.088-.116)	.161 (.150-.178)	.222 (.192-.277)	.279 (.222-.338)	384
Gender							
Males	13-14	.067 (.057-.078)	.082 (.070-.098)	.161 (.132-.180)	.257 (.206-.295)	.310 (.272-.346)	509
Females	13-14	.080 (.066-.097)	.095 (.079-.111)	.155 (.134-.178)	.215 (.195-.244)	.253 (.225-.295)	442
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	2122
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	1110
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	1012
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	940
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	1182

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.011.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/2,5-Dimethylfuran_BiomonitoringSummary.html

Blood Benzene (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	.139 (.121-.159)	.167 (.145-.188)	.279 (.243-.311)	.413 (.371-.436)	.500 (.439-.558)	915
18-49 years	13-14	.125 (.105-.149)	.155 (.121-.176)	.263 (.229-.311)	.414 (.367-.439)	.498 (.427-.558)	542
50 years and older	13-14	.168 (.144-.196)	.195 (.167-.219)	.304 (.249-.327)	.388 (.362-.443)	.525 (.427-.633)	373
Gender							
Males	13-14	.132 (.113-.153)	.158 (.127-.182)	.281 (.233-.339)	.436 (.403-.498)	.549 (.458-.650)	493
Females	13-14	.146 (.122-.174)	.170 (.149-.208)	.275 (.234-.315)	.368 (.327-.430)	.444 (.388-.498)	422
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	.029 (<LOD-.051)	.081 (.036-.144)	2049
18-49 years	13-14	*	< LOD	< LOD	.033 (<LOD-.061)	.090 (.037-.148)	1077
50 years and older	13-14	*	< LOD	< LOD	.027 (<LOD-.050)	.075 (.029-.125)	972
Gender							
Males	13-14	*	< LOD	< LOD	.032 (<LOD-.073)	.108 (.036-.148)	910
Females	13-14	*	< LOD	< LOD	.027 (<LOD-.052)	.060 (.036-.107)	1139

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.024.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Benzene_BiomonitoringSummary.html

Blood Bromodichloromethane (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	.008 (<LOD-.010)	.011 (.008-.015)	932
18-49 years	13-14	*	< LOD	< LOD	.008 (<LOD-.010)	.011 (.008-.013)	554
50 years and older	13-14	*	< LOD	< LOD	.007 (<LOD-.010)	.012 (.007-.018)	378
Gender							
Males	13-14	*	< LOD	< LOD	.008 (<LOD-.011)	.011 (.007-.018)	497
Females	13-14	*	< LOD	< LOD	.007 (<LOD-.009)	.010 (.008-.012)	435
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	.007 (<LOD-.008)	.009 (.007-.012)	2093
18-49 years	13-14	*	< LOD	< LOD	.007 (<LOD-.008)	.010 (.008-.012)	1095
50 years and older	13-14	*	< LOD	< LOD	.006 (<LOD-.008)	.009 (.007-.012)	998
Gender							
Males	13-14	*	< LOD	< LOD	.007 (<LOD-.009)	.010 (.009-.012)	927
Females	13-14	*	< LOD	< LOD	.006 (<LOD-.008)	.009 (.007-.011)	1166

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.006.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Chlorobenzene (Monochlorobenzene) (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	952
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	567
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	385
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	509
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	443
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	2122
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	1109
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	1013
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	940
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	1182

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.011.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Chlorobenzenes_BiomonitoringSummary.html

Blood Chloroethane (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	949
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	565
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	384
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	508
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	441
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	2119
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	1110
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	1009
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	937
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	1182

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.045.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Cyclohexane (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	899
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	533
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	366
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	475
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	424
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	1991
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	1036
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	955
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	891
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	1100

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.02.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Dibromochloromethane (Chlorodibromomethane) (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	.007 (<LOD-.011)	948
18-49 years	13-14	*	< LOD	< LOD	< LOD	.007 (<LOD-.010)	565
50 years and older	13-14	*	< LOD	< LOD	.005 (<LOD-.009)	.010 (.005-.013)	383
Gender							
Males	13-14	*	< LOD	< LOD	.005 (<LOD-.007)	.008 (.006-.013)	505
Females	13-14	*	< LOD	< LOD	< LOD	.007 (<LOD-.010)	443
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	.007 (.006-.008)	2118
18-49 years	13-14	*	< LOD	< LOD	.005 (<LOD-.007)	.008 (.006-.012)	1109
50 years and older	13-14	*	< LOD	< LOD	< LOD	.006 (<LOD-.007)	1009
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	.007 (.006-.009)	941
Females	13-14	*	< LOD	< LOD	< LOD	.007 (.005-.009)	1177

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.005.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Dichloromethane (Methylene chloride) (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	928
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	555
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	373
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	498
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	430
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	2085
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	1088
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	997
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	924
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	1161

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.25.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/HalogenatedSolvents_BiomonitoringSummary.html

Blood Diethyl Ether (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	901
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	535
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	366
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	481
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	420
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	2017
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	1060
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	957
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	897
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	1120

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.04.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Ethyl acetate (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	939
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	559
50 years and older	13-14	*	< LOD	< LOD	< LOD	.541 (<LOD-4.08)	380
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	503
Females	13-14	*	< LOD	< LOD	< LOD	.224 (<LOD-6.39)	436
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	2080
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	1088
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	992
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	919
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	1161

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.158.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Ethylbenzene (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	.062 (.056-.068)	.063 (.059-.070)	.104 (.094-.115)	.150 (.137-.165)	.189 (.165-.199)	921
18-49 years	13-14	.059 (.052-.066)	.060 (.055-.068)	.104 (.092-.119)	.151 (.136-.173)	.189 (.164-.209)	546
50 years and older	13-14	.067 (.060-.075)	.070 (.062-.080)	.103 (.090-.115)	.147 (.132-.152)	.192 (.151-.197)	375
Gender							
Males	13-14	.062 (.055-.069)	.062 (.055-.072)	.113 (.097-.132)	.170 (.146-.194)	.199 (.189-.217)	490
Females	13-14	.061 (.054-.069)	.064 (.060-.073)	.094 (.084-.108)	.136 (.124-.149)	.156 (.147-.169)	431
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	.035 (.025-.047)	.054 (.043-.075)	2031
18-49 years	13-14	*	< LOD	< LOD	.031 (<LOD-.040)	.050 (.037-.079)	1058
50 years and older	13-14	*	< LOD	< LOD	.040 (<LOD-.059)	.059 (.045-.082)	973
Gender							
Males	13-14	*	< LOD	< LOD	.039 (.031-.048)	.057 (.048-.076)	901
Females	13-14	*	< LOD	< LOD	.031 (<LOD-.047)	.052 (.035-.077)	1130

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.024.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Ethylbenzene_BiomonitoringSummary.html

Blood Furan (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	.051 (.046-.056)	.055 (.046-.063)	.092 (.082-.104)	.139 (.126-.152)	.172 (.146-.205)	951
18-49 years	13-14	.047 (.041-.054)	.048 (.037-.061)	.087 (.075-.103)	.142 (.133-.155)	.176 (.148-.202)	566
50 years and older	13-14	.058 (.051-.065)	.061 (.053-.072)	.103 (.089-.112)	.136 (.118-.165)	.170 (.131-.226)	385
Gender							
Males	13-14	.048 (.043-.055)	.050 (.038-.061)	.090 (.077-.107)	.162 (.122-.182)	.194 (.162-.215)	508
Females	13-14	.053 (.046-.062)	.056 (.048-.066)	.094 (.075-.115)	.125 (.116-.141)	.148 (.138-.156)	443
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	2123
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	1110
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	1013
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	941
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	1182

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.025.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Heptane (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	923
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	549
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	374
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	492
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	431
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	2053
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	1071
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	982
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	911
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	1142

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Hexane (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	881
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	520
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	361
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	470
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	411
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	1939
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	1003
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	936
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	866
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	1073

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.122.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Isopropylbenzene (Cumene) (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	952
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	567
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	385
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	509
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	443
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	2123
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	1110
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	1013
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	941
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	1182

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.04.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Methyl-tert-Butyl Ether (MTBE) (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	900
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	538
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	362
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	490
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	410
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	2020
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	1050
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	970
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	892
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	1128

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.01.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/MTBE_BiomonitoringSummary.html

Blood Methylcyclopentane (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	935
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	557
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	378
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	497
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	438
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	2087
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	1089
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	998
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	932
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	1155

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.02.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Nitrobenzene (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	939
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	563
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	376
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	503
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	436
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	2113
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	1108
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	1005
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	934
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	1179

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.32.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Nitrobenzene_BiomonitoringSummary.html

Blood Octane (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	938
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	556
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	382
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	500
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	438
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	2059
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	1081
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	978
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	914
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	1145

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Tetrachloroethene (Perchloroethylene) (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	.070 (<LOD-.943)	884
18-49 years	13-14	*	< LOD	< LOD	< LOD	.048 (<LOD-.096)	525
50 years and older	13-14	*	< LOD	< LOD	.061 (<LOD-1.56)	1.20 (<LOD-5.11)	359
Gender							
Males	13-14	*	< LOD	< LOD	.049 (<LOD-.070)	.102 (.049-.979)	472
Females	13-14	*	< LOD	< LOD	< LOD	.049 (<LOD-1.56)	412
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	.083 (.067-.104)	1972
18-49 years	13-14	*	< LOD	< LOD	< LOD	.074 (.050-.111)	1023
50 years and older	13-14	*	< LOD	< LOD	.051 (<LOD-.078)	.086 (.066-.146)	949
Gender							
Males	13-14	*	< LOD	< LOD	.050 (<LOD-.063)	.099 (.066-.162)	877
Females	13-14	*	< LOD	< LOD	< LOD	.078 (.051-.103)	1095

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.048.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/HalogenatedSolvents_BiomonitoringSummary.html

Blood Tetrachloromethane (Carbon tetrachloride) (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	952
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	567
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	385
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	509
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	443
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	2119
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	1108
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	1011
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	939
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	1180

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.005.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/OtherHalogenatedSolvents_BiomonitoringSummary.html

Blood Tetrahydrofuran (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	912
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	543
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	369
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	486
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	426
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	2033
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	1060
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	973
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	902
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	1131

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.125.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Toluene (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	.383 (.343-.428)	.422 (.363-.498)	.685 (.619-.734)	1.01 (.913-1.09)	1.19 (1.10-1.31)	913
18-49 years	13-14	.355 (.310-.405)	.388 (.322-.471)	.670 (.567-.797)	1.01 (.875-1.09)	1.19 (1.09-1.31)	543
50 years and older	13-14	.442 (.389-.501)	.499 (.408-.542)	.701 (.631-.743)	1.02 (.913-1.12)	1.17 (1.08-1.31)	370
Gender							
Males	13-14	.376 (.337-.418)	.400 (.364-.460)	.729 (.650-.826)	1.10 (1.01-1.20)	1.31 (1.19-1.60)	494
Females	13-14	.390 (.333-.457)	.446 (.340-.541)	.646 (.581-.718)	.902 (.807-.996)	1.05 (.953-1.14)	419
Nonsmokers†							
Total	13-14	.064 (.059-.070)	.058 (.055-.062)	.086 (.078-.095)	.147 (.127-.188)	.241 (.201-.338)	2058
18-49 years	13-14	.064 (.059-.070)	.057 (.054-.061)	.085 (.079-.094)	.147 (.126-.197)	.243 (.207-.388)	1072
50 years and older	13-14	.064 (.058-.072)	.059 (.054-.065)	.088 (.077-.100)	.147 (.123-.191)	.230 (.188-.307)	986
Gender							
Males	13-14	.069 (.063-.074)	.061 (.057-.065)	.092 (.085-.100)	.173 (.139-.213)	.244 (.215-.346)	911
Females	13-14	.061 (.054-.068)	.056 (.051-.060)	.082 (.072-.094)	.135 (.109-.174)	.225 (.147-.395)	1147

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.025.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Toluene_BiomonitoringSummary.html

Blood Tribromomethane (Bromoform) (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	939
18-49 years	13-14	*	< LOD	< LOD	< LOD	.009 (<LOD-.011)	557
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	382
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	.009 (<LOD-.011)	504
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	435
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	.008 (<LOD-.010)	2094
18-49 years	13-14	*	< LOD	< LOD	< LOD	.009 (<LOD-.012)	1093
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	1001
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	927
Females	13-14	*	< LOD	< LOD	< LOD	.009 (<LOD-.011)	1167

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.008.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Trichloroethene (Trichloroethylene) (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	923
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	551
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	372
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	492
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	431
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	2054
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	1076
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	978
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	910
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	1144

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.012.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/HalogenatedSolvents_BiomonitoringSummary.html

Blood Trichloromethane (Chloroform) (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	.009 (<LOD-.012)	.018 (.015-.024)	.032 (.027-.039)	.051 (.038-.062)	926
18-49 years	13-14	*	.009 (<LOD-.012)	.017 (.014-.022)	.030 (.025-.036)	.049 (.033-.062)	550
50 years and older	13-14	*	.009 (<LOD-.015)	.020 (.015-.027)	.035 (.025-.051)	.052 (.037-.077)	376
Gender							
Males	13-14	*	< LOD	.016 (.013-.022)	.030 (.024-.038)	.053 (.036-.062)	493
Females	13-14	.012 (.010-.015)	.011 (<LOD-.015)	.021 (.014-.027)	.034 (.025-.044)	.045 (.032-.084)	433
Nonsmokers†							
Total	13-14	*	.008 (<LOD-.010)	.016 (.014-.019)	.026 (.023-.034)	.040 (.032-.048)	2080
18-49 years	13-14	*	< LOD	.015 (.013-.017)	.026 (.022-.032)	.040 (.030-.051)	1087
50 years and older	13-14	*	.009 (<LOD-.011)	.017 (.015-.019)	.027 (.023-.036)	.040 (.034-.043)	993
Gender							
Males	13-14	*	< LOD	.016 (.014-.019)	.026 (.022-.036)	.038 (.028-.050)	924
Females	13-14	*	.008 (<LOD-.010)	.016 (.014-.018)	.027 (.023-.034)	.041 (.033-.050)	1156

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.008.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood $\alpha\alpha$ -Trifluorotoluene (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	952
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	567
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	385
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	509
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	443
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	2123
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	1110
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	1013
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	941
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	1182

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.04.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Vinyl Bromide (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	941
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	559
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	382
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	505
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	436
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	< LOD	< LOD	2088
18-49 years	13-14	*	< LOD	< LOD	< LOD	< LOD	1093
50 years and older	13-14	*	< LOD	< LOD	< LOD	< LOD	995
Gender							
Males	13-14	*	< LOD	< LOD	< LOD	< LOD	923
Females	13-14	*	< LOD	< LOD	< LOD	< LOD	1165

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.045.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood m-/p-Xylene (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	.157 (.142-.173)	.165 (.148-.181)	.258 (.239-.280)	.361 (.340-.386)	.460 (.410-.501)	946
18-49 years	13-14	.150 (.134-.169)	.158 (.138-.175)	.258 (.225-.288)	.368 (.332-.395)	.476 (.401-.516)	562
50 years and older	13-14	.169 (.150-.191)	.177 (.156-.199)	.257 (.235-.280)	.359 (.310-.410)	.447 (.385-.518)	384
Gender							
Males	13-14	.163 (.146-.182)	.165 (.148-.186)	.288 (.255-.308)	.410 (.368-.472)	.516 (.443-.569)	506
Females	13-14	.151 (.134-.171)	.165 (.145-.182)	.239 (.208-.260)	.325 (.286-.340)	.382 (.340-.439)	440
Nonsmokers†							
Total	13-14	*	.041 (.035-.047)	.065 (.057-.077)	.124 (.089-.163)	.187 (.154-.248)	2098
18-49 years	13-14	*	.040 (<LOD-.045)	.063 (.055-.070)	.102 (.085-.147)	.166 (.136-.248)	1099
50 years and older	13-14	.050 (.043-.059)	.043 (.036-.051)	.070 (.057-.090)	.144 (.091-.187)	.198 (.158-.286)	999
Gender							
Males	13-14	.050 (.045-.056)	.045 (.039-.050)	.070 (.063-.084)	.149 (.101-.169)	.203 (.168-.250)	930
Females	13-14	*	.039 (<LOD-.046)	.062 (.051-.075)	.105 (.077-.160)	.164 (.111-.302)	1168

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.034.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Xylenes_BiomonitoringSummary.html

Blood o-Xylene (2013 – 2014)

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	13-14	.035 (.033-.038)	.036 (.032-.039)	.053 (.049-.058)	.075 (.067-.082)	.091 (.082-.107)	952
18-49 years	13-14	.034 (.032-.037)	.034 (.029-.039)	.053 (.047-.058)	.077 (.066-.084)	.091 (.082-.107)	567
50 years and older	13-14	.038 (.033-.042)	.037 (.032-.043)	.053 (.049-.058)	.071 (.066-.085)	.089 (.071-.114)	385
Gender							
Males	13-14	.037 (.034-.040)	.036 (.033-.041)	.058 (.053-.065)	.082 (.073-.094)	.102 (.083-.170)	509
Females	13-14	.034 (.030-.038)	.035 (.030-.039)	.049 (.043-.055)	.065 (.059-.070)	.078 (.068-.091)	443
Nonsmokers†							
Total	13-14	*	< LOD	< LOD	.034 (.027-.049)	.051 (.042-.073)	2123
18-49 years	13-14	*	< LOD	< LOD	.030 (.026-.039)	.048 (.035-.070)	1110
50 years and older	13-14	*	< LOD	< LOD	.039 (.029-.051)	.057 (.046-.085)	1013
Gender							
Males	13-14	*	< LOD	< LOD	.038 (.030-.050)	.059 (.046-.075)	941
Females	13-14	*	< LOD	< LOD	.032 (<LOD-.048)	.048 (.035-.075)	1182

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.024.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Xylenes_BiomonitoringSummary.html

Urinary N-Acetyl-S-(2-carboxyethyl)-L-cysteine (2011 – 2012)

Metabolite of Acrolein

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	206 (182-232)	224 (190-250)	398 (358-452)	722 (593-894)	1000 (821-1240)	869
Age group							
20-49 years	11-12	184 (158-214)	200 (171-235)	356 (304-406)	634 (563-697)	842 (692-1070)	518
50 years and older	11-12	245 (201-298)	251 (190-344)	501 (395-579)	911 (542-1240)	1230 (894-1710)	351
Gender							
Males	11-12	218 (182-261)	236 (191-267)	427 (372-507)	827 (589-1060)	1230 (894-1410)	525
Females	11-12	191 (166-220)	198 (162-260)	372 (307-453)	657 (514-818)	874 (692-1060)	344
Nonsmokers†							
Total	11-12	73.0 (67.3-79.3)	78.6 (72.5-86.4)	144 (133-157)	241 (216-279)	338 (291-414)	1318
Age group							
20-49 years	11-12	66.5 (58.8-75.3)	74.2 (65.7-84.1)	135 (117-147)	235 (205-260)	305 (253-351)	659
50 years and older	11-12	80.8 (73.1-89.3)	85.4 (73.9-97.7)	158 (135-175)	278 (216-333)	424 (292-489)	659
Gender							
Males	11-12	98.1 (89.3-108)	98.6 (87.1-116)	174 (151-198)	298 (259-338)	414 (322-457)	628
Females	11-12	57.9 (51.4-65.1)	60.5 (48.9-73.9)	122 (106-140)	203 (175-230)	267 (230-314)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 6.96.

Urinary N-Acetyl-S-(2-carboxyethyl)-L-cysteine (creatinine corrected) (2011 – 2012)

Metabolite of Acrolein

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	227 (209-247)	236 (208-265)	381 (343-416)	575 (476-698)	785 (623-906)	869
Age group							
20-49 years	11-12	192 (175-211)	188 (169-206)	332 (297-367)	459 (412-527)	627 (488-845)	518
50 years and older	11-12	296 (253-347)	305 (242-353)	475 (373-551)	698 (515-906)	906 (553-1380)	351
Gender							
Males	11-12	207 (182-235)	207 (185-234)	341 (296-390)	488 (409-592)	614 (513-785)	525
Females	11-12	257 (224-294)	270 (231-321)	429 (396-491)	695 (491-871)	871 (692-979)	344
Nonsmokers†							
Total	11-12	85.6 (79.9-91.8)	83.5 (77.6-92.1)	132 (122-142)	192 (174-227)	257 (232-285)	1317
Age group							
20-49 years	11-12	73.0 (67.3-79.1)	71.6 (68.0-77.9)	111 (97.1-128)	165 (145-177)	188 (175-214)	658
50 years and older	11-12	102 (92.8-111)	96.9 (92.2-104)	153 (137-172)	251 (205-284)	322 (277-373)	659
Gender							
Males	11-12	87.5 (80.8-94.8)	82.4 (73.5-95.8)	128 (115-140)	201 (168-255)	277 (203-326)	627
Females	11-12	84.2 (77.1-91.9)	87.3 (75.9-94.5)	133 (120-147)	190 (174-219)	248 (212-291)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Urinary N-Acetyl-S-(3-hydroxypropyl)-L-cysteine (2011 – 2012)

Metabolite of Acrolein

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	821 (727-927)	831 (720-1030)	1760 (1520-2070)	2920 (2640-3180)	3760 (3370-4290)	869
Age group							
20-49 years	11-12	764 (637-915)	809 (606-986)	1620 (1330-2070)	2710 (2350-3020)	3480 (3020-3750)	518
50 years and older	11-12	919 (776-1090)	1020 (771-1290)	2050 (1660-2400)	3560 (2840-4240)	4290 (3560-4600)	351
Gender							
Males	11-12	866 (718-1040)	868 (708-1160)	1910 (1580-2350)	3020 (2670-3190)	4290 (3020-4600)	525
Females	11-12	767 (696-846)	801 (699-942)	1580 (1320-2010)	2710 (2180-3560)	3560 (2710-4240)	344
Nonsmokers†							
Total	11-12	171 (159-184)	174 (161-190)	313 (293-335)	534 (466-651)	779 (687-920)	1318
Age group							
20-49 years	11-12	183 (162-206)	190 (163-220)	328 (298-366)	558 (438-671)	771 (616-1050)	659
50 years and older	11-12	160 (142-180)	161 (140-175)	291 (238-355)	529 (395-702)	794 (640-971)	659
Gender							
Males	11-12	220 (203-238)	224 (210-238)	349 (301-375)	634 (528-682)	823 (671-949)	628
Females	11-12	141 (126-157)	140 (118-155)	283 (244-313)	495 (395-651)	771 (515-1120)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 13.0.

Urinary N-Acetyl-S-(3-hydroxypropyl)-L-cysteine (creatinine corrected) (2011 – 2012)

Metabolite of Acrolein

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	907 (833-987)	930 (817-1090)	1780 (1590-1990)	2830 (2290-3290)	3690 (2940-4720)	869
Age group							
20-49 years	11-12	796 (699-906)	815 (663-955)	1420 (1290-1710)	2440 (2100-3120)	3560 (2810-4280)	518
50 years and older	11-12	1110 (987-1250)	1260 (1080-1460)	2210 (1920-2290)	3050 (2290-3900)	3900 (2830-5520)	351
Gender							
Males	11-12	820 (736-914)	801 (707-952)	1420 (1260-1670)	2290 (1950-2870)	3370 (2310-4000)	525
Females	11-12	1030 (853-1240)	1170 (1020-1330)	2250 (1810-2500)	3110 (2500-4110)	4250 (2930-5740)	344
Nonsmokers†							
Total	11-12	201 (189-214)	184 (171-197)	298 (283-316)	510 (446-564)	692 (576-812)	1317
Age group							
20-49 years	11-12	201 (183-220)	180 (163-197)	298 (269-342)	519 (424-626)	678 (546-863)	658
50 years and older	11-12	201 (179-226)	190 (171-211)	298 (246-350)	499 (399-606)	710 (550-902)	659
Gender							
Males	11-12	197 (184-210)	186 (169-199)	287 (245-318)	451 (392-527)	606 (529-675)	627
Females	11-12	205 (188-222)	183 (164-211)	315 (284-355)	544 (457-647)	778 (622-902)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Urinary N-Acetyl-S-(2-carbamoylethyl)-L-cysteine (2011 – 2012)

Metabolite of Acrylamide

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	110 (92.8-130)	113 (84.6-144)	219 (194-256)	384 (291-507)	507 (358-679)	869
Age group							
20-49 years	11-12	118 (93.4-149)	129 (99.8-158)	254 (195-305)	420 (316-540)	540 (401-752)	518
50 years and older	11-12	97.9 (79.7-120)	84.7 (75.3-138)	201 (138-251)	292 (243-370)	407 (324-528)	351
Gender							
Males	11-12	122 (96.1-154)	131 (99.7-164)	256 (212-292)	445 (333-540)	540 (422-752)	525
Females	11-12	96.2 (84.8-109)	90.0 (79.5-122)	194 (153-226)	304 (254-378)	401 (313-445)	344
Nonsmokers†							
Total	11-12	36.5 (34.0-39.3)	37.3 (34.7-40.6)	64.8 (61.4-68.9)	112 (100-125)	162 (141-188)	1318
Age group							
20-49 years	11-12	38.9 (34.1-44.4)	41.2 (34.7-47.0)	73.0 (63.8-78.5)	131 (106-163)	193 (152-285)	659
50 years and older	11-12	34.1 (31.6-36.8)	35.3 (32.5-38.8)	59.7 (54.8-64.3)	94.0 (79.3-117)	129 (104-145)	659
Gender							
Males	11-12	45.8 (42.8-49.0)	47.6 (40.4-53.0)	76.9 (72.3-82.2)	129 (112-142)	162 (142-189)	628
Females	11-12	30.6 (27.2-34.3)	30.7 (29.2-33.4)	55.5 (49.1-59.9)	100 (84.0-117)	164 (108-285)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 2.2.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Acrylamide_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Acrylamide_FactSheet.html

Urinary N-Acetyl-S-(2-carbamoylethyl)-L-cysteine (creatinine corrected) (2011 – 2012)

Metabolite of Acrylamide

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	121 (107-137)	129 (115-142)	180 (161-199)	248 (214-325)	343 (248-432)	869
Age group							
20-49 years	11-12	123 (105-144)	131 (116-148)	186 (153-230)	280 (221-364)	367 (278-434)	518
50 years and older	11-12	118 (102-137)	124 (98.6-149)	175 (146-200)	235 (176-282)	272 (235-353)	351
Gender							
Males	11-12	115 (99.3-134)	121 (100-142)	176 (154-188)	233 (191-353)	353 (230-432)	525
Females	11-12	129 (110-152)	135 (117-161)	188 (161-235)	270 (230-337)	340 (259-391)	344
Nonsmokers†							
Total	11-12	42.8 (40.5-45.4)	42.1 (39.2-45.3)	61.6 (58.9-63.8)	90.0 (79.5-104)	118 (105-134)	1317
Age group							
20-49 years	11-12	42.8 (39.1-46.8)	41.3 (36.9-44.8)	61.2 (56.7-64.7)	93.8 (76.8-113)	128 (103-159)	658
50 years and older	11-12	42.9 (39.5-46.6)	43.5 (38.9-48.5)	62.3 (56.7-66.2)	88.1 (72.9-105)	113 (90.4-155)	659
Gender							
Males	11-12	40.9 (38.5-43.5)	39.5 (35.7-43.4)	61.2 (55.3-66.0)	82.5 (76.7-90.9)	109 (100-122)	627
Females	11-12	44.4 (41.0-48.2)	44.8 (40.0-47.7)	62.3 (57.7-65.4)	96.8 (79.2-117)	131 (98.1-175)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Acrylamide_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Acrylamide_FactSheet.html

Urinary N-Acetyl-S-(2-carbamoyl-2-hydroxyethyl)-L-cysteine (2011 – 2012)

Metabolite of Acrylamide

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	17.2 (15.2-19.4)	15.8 (13.6-19.7)	30.3 (26.2-35.3)	53.0 (39.0-69.3)	76.2 (53.3-82.0)	869
Age group							
20-49 years	11-12	18.1 (15.5-21.2)	18.0 (13.6-21.9)	31.4 (25.2-40.3)	57.1 (43.0-73.9)	77.4 (55.3-94.7)	518
50 years and older	11-12	15.8 (13.0-19.2)	14.7 (10.6-18.9)	27.1 (19.9-37.1)	46.6 (34.7-68.7)	74.5 (40.0-88.9)	351
Gender							
Males	11-12	18.0 (15.0-21.6)	17.1 (13.3-22.4)	33.0 (25.2-40.3)	53.0 (38.8-73.9)	77.4 (53.0-94.7)	525
Females	11-12	16.2 (14.3-18.4)	14.1 (13.1-17.0)	28.3 (23.6-31.9)	51.7 (31.8-76.2)	74.5 (39.6-97.6)	344
Nonsmokers†							
Total	11-12	*	< LOD	11.6 (10.8-12.2)	17.9 (16.2-20.4)	25.0 (20.7-30.3)	1318
Age group							
20-49 years	11-12	*	< LOD	12.4 (11.1-14.4)	19.9 (16.2-26.9)	29.3 (20.8-42.0)	659
50 years and older	11-12	*	< LOD	10.8 (9.65-11.9)	16.8 (13.4-19.0)	20.7 (16.3-29.1)	659
Gender							
Males	11-12	*	< LOD	12.5 (11.7-13.8)	18.4 (16.2-21.3)	22.9 (19.0-30.3)	628
Females	11-12	*	< LOD	10.6 (9.53-11.6)	16.7 (14.3-20.7)	26.9 (18.8-33.7)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 9.4.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Acrylamide_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Acrylamide_FactSheet.html

Urinary N-Acetyl-S-(2-carbamoyl-2-hydroxyethyl)-L-cysteine (creatinine corrected) (2011 – 2012)

Metabolite of Acrylamide

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	19.0 (17.1-21.1)	19.1 (16.6-22.2)	28.0 (25.1-32.9)	39.1 (35.6-42.0)	45.2 (42.0-48.2)	869
Age group							
20-49 years	11-12	18.9 (17.0-21.0)	19.3 (17.1-21.0)	28.4 (24.8-33.3)	41.0 (35.8-44.3)	48.2 (41.0-55.4)	518
50 years and older	11-12	19.1 (16.3-22.3)	18.5 (15.4-23.4)	27.7 (23.2-33.9)	38.1 (28.8-42.0)	42.0 (33.5-54.2)	351
Gender							
Males	11-12	17.0 (15.0-19.4)	16.6 (15.2-18.9)	25.2 (21.0-28.4)	35.9 (30.5-39.1)	43.0 (39.1-47.1)	525
Females	11-12	21.8 (19.2-24.8)	22.8 (19.8-25.7)	33.2 (26.6-38.7)	42.0 (35.0-49.4)	47.5 (42.0-56.4)	344
Nonsmokers†							
Total	11-12	*	< LOD	15.9 (14.5-16.6)	24.6 (22.2-26.6)	31.7 (26.6-41.6)	1317
Age group							
20-49 years	11-12	*	< LOD	16.1 (14.1-18.0)	26.6 (20.2-36.9)	39.1 (28.9-51.2)	658
50 years and older	11-12	*	< LOD	15.8 (13.7-17.1)	23.8 (20.2-24.6)	27.7 (24.6-30.2)	659
Gender							
Males	11-12	*	< LOD	11.9 (10.9-12.8)	17.1 (15.1-19.8)	22.9 (19.0-26.6)	627
Females	11-12	*	< LOD	18.5 (16.9-20.2)	27.7 (24.6-36.9)	41.6 (28.9-51.2)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Acrylamide_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Acrylamide_FactSheet.html

Urinary N-Acetyl-S-(2-cyanoethyl)-L-cysteine (2011 – 2012)

Metabolite of Acrylonitrile

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	115 (95.2-140)	141 (118-172)	274 (233-310)	480 (439-542)	705 (519-792)	869
Age group							
20-49 years	11-12	108 (81.9-143)	139 (105-190)	261 (220-290)	484 (371-590)	708 (505-888)	518
50 years and older	11-12	127 (100-162)	146 (117-186)	305 (218-350)	468 (384-652)	705 (443-846)	351
Gender							
Males	11-12	124 (93.8-165)	166 (131-192)	306 (250-376)	551 (467-646)	745 (542-846)	525
Females	11-12	105 (87.2-126)	127 (114-144)	233 (197-277)	360 (290-471)	504 (402-699)	344
Nonsmokers†							
Total	11-12	1.55 (1.40-1.71)	1.34 (1.22-1.47)	2.36 (2.20-2.51)	4.82 (3.70-6.84)	16.6 (8.95-23.7)	1318
Age group							
20-49 years	11-12	1.74 (1.45-2.08)	1.46 (1.24-1.67)	2.52 (2.28-2.97)	7.59 (4.81-13.3)	20.3 (8.55-79.9)	659
50 years and older	11-12	1.37 (1.21-1.54)	1.23 (1.07-1.36)	2.20 (1.88-2.44)	3.65 (3.08-4.36)	6.84 (3.80-19.9)	659
Gender							
Males	11-12	1.90 (1.62-2.23)	1.62 (1.44-1.85)	2.96 (2.44-3.24)	5.97 (3.73-15.4)	19.9 (8.83-25.5)	628
Females	11-12	1.31 (1.11-1.56)	1.20 (1.03-1.29)	1.94 (1.78-2.16)	3.85 (3.01-5.31)	10.8 (4.82-56.0)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.5.

Urinary N-Acetyl-S-(2-cyanoethyl)-L-cysteine (creatinine corrected) (2011 – 2012)

Metabolite of Acrylonitrile

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	127 (109-148)	166 (148-181)	261 (237-292)	409 (346-457)	537 (442-622)	869
Age group							
20-49 years	11-12	113 (91.4-139)	146 (127-163)	236 (220-274)	396 (309-442)	550 (408-657)	518
50 years and older	11-12	154 (126-188)	195 (167-229)	300 (249-342)	442 (356-484)	537 (458-622)	351
Gender							
Males	11-12	118 (97.2-143)	147 (125-167)	233 (215-261)	359 (323-435)	462 (408-622)	525
Females	11-12	141 (109-182)	200 (162-229)	295 (255-342)	448 (330-565)	565 (442-657)	344
Nonsmokers†							
Total	11-12	1.82 (1.65-1.99)	1.49 (1.36-1.62)	2.34 (2.04-2.64)	4.79 (3.89-6.06)	13.5 (8.27-20.6)	1317
Age group							
20-49 years	11-12	1.91 (1.65-2.22)	1.53 (1.31-1.71)	2.51 (2.18-2.77)	6.53 (4.43-10.0)	23.6 (7.54-67.8)	658
50 years and older	11-12	1.72 (1.55-1.91)	1.48 (1.32-1.62)	2.19 (1.88-2.64)	3.82 (2.95-5.46)	7.95 (4.24-22.4)	659
Gender							
Males	11-12	1.70 (1.49-1.94)	1.36 (1.21-1.54)	2.03 (1.76-2.57)	5.46 (3.12-10.0)	13.7 (7.56-40.4)	627
Females	11-12	1.91 (1.65-2.21)	1.57 (1.47-1.73)	2.57 (2.19-2.90)	4.60 (3.43-6.17)	11.8 (5.29-45.4)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Urinary N-Acetyl-S-(2-hydroxyethyl)-L-cysteine (2011 – 2012)

Metabolite of Acrylonitrile, Ethylene oxide, and Vinyl chloride

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	2.51 (2.21-2.85)	2.50 (2.02-2.89)	5.28 (4.30-6.46)	10.5 (7.92-14.8)	16.9 (12.5-20.9)	869
Age group							
20-49 years	11-12	2.66 (2.31-3.06)	2.75 (2.30-3.10)	5.26 (4.28-6.54)	10.5 (7.63-15.8)	16.9 (12.5-18.9)	518
50 years and older	11-12	2.30 (1.77-2.99)	2.02 (1.35-2.98)	5.28 (3.14-7.60)	11.2 (6.50-22.7)	18.2 (8.11-37.5)	351
Gender							
Males	11-12	2.25 (1.84-2.74)	1.99 (1.53-2.61)	4.51 (3.22-6.15)	11.9 (6.92-16.9)	16.9 (10.6-23.1)	525
Females	11-12	2.89 (2.53-3.30)	3.10 (2.65-3.64)	6.04 (4.76-6.83)	10.1 (7.93-13.3)	15.2 (10.5-20.5)	344
Nonsmokers†							
Total	11-12	*	< LOD	1.27 (1.14-1.43)	2.12 (1.85-2.44)	2.98 (2.57-3.70)	1318
Age group							
20-49 years	11-12	*	< LOD	1.38 (1.18-1.58)	2.46 (1.99-2.83)	3.76 (2.69-5.01)	659
50 years and older	11-12	*	< LOD	1.17 (.904-1.45)	1.79 (1.53-2.26)	2.41 (2.09-3.34)	659
Gender							
Males	11-12	*	< LOD	1.19 (.994-1.51)	2.02 (1.77-2.32)	2.50 (2.26-3.64)	628
Females	11-12	*	< LOD	1.31 (1.15-1.43)	2.17 (1.63-2.88)	3.34 (2.53-4.80)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.791.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary N-Acetyl-S-(2-hydroxyethyl)-L-cysteine (creatinine corrected) (2011 – 2012)

Metabolite of Acrylonitrile, Ethylene oxide, and Vinyl chloride

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	2.77 (2.44-3.15)	2.88 (2.24-3.39)	5.57 (4.40-7.16)	10.5 (8.12-11.7)	15.5 (10.7-18.4)	869
Age group							
20-49 years	11-12	2.77 (2.53-3.03)	2.96 (2.12-3.73)	5.56 (4.99-6.25)	9.42 (8.12-10.8)	12.5 (10.5-20.9)	518
50 years and older	11-12	2.78 (2.12-3.63)	2.72 (2.06-3.37)	5.80 (3.38-10.2)	11.0 (6.72-17.6)	15.9 (7.73-20.7)	351
Gender							
Males	11-12	2.13 (1.84-2.46)	2.02 (1.75-2.59)	4.29 (3.72-5.03)	7.70 (5.83-9.06)	9.42 (7.73-11.5)	525
Females	11-12	3.87 (3.13-4.78)	4.00 (3.05-4.78)	7.45 (5.71-10.3)	15.2 (10.2-17.6)	17.6 (10.8-25.6)	344
Nonsmokers†							
Total	11-12	*	< LOD	1.70 (1.54-1.95)	2.86 (2.43-3.15)	3.98 (3.25-4.30)	1317
Age group							
20-49 years	11-12	*	< LOD	1.81 (1.55-2.09)	3.02 (2.43-3.40)	4.03 (3.30-4.31)	658
50 years and older	11-12	*	< LOD	1.64 (1.43-1.92)	2.58 (2.15-3.11)	3.84 (2.95-5.08)	659
Gender							
Males	11-12	*	< LOD	1.27 (1.13-1.43)	2.03 (1.64-2.36)	2.64 (2.15-3.34)	627
Females	11-12	*	< LOD	2.07 (1.86-2.41)	3.30 (2.86-3.99)	4.30 (3.49-5.19)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary N-Acetyl-S-(phenyl)-L-cysteine (2011 – 2012)

Metabolite of Benzene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	*	.631 (<LOD-.757)	1.23 (1.09-1.36)	2.07 (1.68-2.86)	3.11 (1.93-3.78)	869
Age group							
20-49 years	11-12	*	.644 (<LOD-.710)	1.25 (1.06-1.43)	2.25 (1.69-3.05)	3.11 (1.84-3.93)	518
50 years and older	11-12	*	.627 (<LOD-.908)	1.14 (.919-1.43)	1.78 (1.43-3.24)	3.32 (1.74-4.03)	351
Gender							
Males	11-12	*	.699 (<LOD-.908)	1.35 (1.13-1.53)	2.80 (1.55-3.58)	3.58 (2.25-4.03)	525
Females	11-12	*	< LOD	1.05 (.926-1.25)	1.70 (1.42-2.07)	2.21 (1.78-2.67)	344
Nonsmokers†							
Total	11-12	*	< LOD	.956 (.888-1.07)	1.82 (1.56-2.30)	3.04 (2.18-3.79)	1318
Age group							
20-49 years	11-12	*	< LOD	1.00 (.929-1.26)	2.16 (1.75-2.75)	3.20 (2.41-3.76)	659
50 years and older	11-12	*	< LOD	.911 (.779-1.05)	1.51 (1.24-2.44)	2.84 (1.43-3.79)	659
Gender							
Males	11-12	*	.628 (<LOD-.779)	1.12 (.949-1.28)	1.77 (1.46-2.75)	3.20 (1.73-5.62)	628
Females	11-12	*	< LOD	.844 (.666-.986)	1.85 (1.37-2.44)	2.84 (1.83-3.50)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.6.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Benzene_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Benzene_FactSheet.html

Urinary N-Acetyl-S-(phenyl)-L-cysteine (creatinine corrected) (2011 – 2012)

Metabolite of Benzene

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	*	.827 (<LOD-.922)	1.33 (1.18-1.52)	2.11 (1.70-2.45)	2.53 (2.27-2.83)	869
Age group							
20-49 years	11-12	*	.771 (<LOD-.886)	1.26 (1.03-1.65)	2.11 (1.63-2.49)	2.63 (2.11-3.36)	518
50 years and older	11-12	*	.942 (<LOD-1.06)	1.37 (1.21-1.54)	2.13 (1.63-2.36)	2.53 (2.23-2.82)	351
Gender							
Males	11-12	*	.744 (<LOD-.865)	1.19 (.942-1.54)	2.03 (1.54-2.49)	2.53 (1.93-3.11)	525
Females	11-12	*	< LOD	1.41 (1.25-1.63)	2.12 (1.77-2.44)	2.64 (2.23-3.03)	344
Nonsmokers†							
Total	11-12	*	< LOD	1.29 (1.15-1.41)	2.07 (1.82-2.55)	3.26 (2.55-4.15)	1317
Age group							
20-49 years	11-12	*	< LOD	1.32 (1.15-1.57)	2.36 (1.86-2.91)	3.26 (2.65-4.90)	658
50 years and older	11-12	*	< LOD	1.25 (1.06-1.46)	1.93 (1.67-2.36)	2.83 (1.98-4.81)	659
Gender							
Males	11-12	*	.642 (<LOD-.740)	1.06 (.922-1.15)	1.79 (1.42-2.23)	2.53 (1.91-3.48)	627
Females	11-12	*	< LOD	1.51 (1.26-1.70)	2.36 (1.93-3.21)	3.86 (2.73-4.81)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Benzene_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Benzene_FactSheet.html

Urinary N-Acetyl-S-(n-propyl)-L-cysteine (2011 – 2012)

Metabolite of 1-Bromopropane

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	3.88 (3.24-4.65)	3.05 (2.48-3.87)	9.15 (6.24-13.8)	25.4 (18.2-46.7)	64.2 (29.9-105)	862
Age group							
20-49 years	11-12	4.11 (3.31-5.10)	3.45 (2.73-4.44)	9.79 (6.13-16.4)	28.1 (16.1-64.2)	58.9 (28.1-105)	516
50 years and older	11-12	3.54 (2.57-4.89)	2.68 (2.08-3.89)	7.66 (4.63-15.4)	25.1 (18.2-47.3)	68.7 (21.4-163)	346
Gender							
Males	11-12	4.16 (3.15-5.51)	3.17 (2.24-5.01)	10.6 (5.72-18.6)	29.9 (18.2-51.5)	91.2 (29.9-163)	520
Females	11-12	3.56 (3.14-4.03)	2.95 (2.25-3.87)	8.19 (5.94-10.3)	22.9 (14.6-28.4)	47.3 (25.1-68.7)	342
Nonsmokers†							
Total	11-12	4.78 (4.19-5.45)	4.38 (3.75-5.19)	12.5 (10.4-15.2)	30.0 (24.6-38.9)	56.1 (34.7-78.6)	1276
Age group							
20-49 years	11-12	5.18 (4.41-6.08)	4.82 (3.68-6.06)	13.3 (10.2-17.6)	32.4 (23.9-44.4)	64.4 (33.4-96.3)	644
50 years and older	11-12	4.38 (3.45-5.56)	4.17 (3.08-5.22)	10.5 (8.49-15.7)	27.4 (18.6-39.2)	43.7 (27.4-72.9)	632
Gender							
Males	11-12	5.26 (4.47-6.20)	4.82 (3.99-5.98)	12.5 (10.2-15.2)	33.3 (24.4-45.7)	60.9 (29.8-96.3)	607
Females	11-12	4.43 (3.79-5.16)	4.20 (3.26-5.31)	12.3 (9.84-16.6)	28.7 (20.8-39.3)	43.7 (33.1-69.4)	669

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 1.2.

Urinary N-Acetyl-S-(n-propyl)-L-cysteine (creatinine corrected) (2011 – 2012)

Metabolite of 1-Bromopropane

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	4.29 (3.71-4.95)	4.16 (3.29-5.00)	8.54 (7.85-9.58)	27.2 (16.9-38.5)	61.7 (35.1-87.5)	862
Age group							
20-49 years	11-12	4.29 (3.66-5.02)	4.38 (3.33-5.00)	8.82 (7.75-11.6)	26.0 (16.3-38.2)	47.7 (27.2-87.5)	516
50 years and older	11-12	4.29 (3.15-5.86)	3.86 (2.36-6.06)	7.85 (5.72-12.2)	36.1 (11.0-71.6)	71.6 (32.2-92.8)	346
Gender							
Males	11-12	3.94 (3.15-4.91)	3.86 (2.58-5.31)	8.24 (6.22-11.0)	26.0 (13.5-43.0)	62.0 (22.3-87.5)	520
Females	11-12	4.78 (3.89-5.86)	4.47 (2.95-6.06)	8.71 (7.55-11.6)	30.3 (12.0-61.7)	51.3 (37.2-92.8)	342
Nonsmokers†							
Total	11-12	5.59 (4.95-6.31)	5.31 (4.47-6.00)	14.0 (12.6-16.5)	36.0 (26.4-46.1)	51.8 (40.0-65.2)	1275
Age group							
20-49 years	11-12	5.72 (5.05-6.48)	5.31 (4.32-6.54)	15.3 (12.8-21.1)	36.4 (29.2-48.8)	52.6 (41.6-67.1)	643
50 years and older	11-12	5.45 (4.30-6.92)	5.14 (4.08-6.59)	12.6 (9.63-17.8)	32.7 (21.3-44.4)	49.9 (32.7-71.8)	632
Gender							
Males	11-12	4.68 (4.04-5.42)	4.28 (3.53-5.47)	12.2 (9.32-13.8)	31.0 (19.7-36.7)	46.1 (32.7-61.5)	606
Females	11-12	6.43 (5.32-7.78)	6.39 (4.70-8.20)	16.4 (12.7-24.7)	37.1 (29.3-50.3)	60.9 (43.8-80.0)	669

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Urinary N-Acetyl-S-(3,4-dihydroxybutyl)-L-cysteine (2011 – 2012)

Metabolite of 1,3-Butadiene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	350 (316-388)	370 (324-420)	618 (556-703)	981 (886-1100)	1260 (985-1600)	869
Age group							
20-49 years	11-12	357 (316-404)	392 (329-443)	614 (545-723)	979 (815-1100)	1260 (912-1600)	518
50 years and older	11-12	340 (296-391)	354 (287-427)	629 (497-754)	981 (870-1220)	1280 (981-1510)	351
Gender							
Males	11-12	391 (342-447)	411 (373-463)	706 (575-815)	1220 (870-1510)	1510 (1100-1830)	525
Females	11-12	305 (269-347)	281 (243-366)	568 (461-629)	834 (661-971)	976 (910-1010)	344
Nonsmokers†							
Total	11-12	238 (221-257)	266 (238-283)	429 (409-451)	606 (573-640)	758 (689-812)	1318
Age group							
20-49 years	11-12	233 (206-264)	258 (226-310)	437 (398-478)	620 (549-664)	746 (655-798)	659
50 years and older	11-12	244 (226-263)	271 (237-282)	422 (369-455)	596 (531-670)	790 (620-849)	659
Gender							
Males	11-12	296 (269-326)	331 (282-386)	478 (439-516)	639 (578-721)	790 (664-877)	628
Females	11-12	200 (182-221)	219 (193-236)	354 (329-388)	562 (519-607)	738 (613-828)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 5.25.

Urinary N-Acetyl-S-(3,4-dihydroxybutyl)-L-cysteine (creatinine corrected) (2011 – 2012)

Metabolite of 1,3-Butadiene

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	387 (363-412)	381 (364-403)	496 (453-555)	679 (594-741)	786 (717-853)	869
Age group							
20-49 years	11-12	372 (347-399)	357 (339-382)	469 (439-519)	681 (584-743)	777 (700-850)	518
50 years and older	11-12	411 (378-447)	408 (376-453)	521 (474-601)	668 (576-805)	833 (658-898)	351
Gender							
Males	11-12	370 (345-396)	369 (341-403)	470 (443-503)	610 (532-738)	777 (612-898)	525
Females	11-12	409 (378-443)	388 (360-450)	540 (474-622)	685 (645-741)	806 (718-893)	344
Nonsmokers†							
Total	11-12	279 (267-292)	276 (262-288)	357 (342-370)	461 (436-472)	534 (478-574)	1317
Age group							
20-49 years	11-12	256 (240-272)	249 (234-268)	321 (298-340)	399 (361-447)	498 (431-549)	658
50 years and older	11-12	307 (290-324)	301 (282-330)	394 (369-425)	491 (465-534)	566 (507-632)	659
Gender							
Males	11-12	264 (251-278)	256 (243-272)	342 (321-365)	429 (404-446)	493 (429-633)	627
Females	11-12	292 (276-308)	288 (274-308)	367 (348-388)	474 (450-524)	549 (498-578)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Urinary N-Acetyl-S-(1-hydroxymethyl-2-propenyl)-L-cysteine (2011 – 2012)

Metabolite of 1,3-Butadiene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	869
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	518
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	351
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	< LOD	525
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	344
Nonsmokers†							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	1318
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	659
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	659
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	< LOD	628
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.7.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary N-Acetyl-S-(1-hydroxymethyl-2-propenyl)-L-cysteine (creatinine corrected) (2011 – 2012)

Metabolite of 1,3-Butadiene

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	869
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	518
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	351
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	< LOD	525
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	344
Nonsmokers†							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	1317
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	658
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	659
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	< LOD	627
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary N-Acetyl-S-(2-hydroxy-3-butenyl)-L-cysteine (2011 – 2012)

Metabolite of 1,3-Butadiene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	*	1.03 (.868-1.19)	2.67 (2.20-3.61)	6.15 (5.12-7.79)	8.99 (7.71-10.0)	869
Age group							
20-49 years	11-12	*	.834 (<LOD-1.11)	2.61 (2.00-3.31)	6.01 (3.99-8.50)	8.95 (6.22-9.94)	518
50 years and older	11-12	1.47 (1.24-1.73)	1.29 (1.07-1.55)	3.09 (2.21-4.92)	7.56 (5.22-8.91)	9.43 (7.79-12.4)	351
Gender							
Males	11-12	*	.966 (.754-1.21)	2.62 (1.82-4.86)	6.22 (4.87-8.91)	9.43 (7.67-10.1)	525
Females	11-12	*	1.07 (.707-1.29)	2.74 (2.31-3.79)	6.07 (4.50-7.71)	8.14 (6.55-11.1)	344
Nonsmokers†							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	1318
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	659
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	659
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	< LOD	628
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.7.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary N-Acetyl-S-(2-hydroxy-3-butenyl)-L-cysteine (creatinine corrected) (2011 – 2012)

Metabolite of 1,3-Butadiene

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	*	1.46 (1.18-1.74)	3.07 (2.72-3.75)	5.76 (4.74-7.06)	7.84 (5.68-11.0)	869
Age group							
20-49 years	11-12	*	1.21 (<LOD-1.56)	2.86 (2.34-3.41)	5.33 (4.08-6.45)	7.06 (6.01-9.68)	518
50 years and older	11-12	1.77 (1.48-2.13)	1.63 (1.27-2.06)	3.75 (3.01-4.67)	6.67 (4.42-9.12)	7.87 (4.74-15.0)	351
Gender							
Males	11-12	*	1.18 (.952-1.52)	2.68 (1.90-3.25)	4.83 (3.70-5.65)	6.32 (4.86-9.12)	525
Females	11-12	*	1.83 (1.22-2.81)	4.00 (3.06-5.52)	6.88 (5.30-8.60)	8.60 (6.73-13.9)	344
Nonsmokers†							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	1317
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	658
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	659
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	< LOD	627
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary N-Acetyl-S-(4-hydroxy-2-butenyl)-L-cysteine (2011 – 2012)

Metabolite of 1,3-Butadiene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	28.4 (25.3-31.9)	31.9 (27.4-38.6)	61.2 (52.5-70.4)	97.1 (87.6-107)	124 (109-133)	869
Age group							
20-49 years	11-12	25.9 (21.9-30.6)	28.2 (23.2-37.4)	54.8 (45.4-62.6)	86.3 (72.7-98.9)	109 (94.4-138)	518
50 years and older	11-12	32.7 (26.7-40.2)	40.4 (31.4-46.3)	77.7 (55.7-92.1)	108 (87.2-130)	133 (99.8-193)	351
Gender							
Males	11-12	28.4 (23.3-34.7)	31.4 (23.2-41.1)	68.1 (49.2-78.6)	106 (89.0-129)	133 (107-171)	525
Females	11-12	28.3 (25.4-31.5)	34.1 (28.2-40.0)	57.6 (47.7-63.1)	87.2 (75.4-98.9)	108 (89.9-125)	344
Nonsmokers†							
Total	11-12	3.93 (3.60-4.30)	4.03 (3.78-4.39)	7.23 (6.72-7.74)	11.6 (10.5-13.0)	14.9 (13.4-17.7)	1318
Age group							
20-49 years	11-12	3.99 (3.45-4.63)	4.24 (3.59-4.92)	7.33 (6.57-8.66)	12.6 (10.5-14.7)	20.5 (13.5-25.8)	659
50 years and older	11-12	3.87 (3.52-4.26)	3.96 (3.65-4.46)	7.23 (6.16-7.84)	10.7 (9.56-12.1)	13.6 (11.5-14.9)	659
Gender							
Males	11-12	4.99 (4.58-5.43)	5.17 (4.59-5.80)	7.84 (7.23-8.66)	12.9 (10.7-14.6)	15.8 (14.3-20.7)	628
Females	11-12	3.26 (2.83-3.77)	3.29 (2.85-3.77)	6.46 (5.74-7.28)	10.6 (9.11-12.4)	13.5 (11.7-19.9)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.6.

Urinary N-Acetyl-S-(4-hydroxy-2-butenyl)-L-cysteine (creatinine corrected) (2011 – 2012)

Metabolite of 1,3-Butadiene

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	31.3 (28.1-34.9)	35.2 (29.7-40.0)	63.9 (53.2-70.3)	95.0 (81.1-114)	124 (102-150)	869
Age group							
20-49 years	11-12	27.0 (23.4-31.1)	29.9 (24.3-35.3)	51.4 (42.9-64.8)	84.1 (71.8-95.0)	106 (85.3-137)	518
50 years and older	11-12	39.6 (33.1-47.3)	45.4 (35.4-57.4)	75.5 (67.7-86.7)	115 (83.5-153)	126 (86.7-180)	351
Gender							
Males	11-12	26.9 (23.7-30.6)	29.6 (25.3-34.6)	50.0 (40.0-58.7)	76.7 (71.6-85.0)	99.0 (79.3-118)	525
Females	11-12	38.0 (30.8-46.8)	45.2 (35.4-57.4)	74.7 (65.3-91.2)	118 (89.0-150)	150 (118-180)	344
Nonsmokers†							
Total	11-12	4.62 (4.26-5.00)	4.43 (3.89-4.89)	7.04 (6.42-7.41)	10.4 (9.25-11.6)	13.5 (11.9-16.3)	1317
Age group							
20-49 years	11-12	4.39 (3.90-4.94)	4.18 (3.42-4.99)	7.04 (5.83-7.64)	10.2 (8.70-12.8)	14.8 (10.8-22.4)	658
50 years and older	11-12	4.87 (4.49-5.29)	4.50 (4.05-5.16)	7.04 (6.44-8.00)	10.8 (8.95-12.0)	12.5 (11.5-14.1)	659
Gender							
Males	11-12	4.46 (4.16-4.77)	4.11 (3.81-4.57)	6.68 (6.11-7.36)	10.1 (8.69-11.6)	12.1 (11.0-14.0)	627
Females	11-12	4.74 (4.22-5.34)	4.52 (3.89-5.33)	7.18 (6.24-7.96)	11.1 (9.04-13.5)	14.0 (11.8-21.5)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Urinary 2-Thioxothiazolidine-4-carboxylic acid (2011 – 2012)

Metabolite of Carbon disulfide

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	*	< LOD	22.4 (17.2-25.1)	46.1 (37.0-62.7)	89.0 (60.1-161)	869
Age group							
20-49 years	11-12	*	< LOD	20.7 (14.1-24.6)	41.6 (28.1-64.9)	83.8 (52.2-146)	518
50 years and older	11-12	*	< LOD	25.1 (16.4-32.7)	60.1 (34.1-89.0)	89.0 (58.2-415)	351
Gender							
Males	11-12	*	< LOD	22.3 (15.2-34.1)	46.0 (37.0-60.8)	83.2 (52.2-161)	525
Females	11-12	*	< LOD	22.7 (14.1-25.1)	46.2 (30.0-69.4)	89.0 (36.7-419)	344
Nonsmokers†							
Total	11-12	*	< LOD	18.0 (14.3-21.7)	53.5 (37.8-69.5)	114 (76.9-145)	1318
Age group							
20-49 years	11-12	*	< LOD	18.5 (12.4-26.1)	56.8 (36.8-91.6)	115 (70.0-159)	659
50 years and older	11-12	*	< LOD	17.5 (12.4-22.5)	47.6 (32.8-59.0)	114 (59.0-178)	659
Gender							
Males	11-12	*	< LOD	26.4 (19.5-30.5)	73.7 (51.9-121)	159 (96.4-198)	628
Females	11-12	*	< LOD	13.2 (<LOD-17.3)	35.7 (26.7-44.7)	73.1 (49.8-103)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 11.2.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 2-Thioxothiazolidine-4-carboxylic acid (creatinine corrected) (2011 – 2012)

Metabolite of Carbon disulfide

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	*	< LOD	27.2 (23.2-32.9)	57.9 (46.5-71.7)	88.1 (71.7-141)	869
Age group							
20-49 years	11-12	*	< LOD	25.2 (20.4-32.9)	51.3 (43.8-57.9)	91.3 (57.6-169)	518
50 years and older	11-12	*	< LOD	30.4 (23.2-49.8)	71.7 (35.9-87.8)	88.1 (71.7-220)	351
Gender							
Males	11-12	*	< LOD	24.7 (18.0-32.9)	49.8 (43.9-60.6)	78.7 (57.5-141)	525
Females	11-12	*	< LOD	31.6 (23.2-51.3)	71.7 (41.6-87.8)	88.1 (57.6-344)	344
Nonsmokers†							
Total	11-12	*	< LOD	27.5 (23.2-29.9)	60.8 (50.8-76.3)	110 (84.5-164)	1317
Age group							
20-49 years	11-12	*	< LOD	27.5 (21.0-35.4)	60.8 (44.9-94.8)	103 (66.0-154)	658
50 years and older	11-12	*	< LOD	27.2 (23.1-29.3)	56.7 (41.6-75.4)	144 (71.8-223)	659
Gender							
Males	11-12	*	< LOD	23.2 (20.3-29.9)	55.9 (44.3-79.1)	116 (58.4-230)	627
Females	11-12	*	< LOD	29.3 (<LOD-32.9)	61.7 (44.2-96.7)	104 (80.5-161)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary N-Acetyl-S-(3-hydroxypropyl-1-methyl)-L-cysteine (2011 – 2012)

Metabolite of Crotonaldehyde

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	1760 (1550-1990)	2000 (1600-2360)	3880 (3340-4370)	6980 (5940-7570)	7910 (7610-8720)	869
Age group							
20-49 years	11-12	1590 (1330-1900)	1680 (1270-2250)	3570 (2730-4250)	6060 (4580-7110)	7790 (6310-8880)	518
50 years and older	11-12	2050 (1700-2470)	2480 (1860-2890)	4450 (3520-5410)	7540 (6690-7830)	8720 (7500-9650)	351
Gender							
Males	11-12	1780 (1450-2170)	2050 (1320-2660)	4100 (3390-4460)	7050 (5460-7790)	8410 (7680-9120)	525
Females	11-12	1730 (1570-1910)	2000 (1640-2250)	3700 (3090-4200)	6510 (4570-7700)	7910 (6960-8880)	344
Nonsmokers†							
Total	11-12	338 (320-358)	342 (317-370)	594 (538-638)	930 (845-1030)	1360 (984-2120)	1318
Age group							
20-49 years	11-12	336 (305-372)	342 (297-397)	623 (525-683)	949 (834-1050)	1200 (970-2270)	659
50 years and older	11-12	341 (313-370)	342 (291-411)	575 (492-649)	891 (809-1070)	1460 (904-2120)	659
Gender							
Males	11-12	408 (383-436)	422 (366-460)	659 (619-697)	992 (880-1110)	1390 (1030-1890)	628
Females	11-12	292 (265-321)	284 (248-323)	509 (473-568)	888 (721-1030)	1240 (851-2710)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 2.0.

Urinary N-Acetyl-S-(3-hydroxypropyl-1-methyl)-L-cysteine (creatinine corrected) (2011 – 2012)

Metabolite of Crotonaldehyde

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	1940 (1730-2170)	2170 (1850-2440)	3930 (3500-4700)	6290 (5650-7250)	7880 (6740-9140)	869
Age group							
20-49 years	11-12	1660 (1420-1940)	1710 (1440-2070)	3400 (2700-4110)	5830 (5250-6560)	7630 (6450-8530)	518
50 years and older	11-12	2480 (2140-2870)	2890 (2410-3430)	4850 (3920-5710)	6780 (5710-8670)	8380 (5840-12500)	351
Gender							
Males	11-12	1680 (1480-1920)	1820 (1350-2250)	3230 (2640-3770)	5810 (4260-6270)	7250 (5810-8790)	525
Females	11-12	2320 (1900-2840)	2810 (2270-3310)	5210 (3870-5830)	6930 (5830-8530)	9140 (7200-10500)	344
Nonsmokers†							
Total	11-12	397 (367-428)	362 (326-399)	521 (484-563)	803 (706-977)	1230 (974-1480)	1317
Age group							
20-49 years	11-12	369 (328-415)	316 (288-357)	483 (412-582)	770 (641-1130)	1330 (760-3180)	658
50 years and older	11-12	429 (401-459)	396 (362-429)	536 (495-595)	826 (720-938)	1080 (938-1310)	659
Gender							
Males	11-12	364 (343-386)	333 (302-364)	484 (433-530)	742 (623-938)	1020 (838-1300)	627
Females	11-12	424 (385-468)	378 (345-412)	539 (487-605)	881 (720-1110)	1330 (961-2250)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Urinary 2-Aminothiazoline-4-carboxylic acid (2011 – 2012)

Metabolite of Cyanide

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	118 (103-136)	128 (112-144)	238 (197-290)	439 (339-514)	610 (487-758)	869
Age group							
20-49 years	11-12	115 (99.3-134)	126 (107-148)	227 (190-252)	430 (311-524)	551 (439-683)	518
50 years and older	11-12	123 (95.9-157)	134 (99.3-175)	264 (172-327)	487 (317-689)	721 (451-991)	351
Gender							
Males	11-12	94.4 (79.4-112)	100 (81.4-126)	191 (165-234)	307 (247-359)	381 (294-635)	525
Females	11-12	157 (134-184)	162 (143-189)	327 (238-439)	558 (439-744)	755 (536-997)	344
Nonsmokers†							
Total	11-12	96.0 (87.0-106)	103 (92.9-112)	191 (170-220)	327 (293-364)	442 (378-508)	1318
Age group							
20-49 years	11-12	93.0 (81.3-106)	101 (82.4-111)	189 (160-226)	323 (272-408)	478 (342-543)	659
50 years and older	11-12	99.3 (89.9-110)	108 (94.6-125)	192 (176-220)	331 (292-364)	414 (356-501)	659
Gender							
Males	11-12	78.6 (69.4-89.0)	80.4 (69.2-94.6)	144 (131-175)	265 (217-386)	414 (285-524)	628
Females	11-12	112 (99.0-127)	127 (104-149)	226 (194-257)	342 (315-375)	478 (404-521)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 15.0.

Urinary 2-Aminothiazoline-4-carboxylic acid (creatinine corrected) (2011 – 2012)

Metabolite of Cyanide

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	130 (119-143)	133 (115-155)	248 (225-285)	412 (366-449)	516 (440-623)	869
Age group							
20-49 years	11-12	120 (108-133)	128 (113-151)	225 (208-252)	344 (285-406)	412 (366-514)	518
50 years and older	11-12	148 (125-176)	140 (102-185)	327 (247-399)	477 (422-623)	635 (449-925)	351
Gender							
Males	11-12	89.4 (79.9-100)	91.1 (81.1-101)	151 (133-167)	268 (210-326)	390 (286-477)	525
Females	11-12	210 (192-231)	224 (207-258)	363 (307-411)	510 (440-575)	674 (450-925)	344
Nonsmokers†							
Total	11-12	113 (103-123)	123 (112-135)	217 (196-237)	350 (316-372)	418 (372-489)	1317
Age group							
20-49 years	11-12	102 (92.7-112)	112 (98.0-127)	194 (170-218)	315 (260-350)	374 (340-411)	658
50 years and older	11-12	125 (113-138)	132 (118-148)	240 (220-280)	372 (333-415)	489 (418-546)	659
Gender							
Males	11-12	70.1 (61.0-80.5)	69.0 (57.4-80.9)	126 (109-153)	228 (180-284)	322 (254-411)	627
Females	11-12	163 (148-180)	170 (154-188)	274 (236-309)	377 (353-418)	478 (400-546)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Urinary N-Acetyl-S-(N-methylcarbamoyl)-L-cysteine (2011 – 2012)

Metabolite of N,N-Dimethylformamide

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	459 (400-527)	471 (407-573)	855 (746-1030)	1440 (1210-1790)	2050 (1570-2320)	869
Age group							
20-49 years	11-12	426 (368-492)	454 (387-534)	808 (704-950)	1260 (1120-1490)	1520 (1240-2050)	518
50 years and older	11-12	517 (420-638)	552 (397-693)	944 (765-1220)	2010 (1470-2290)	2490 (1500-3590)	351
Gender							
Males	11-12	462 (376-568)	475 (363-614)	944 (750-1120)	1570 (1180-2050)	2050 (1400-2550)	525
Females	11-12	456 (410-507)	466 (401-595)	808 (686-950)	1280 (1050-1650)	1660 (1440-2260)	344
Nonsmokers†							
Total	11-12	124 (116-132)	130 (120-140)	248 (226-262)	401 (350-466)	526 (451-621)	1318
Age group							
20-49 years	11-12	109 (96.3-124)	114 (102-124)	219 (186-251)	370 (302-429)	526 (355-661)	659
50 years and older	11-12	142 (131-154)	145 (140-159)	284 (242-324)	422 (373-470)	526 (470-687)	659
Gender							
Males	11-12	143 (131-156)	150 (132-174)	254 (234-283)	395 (333-442)	512 (422-594)	628
Females	11-12	111 (101-122)	111 (103-123)	226 (202-262)	404 (333-491)	552 (451-702)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 6.26.

Urinary N-Acetyl-S-(N-methylcarbamoyl)-L-cysteine (creatinine corrected) (2011 – 2012)

Metabolite of N,N-Dimethylformamide

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	507 (446-577)	536 (487-637)	853 (741-1000)	1190 (1080-1370)	1450 (1230-1650)	869
Age group							
20-49 years	11-12	443 (391-503)	477 (373-564)	718 (628-870)	1080 (941-1310)	1340 (1150-1800)	518
50 years and older	11-12	626 (530-738)	693 (585-831)	1060 (845-1150)	1270 (1130-1580)	1540 (1200-1810)	351
Gender							
Males	11-12	437 (373-513)	467 (369-574)	718 (593-833)	1050 (807-1350)	1340 (938-1820)	525
Females	11-12	612 (528-709)	692 (583-813)	1060 (916-1150)	1340 (1150-1580)	1580 (1380-1810)	344
Nonsmokers†							
Total	11-12	145 (137-155)	147 (136-159)	245 (221-265)	369 (353-397)	442 (397-541)	1317
Age group							
20-49 years	11-12	120 (109-132)	122 (113-133)	196 (178-219)	305 (246-379)	391 (319-442)	658
50 years and older	11-12	179 (165-194)	175 (152-202)	308 (262-336)	422 (369-449)	541 (431-673)	659
Gender							
Males	11-12	128 (117-139)	135 (118-147)	200 (187-227)	315 (261-358)	379 (331-484)	627
Females	11-12	161 (150-173)	160 (146-176)	274 (248-313)	413 (363-440)	479 (424-655)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Urinary Phenylglyoxylic acid (2011 – 2012)

Metabolite of Ethylbenzene and Styrene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	308 (270-350)	344 (298-387)	560 (471-655)	900 (765-1040)	1140 (900-1530)	869
Age group							
20-49 years	11-12	306 (260-361)	355 (298-412)	585 (460-687)	900 (731-1060)	1100 (900-1330)	518
50 years and older	11-12	310 (266-362)	324 (254-419)	527 (462-664)	864 (664-1290)	1280 (774-1730)	351
Gender							
Males	11-12	338 (274-417)	390 (313-437)	624 (501-796)	1060 (810-1330)	1330 (901-1730)	525
Females	11-12	273 (248-301)	297 (248-347)	478 (446-566)	755 (660-819)	899 (778-994)	344
Nonsmokers†							
Total	11-12	159 (146-174)	184 (168-197)	298 (269-321)	420 (388-459)	559 (473-644)	1318
Age group							
20-49 years	11-12	158 (139-180)	186 (161-211)	312 (274-359)	448 (393-551)	622 (514-726)	659
50 years and older	11-12	160 (145-177)	181 (161-198)	278 (240-312)	402 (369-431)	486 (420-588)	659
Gender							
Males	11-12	190 (168-216)	215 (189-248)	337 (304-371)	458 (413-523)	562 (508-630)	628
Females	11-12	138 (125-153)	146 (135-169)	242 (221-284)	392 (347-438)	551 (406-722)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 12.0.

Biomonitoring Summaries

http://www.cdc.gov/biomonitoring/Ethylbenzene_BiomonitoringSummary.html

http://www.cdc.gov/biomonitoring/Styrene_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Styrene_FactSheet.html

Urinary Phenylglyoxylic acid (creatinine corrected) (2011 – 2012)

Metabolite of Ethylbenzene and Styrene

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	340 (306-378)	362 (310-397)	518 (469-573)	681 (586-774)	786 (699-959)	869
Age group							
20-49 years	11-12	319 (285-357)	335 (279-383)	481 (416-536)	630 (559-707)	751 (630-841)	518
50 years and older	11-12	375 (332-424)	390 (374-428)	576 (470-681)	726 (583-874)	874 (716-1120)	351
Gender							
Males	11-12	320 (283-362)	336 (285-389)	481 (404-528)	600 (536-717)	731 (583-874)	525
Females	11-12	366 (310-434)	381 (302-471)	576 (471-677)	726 (617-841)	841 (716-1120)	344
Nonsmokers†							
Total	11-12	187 (173-201)	195 (179-209)	255 (242-270)	329 (313-357)	397 (358-426)	1317
Age group							
20-49 years	11-12	173 (161-187)	177 (163-198)	235 (226-251)	303 (276-329)	366 (314-426)	658
50 years and older	11-12	202 (187-218)	210 (195-227)	278 (260-291)	357 (329-379)	407 (360-452)	659
Gender							
Males	11-12	170 (155-186)	173 (158-194)	228 (218-239)	304 (264-347)	360 (314-400)	627
Females	11-12	201 (185-218)	207 (200-226)	274 (252-291)	349 (315-402)	413 (366-482)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Biomonitoring Summaries

http://www.cdc.gov/biomonitoring/Ethylbenzene_BiomonitoringSummary.html

http://www.cdc.gov/biomonitoring/Styrene_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Styrene_FactSheet.html

Urinary N-Acetyl-S-(2-hydroxypropyl)-L-cysteine (2011 – 2012)

Metabolite of Propylene oxide

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	57.4 (51.7-63.8)	60.2 (50.8-67.8)	118 (103-129)	198 (160-225)	269 (225-322)	869
Age group							
20-49 years	11-12	54.5 (47.8-62.1)	58.0 (49.4-64.6)	109 (87.0-129)	169 (149-197)	235 (197-272)	518
50 years and older	11-12	62.4 (49.0-79.5)	61.3 (44.0-94.1)	124 (100-169)	228 (150-398)	314 (212-760)	351
Gender							
Males	11-12	59.4 (50.9-69.3)	61.3 (53.8-72.8)	120 (94.7-140)	202 (148-244)	270 (216-398)	525
Females	11-12	55.0 (48.8-62.0)	54.7 (46.6-64.0)	118 (101-127)	179 (155-219)	266 (181-375)	344
Nonsmokers†							
Total	11-12	29.3 (26.3-32.7)	27.0 (24.2-30.8)	51.3 (45.1-60.2)	109 (94.7-130)	286 (171-392)	1318
Age group							
20-49 years	11-12	31.4 (27.6-35.7)	29.7 (25.3-33.5)	58.0 (47.8-68.4)	114 (91.9-178)	250 (130-443)	659
50 years and older	11-12	27.2 (22.8-32.5)	24.8 (20.9-29.7)	46.8 (37.9-57.4)	105 (73.3-171)	293 (113-569)	659
Gender							
Males	11-12	32.5 (28.2-37.6)	31.2 (26.2-35.8)	51.3 (42.1-65.7)	93.0 (73.9-119)	199 (111-334)	628
Females	11-12	27.0 (23.2-31.5)	22.9 (19.1-27.3)	51.3 (42.5-64.0)	126 (95.7-191)	313 (178-498)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 5.3.

Urinary N-Acetyl-S-(2-hydroxypropyl)-L-cysteine (creatinine corrected) (2011 – 2012)

Metabolite of Propylene oxide

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	63.4 (56.6-71.1)	63.6 (54.5-71.8)	110 (91.4-129)	181 (148-218)	251 (191-337)	869
Age group							
20-49 years	11-12	56.8 (52.4-61.5)	55.6 (45.9-65.5)	104 (82.4-118)	160 (133-207)	218 (164-267)	518
50 years and older	11-12	75.4 (60.2-94.3)	72.5 (58.0-84.7)	123 (92.9-171)	214 (144-337)	322 (155-793)	351
Gender							
Males	11-12	56.3 (49.3-64.3)	54.7 (45.1-66.8)	86.5 (75.2-110)	139 (116-196)	201 (144-251)	525
Females	11-12	73.8 (62.9-86.6)	74.7 (64.6-91.4)	139 (108-169)	216 (160-284)	284 (195-337)	344
Nonsmokers†							
Total	11-12	34.4 (30.9-38.3)	28.5 (26.6-30.9)	50.2 (43.2-56.1)	101 (82.6-136)	291 (167-527)	1317
Age group							
20-49 years	11-12	34.5 (31.1-38.2)	28.6 (27.2-30.9)	52.6 (46.9-59.2)	102 (79.3-167)	217 (105-516)	658
50 years and older	11-12	34.3 (28.8-40.8)	28.4 (25.2-31.9)	45.9 (40.6-54.2)	99.2 (70.4-190)	366 (99.2-1050)	659
Gender							
Males	11-12	29.0 (26.0-32.4)	26.7 (24.2-29.2)	41.3 (34.2-46.9)	66.6 (53.6-98.0)	128 (82.3-240)	627
Females	11-12	39.3 (32.6-47.3)	30.9 (26.5-35.0)	60.0 (48.9-73.4)	163 (93.7-224)	516 (167-1240)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Urinary N-Acetyl-S-(phenyl-2-hydroxyethyl)-L-cysteine (2011 – 2012)

Metabolite of Styrene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	1.18 (.989-1.40)	.979 (.731-1.22)	2.20 (1.62-2.86)	4.34 (3.20-6.16)	6.21 (4.96-8.76)	869
Age group							
20-49 years	11-12	1.13 (.944-1.34)	.903 (.706-1.14)	2.04 (1.32-2.93)	4.72 (3.02-6.16)	6.26 (4.37-13.2)	518
50 years and older	11-12	1.26 (1.02-1.55)	1.22 (.813-1.44)	2.50 (1.63-3.20)	4.22 (3.20-6.02)	6.02 (4.10-6.96)	351
Gender							
Males	11-12	1.29 (1.02-1.62)	1.11 (.706-1.44)	2.71 (1.86-3.26)	5.41 (3.44-6.75)	6.86 (4.72-17.2)	525
Females	11-12	*	.898 (<LOD-1.11)	1.70 (1.32-2.20)	3.57 (2.59-4.75)	5.22 (3.26-9.12)	344
Nonsmokers†							
Total	11-12	*	< LOD	.713 (<LOD-.832)	1.39 (1.25-1.65)	1.91 (1.70-2.24)	1318
Age group							
20-49 years	11-12	*	< LOD	.795 (<LOD-.889)	1.60 (1.36-1.81)	2.08 (1.81-2.70)	659
50 years and older	11-12	*	< LOD	< LOD	1.28 (.997-1.65)	1.75 (1.32-1.93)	659
Gender							
Males	11-12	*	< LOD	.795 (<LOD-.906)	1.66 (1.23-1.91)	2.03 (1.87-2.61)	628
Females	11-12	*	< LOD	< LOD	1.31 (1.07-1.58)	1.75 (1.39-2.16)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.7.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Styrene_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Styrene_FactSheet.html

Urinary N-Acetyl-S-(phenyl-2-hydroxyethyl)-L-cysteine (creatinine corrected) (2011 – 2012)

Metabolite of Styrene

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	1.30 (1.16-1.46)	1.26 (1.10-1.43)	2.35 (1.92-2.70)	3.59 (3.09-4.21)	4.88 (4.06-6.42)	869
Age group							
20-49 years	11-12	1.17 (1.01-1.36)	1.13 (.927-1.39)	2.03 (1.82-2.42)	3.30 (2.77-4.50)	4.95 (3.43-7.53)	518
50 years and older	11-12	1.52 (1.33-1.73)	1.41 (1.23-1.64)	2.73 (2.03-3.10)	4.02 (3.29-4.64)	4.88 (4.02-7.03)	351
Gender							
Males	11-12	1.22 (1.05-1.41)	1.10 (1.01-1.27)	1.96 (1.67-2.52)	3.43 (2.75-4.33)	5.07 (3.43-9.42)	525
Females	11-12	*	1.45 (<LOD-1.65)	2.52 (2.15-2.78)	4.02 (3.01-4.64)	4.88 (4.02-7.09)	344
Nonsmokers†							
Total	11-12	*	< LOD	1.21 (<LOD-1.27)	1.98 (1.77-2.15)	2.74 (2.25-3.48)	1317
Age group							
20-49 years	11-12	*	< LOD	1.21 (<LOD-1.38)	1.98 (1.65-2.62)	2.91 (2.25-3.81)	658
50 years and older	11-12	*	< LOD	< LOD	1.83 (1.76-2.06)	2.36 (2.02-3.54)	659
Gender							
Males	11-12	*	< LOD	.952 (<LOD-1.05)	1.38 (1.24-1.71)	1.98 (1.55-2.65)	627
Females	11-12	*	< LOD	< LOD	2.15 (1.98-2.75)	3.30 (2.46-4.13)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Styrene_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Styrene_FactSheet.html

Urinary Mandelic acid (2011 – 2012)

Metabolite of Styrene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	240 (208-276)	238 (210-300)	422 (386-508)	761 (614-871)	1030 (823-1250)	869
Age group							
20-49 years	11-12	238 (198-287)	243 (204-319)	425 (386-517)	767 (578-931)	1030 (789-1380)	518
50 years and older	11-12	242 (213-275)	223 (200-284)	410 (381-508)	761 (563-863)	1030 (814-1090)	351
Gender							
Males	11-12	260 (213-317)	270 (223-321)	543 (398-632)	863 (702-1090)	1250 (966-1380)	525
Females	11-12	216 (192-244)	219 (188-243)	386 (327-410)	567 (428-730)	740 (589-914)	344
Nonsmokers†							
Total	11-12	109 (98.1-121)	118 (103-133)	200 (165-228)	301 (269-329)	392 (346-449)	1318
Age group							
20-49 years	11-12	116 (100-135)	129 (110-153)	221 (191-248)	327 (270-376)	429 (353-488)	659
50 years and older	11-12	101 (92.8-111)	110 (95.0-124)	165 (146-200)	287 (219-316)	357 (301-416)	659
Gender							
Males	11-12	134 (122-147)	141 (119-159)	217 (190-252)	319 (267-357)	407 (329-559)	628
Females	11-12	92.4 (81.0-105)	100 (84.0-118)	166 (146-207)	292 (236-346)	381 (316-434)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 12.0.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Styrene_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Styrene_FactSheet.html

Urinary Mandelic acid (creatinine corrected) (2011 – 2012)

Metabolite of Styrene

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	265 (242-290)	266 (242-277)	407 (369-441)	598 (526-671)	742 (650-850)	869
Age group							
20-49 years	11-12	248 (225-274)	255 (225-272)	378 (362-414)	571 (510-670)	710 (634-768)	518
50 years and older	11-12	292 (264-323)	277 (258-319)	440 (369-468)	598 (491-761)	821 (576-988)	351
Gender							
Males	11-12	246 (220-276)	239 (205-272)	372 (343-414)	613 (471-694)	715 (670-812)	525
Females	11-12	290 (250-336)	283 (260-341)	459 (366-512)	557 (514-743)	743 (557-821)	344
Nonsmokers†							
Total	11-12	128 (119-137)	124 (115-133)	168 (157-186)	245 (221-273)	306 (276-347)	1317
Age group							
20-49 years	11-12	128 (118-138)	124 (116-133)	167 (155-188)	229 (208-276)	306 (263-347)	658
50 years and older	11-12	128 (118-139)	125 (110-139)	169 (150-202)	255 (220-290)	303 (258-398)	659
Gender							
Males	11-12	120 (113-126)	114 (105-124)	156 (141-166)	208 (189-239)	275 (241-306)	627
Females	11-12	134 (123-147)	132 (122-145)	188 (169-202)	273 (229-304)	328 (299-383)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Styrene_BiomonitoringSummary.html

Factsheet

http://www.cdc.gov/biomonitoring/Styrene_FactSheet.html

Urinary N-Acetyl-S-(trichlorovinyl)-L-cysteine (2011 – 2012)

Metabolite of Tetrachloroethene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	869
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	518
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	351
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	< LOD	525
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	344
Nonsmokers†							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	1318
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	659
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	659
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	< LOD	628
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 3.0.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/HalogenatedSolvents_BiomonitoringSummary.html

Urinary N-Acetyl-S-(trichlorovinyl)-L-cysteine (creatinine corrected) (2011 – 2012)

Metabolite of Tetrachloroethene

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	869
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	518
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	351
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	< LOD	525
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	344
Nonsmokers†							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	1317
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	658
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	659
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	< LOD	627
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
 < LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/HalogenatedSolvents_BiomonitoringSummary.html

Urinary N-Acetyl-S-(benzyl)-L-cysteine (2011 – 2012)

Metabolite of Toluene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	6.14 (5.50-6.87)	5.97 (5.33-6.87)	12.2 (9.69-16.1)	24.6 (17.5-32.1)	38.7 (29.9-54.4)	869
Age group							
20-49 years	11-12	6.22 (5.41-7.16)	6.04 (5.05-7.26)	12.3 (9.43-16.9)	26.9 (16.9-40.5)	40.5 (29.9-54.5)	518
50 years and older	11-12	6.02 (5.17-7.02)	5.92 (5.08-7.28)	12.0 (8.37-17.3)	22.5 (17.5-27.9)	33.5 (25.4-46.5)	351
Gender							
Males	11-12	6.63 (5.73-7.67)	7.09 (5.94-7.95)	13.9 (11.1-16.9)	26.9 (17.3-35.1)	35.1 (29.9-44.4)	525
Females	11-12	5.58 (4.81-6.47)	5.33 (4.66-5.80)	10.6 (7.02-14.3)	20.8 (14.8-33.5)	40.5 (24.2-60.3)	344
Nonsmokers†							
Total	11-12	6.50 (5.98-7.07)	6.41 (6.00-6.97)	12.2 (10.2-14.4)	23.3 (19.7-29.1)	38.6 (29.9-54.9)	1318
Age group							
20-49 years	11-12	6.65 (5.81-7.61)	6.31 (5.39-8.17)	12.4 (10.4-16.2)	28.4 (20.2-34.2)	43.6 (33.3-60.1)	659
50 years and older	11-12	6.35 (5.78-6.97)	6.53 (5.89-7.21)	11.1 (9.86-13.4)	20.6 (18.0-25.3)	34.2 (25.5-39.7)	659
Gender							
Males	11-12	6.97 (6.22-7.82)	6.74 (6.13-7.65)	12.3 (10.1-14.8)	22.8 (18.2-31.2)	39.7 (25.0-86.2)	628
Females	11-12	6.15 (5.47-6.93)	6.18 (5.39-6.96)	12.1 (9.54-16.1)	25.3 (19.1-29.7)	37.0 (29.7-51.6)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.5.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Toluene_BiomonitoringSummary.html

Urinary N-Acetyl-S-(benzyl)-L-cysteine (creatinine corrected) (2011 – 2012)

Metabolite of Toluene

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	6.78 (6.39-7.19)	6.02 (5.70-6.38)	11.2 (9.43-12.6)	19.7 (16.5-20.6)	26.2 (22.6-36.2)	869
Age group							
20-49 years	11-12	6.48 (5.95-7.06)	5.84 (5.41-6.53)	9.33 (8.50-11.3)	20.4 (13.9-21.0)	25.5 (20.5-40.0)	518
50 years and older	11-12	7.28 (6.56-8.08)	6.12 (5.79-7.71)	14.3 (10.2-15.3)	19.5 (15.5-23.6)	29.3 (22.6-47.7)	351
Gender							
Males	11-12	6.28 (5.77-6.83)	5.78 (5.36-6.26)	9.33 (8.50-11.2)	17.9 (15.2-20.4)	22.2 (20.4-27.5)	525
Females	11-12	7.48 (6.45-8.68)	6.55 (5.44-7.52)	13.0 (10.2-15.2)	21.0 (16.5-28.3)	40.0 (25.3-51.8)	344
Nonsmokers†							
Total	11-12	7.63 (7.06-8.25)	6.87 (6.31-7.58)	12.8 (11.3-14.4)	23.8 (19.3-28.1)	39.6 (29.7-51.4)	1317
Age group							
20-49 years	11-12	7.31 (6.71-7.97)	6.48 (5.95-7.22)	12.0 (10.9-13.7)	22.2 (18.3-25.7)	36.4 (24.5-49.1)	658
50 years and older	11-12	7.99 (7.26-8.79)	7.47 (6.59-8.01)	13.6 (11.5-16.0)	26.1 (18.2-37.3)	44.1 (31.0-55.5)	659
Gender							
Males	11-12	6.23 (5.67-6.85)	5.76 (5.28-6.09)	8.96 (8.07-10.5)	17.4 (14.2-23.4)	32.0 (19.0-44.0)	627
Females	11-12	8.95 (7.99-10.0)	8.11 (7.24-9.19)	15.3 (13.1-17.6)	26.1 (23.0-31.8)	44.7 (31.0-55.3)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Toluene_BiomonitoringSummary.html

Urinary N-Acetyl-S-(1,2-dichlorovinyl)-L-cysteine (2011 – 2012)

Metabolite of Trichloroethene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	869
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	518
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	351
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	< LOD	525
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	344
Nonsmokers†							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	1318
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	659
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	659
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	< LOD	628
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 12.6.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/HalogenatedSolvents_BiomonitoringSummary.html

Urinary N-Acetyl-S-(1,2-dichlorovinyl)-L-cysteine (creatinine corrected) (2011 – 2012)

Metabolite of Trichloroethene

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	869
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	518
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	351
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	< LOD	525
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	344
Nonsmokers†							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	1317
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	658
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	659
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	< LOD	627
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
 < LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/HalogenatedSolvents_BiomonitoringSummary.html

Urinary N-Acetyl-S-(2,2-dichlorovinyl)-L-cysteine (2011 – 2012)

Metabolite of Trichloroethene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	869
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	518
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	351
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	< LOD	525
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	344
Nonsmokers†							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	1318
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	659
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	659
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	< LOD	628
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 6.5.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/HalogenatedSolvents_BiomonitoringSummary.html

Urinary N-Acetyl-S-(2,2-dichlorovinyl)-L-cysteine (creatinine corrected) (2011 – 2012)

Metabolite of Trichloroethene

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	869
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	518
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	351
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	< LOD	525
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	344
Nonsmokers†							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	1317
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	658
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	659
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	< LOD	627
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
 < LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/HalogenatedSolvents_BiomonitoringSummary.html

Urinary N-Acetyl-S-(dimethylphenyl)-L-cysteine (2011 – 2012)

Metabolite of Xylene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	869
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	518
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	351
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	< LOD	525
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	344
Nonsmokers†							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	1318
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	659
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	659
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	< LOD	628
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.5.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Xylenes_BiomonitoringSummary.html

Urinary N-Acetyl-S-(dimethylphenyl)-L-cysteine (creatinine corrected) (2011 – 2012)

Metabolite of Xylene

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	869
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	518
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	351
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	< LOD	525
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	344
Nonsmokers†							
Total	11-12	*	< LOD	< LOD	< LOD	< LOD	1317
Age group							
20-49 years	11-12	*	< LOD	< LOD	< LOD	< LOD	658
50 years and older	11-12	*	< LOD	< LOD	< LOD	< LOD	659
Gender							
Males	11-12	*	< LOD	< LOD	< LOD	< LOD	627
Females	11-12	*	< LOD	< LOD	< LOD	< LOD	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Xylenes_BiomonitoringSummary.html

Urinary 2-Methylhippuric acid (2011 – 2012)

Metabolite of Xylene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	97.5 (85.1-112)	105 (94.5-116)	180 (163-203)	276 (238-327)	396 (322-426)	869
Age group							
20-49 years	11-12	93.0 (79.0-110)	105 (92.6-113)	170 (155-192)	276 (232-304)	351 (276-434)	518
50 years and older	11-12	105 (87.1-126)	104 (84.6-140)	192 (168-216)	300 (235-398)	423 (348-477)	351
Gender							
Males	11-12	104 (83.4-131)	113 (95.7-148)	198 (168-232)	290 (243-396)	398 (300-475)	525
Females	11-12	89.3 (80.2-99.5)	94.6 (89.1-104)	160 (133-179)	242 (204-303)	353 (242-434)	344
Nonsmokers†							
Total	11-12	26.2 (23.2-29.5)	25.1 (21.4-27.9)	55.9 (48.6-64.4)	116 (95.0-144)	171 (135-227)	1318
Age group							
20-49 years	11-12	28.7 (24.6-33.5)	26.0 (21.9-31.5)	62.3 (49.3-74.9)	127 (95.2-158)	188 (134-251)	659
50 years and older	11-12	23.6 (20.1-27.8)	23.9 (18.4-28.5)	49.7 (39.4-62.3)	107 (77.8-148)	170 (118-224)	659
Gender							
Males	11-12	31.3 (24.4-40.1)	27.4 (20.9-34.9)	65.3 (43.5-88.9)	158 (90.2-206)	206 (129-408)	628
Females	11-12	22.7 (19.6-26.3)	22.7 (20.0-26.0)	51.1 (39.8-59.6)	99.8 (79.8-114)	138 (107-171)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 5.0.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Xylenes_BiomonitoringSummary.html

Urinary 2-Methylhippuric acid (creatinine corrected) (2011 – 2012)

Metabolite of Xylene

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	108 (97.3-119)	113 (98.8-130)	195 (175-214)	330 (255-376)	388 (338-459)	869
Age group							
20-49 years	11-12	96.9 (87.3-108)	94.8 (85.1-107)	189 (163-204)	324 (239-348)	378 (333-453)	518
50 years and older	11-12	127 (110-147)	137 (123-155)	206 (182-245)	332 (252-398)	423 (330-486)	351
Gender							
Males	11-12	98.9 (82.7-118)	99.3 (83.6-121)	171 (127-214)	303 (200-376)	376 (333-423)	525
Females	11-12	120 (98.4-146)	140 (104-166)	229 (187-270)	330 (270-398)	438 (330-495)	344
Nonsmokers†							
Total	11-12	30.7 (27.5-34.3)	29.0 (25.8-33.5)	60.6 (53.7-68.4)	123 (98.9-137)	168 (134-232)	1317
Age group							
20-49 years	11-12	31.6 (28.0-35.8)	30.0 (26.7-34.7)	60.6 (47.5-69.5)	100 (85.9-140)	173 (100-292)	658
50 years and older	11-12	29.8 (25.9-34.2)	28.0 (21.8-35.2)	60.8 (51.8-72.3)	133 (110-142)	162 (146-204)	659
Gender							
Males	11-12	28.0 (22.7-34.7)	26.8 (22.1-33.5)	56.3 (42.1-75.9)	100 (84.3-136)	159 (100-307)	627
Females	11-12	33.0 (29.6-36.8)	30.9 (26.7-36.6)	62.6 (55.1-69.5)	133 (109-140)	180 (146-207)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Xylenes_BiomonitoringSummary.html

Urinary 3-and 4-Methylhippuric acid (2011 – 2012)

Metabolite of Xylene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	676 (583-784)	730 (599-868)	1310 (1160-1560)	2170 (1970-2410)	2860 (2400-3580)	869
Age group							
20-49 years	11-12	629 (520-760)	730 (565-879)	1260 (1110-1410)	1940 (1700-2380)	2650 (2190-3010)	518
50 years and older	11-12	758 (640-898)	731 (590-1050)	1440 (1140-1970)	2420 (1940-3930)	3610 (2430-4490)	351
Gender							
Males	11-12	726 (576-915)	868 (599-1070)	1500 (1190-1810)	2290 (1900-2960)	3170 (2100-3940)	525
Females	11-12	619 (545-702)	649 (590-801)	1110 (994-1210)	1990 (1670-2400)	2430 (2060-2860)	344
Nonsmokers†							
Total	11-12	173 (158-189)	165 (143-192)	372 (313-462)	824 (701-979)	1370 (1040-1560)	1318
Age group							
20-49 years	11-12	172 (147-201)	159 (136-202)	376 (298-469)	844 (690-1040)	1330 (921-1630)	659
50 years and older	11-12	174 (151-200)	169 (134-208)	361 (291-506)	789 (609-1070)	1370 (1020-1590)	659
Gender							
Males	11-12	200 (162-247)	186 (143-227)	396 (293-615)	949 (690-1370)	1560 (1200-1660)	628
Females	11-12	154 (135-175)	150 (131-168)	353 (273-467)	730 (609-897)	1190 (895-1420)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)
Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 8.0.

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Xylenes_BiomonitoringSummary.html

Urinary 3-and 4-Methylhippuric acid (creatinine corrected) (2011 – 2012)

Metabolite of Xylene

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. adult population from the National Health and Nutrition Examination Survey by smoking status.

Categories	Survey years	Geometric mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample size
Cigarette Smokers							
Total	11-12	747 (672-831)	820 (772-870)	1320 (1150-1540)	2000 (1700-2220)	2260 (2060-2500)	869
Age group							
20-49 years	11-12	655 (582-737)	695 (607-822)	1190 (1080-1360)	2000 (1540-2110)	2220 (2050-2490)	518
50 years and older	11-12	916 (809-1040)	950 (831-1090)	1550 (1210-1700)	2050 (1700-2470)	2470 (1960-2890)	351
Gender							
Males	11-12	687 (573-825)	716 (584-902)	1120 (965-1380)	1770 (1400-2080)	2110 (1890-2380)	525
Females	11-12	830 (703-979)	971 (773-1160)	1600 (1300-1810)	2120 (1990-2290)	2500 (2080-3080)	344
Nonsmokers†							
Total	11-12	203 (189-217)	166 (149-186)	403 (342-463)	770 (723-853)	1060 (958-1210)	1317
Age group							
20-49 years	11-12	189 (169-210)	155 (139-184)	384 (310-447)	642 (540-767)	784 (721-1020)	658
50 years and older	11-12	219 (197-243)	169 (149-193)	460 (342-590)	966 (803-1060)	1300 (1030-1610)	659
Gender							
Males	11-12	179 (151-212)	147 (121-181)	342 (231-472)	647 (530-765)	867 (691-1140)	627
Females	11-12	224 (207-242)	182 (162-206)	447 (384-538)	858 (770-1030)	1290 (974-1470)	690

†Cigarette nonsmokers who used other tobacco products were excluded. See [Exposure to Chemicals Found in Cigarette Smoke in U.S. Adults: Select Chemicals in a Special Sample](#)

Biomonitoring Summary

http://www.cdc.gov/biomonitoring/Xylenes_BiomonitoringSummary.html

Appendix A. Procedure to Estimate Percentiles

Including percentiles whose estimate falls on a value that is repeated multiple times in the dataset

A common practice to calculate confidence intervals from survey data is to use large-sample normal approximations. Ninety-five percent confidence intervals on point estimates of percentiles are often computed by adding and subtracting from the point estimate a quantity equal to twice its standard error. This normal approximation method may not be adequate, however, when estimating the proportion of subjects above or below a selected value, especially when the proportion is near 0.0 or 1.0 or when the effective sample size is small. In addition, confidence intervals on proportions deviating from 0.5 are not theoretically expected to be symmetric around the point estimate. Further, adding and subtracting a multiple of the standard error to an estimate near 0.0 or 1.0 can lead to impossible confidence limits (i.e., proportion estimates below 0.0 or above 1.0). The approach used for the *Report* data tables (and for previous *Reports*) produces asymmetric confidence intervals consistent with skewed (nonnormal) biologic data distributions.

The method we use to estimate percentiles and their confidence limits for the *Report* data tables and for previous reports is adapted from a method proposed by Woodruff (1952) for percentile estimation and a method described by Korn and Graubard (1998) for estimating confidence intervals for proportions. This method essentially involves first obtaining an empirical point estimate of the desired percentile by creating a rank ordered listing of the sampled observations along with their sampling weights. From this listing and the sampling weights, it is possible to determine an empirical percentile estimate for the target population. After this point estimate of the percentile has been obtained, the fraction of results below the estimate is calculated. The fraction below the point estimate should be very close to the proportion corresponding to the desired percentile, but can deviate from this proportion depending on the frequency of non-unique sampled observations in the vicinity of the empirical percentile estimate and depending on the sampling weight associated with the sampled observation. For example, when measuring some compounds as part of NHANES there may be multiple results below a common limit of detection (LOD) or multiple results with identical measured values due to the reporting limitations of the instrument. This phenomenon coupled with the sampling weight assigned to each measured result and with the limitations of statistical software can lead to difficulties in accurately estimating some percentiles and their corresponding confidence limits because an exact percentile may fall within a large group of results with identical measured values. We circumvented this potential problem for the *Report* data tables by adding a unique, negligibly small number to each measured result. This small number was later subtracted from the percentile estimate without affecting the percentile estimate and without altering any of the original measured results.

By adding a unique, negligibly small number to each sampled observation, it was possible to associate a single sampled observation with the percentile estimate and thus to minimize the difference between the fraction below the point estimate and the proportion corresponding to the desired percentile. However, due to sample weighting, it is still possible to obtain a different point estimate (which will only differ by the difference between numerically adjacent analyte values) depending on how the data are sorted

before adding the unique number to each result. We circumvented this potential problem by replacing actual sample weights with an average sample weight where the average is computed across subjects in the same demographic domain who have identical measured results. We computed standard error estimates in a separate step using the original (unaltered) data. Clopper-Pearson 95% confidence intervals around the estimated proportion are obtained using the method described by Korn and Graubard (1998).

We describe below how SAS Proc Univariate and SUDAAN can be used to carry out this method of percentile and confidence interval estimation. SAS code for calculating these confidence intervals can be downloaded from <http://www.cdc.gov/exposurereport>. In the narrative that follows, the term 'demographic domain' refers to a demographic group of interest, for example non-Hispanic blacks. The term 'set of subsample weights' refers to the sampling weights that correspond to the variable for which percentiles will be estimated, for example the set of subsample weights associated with total blood mercury measurements. The term 'analyte' refers to the biological or chemical compound measured in a group of subjects and for which percentiles are to be estimated.

Procedure to calculate percentile estimates and their confidence intervals

Step 1: Obtain a percentile estimate using the original (unaltered data):

Create a separate file with original data (ORIG_DATA). Use SAS (SAS Institute Inc. 1999) Proc Univariate (with default percentile definition equivalent to option PCTLDEF = 5 and with the Freq option variable equal to the original subsample sampling weight) to obtain a point estimate of the percentile (PTLE_ORIG) of an analyte's original results for the demographic domain of interest, for example, the 95th percentile of total blood mercury results for adults aged 20+ years.

Step 2: Obtain a percentile estimate using the altered data:

Create a separate file for use with altered data (ALTR_DATA). Sort the data by analyte measured value separately for each particular demographic domain and set of subsample weights. Use SAS Proc Means to compute the average sampling weight (WT_{AVE}) for each unique measured result. For each unique measured result, use a counter from 1 to the total number of subjects with identical values to create a unique integer to associate with each measured observation. Each of these numbers should then be divided by 1,000,000,000 and added to the corresponding measured observation. This will result in each measured observation having an additional fractional amount beyond the fourth decimal as long as there are less than 10,000 subjects with the same measured result. Use SAS Proc Univariate (again with default percentile definition equivalent to option PCTLDEF = 5 but now with the Freq option variable equal to WT_{AVE}) to obtain a point estimate of the percentile (PTLE_ALTR) of an analyte's altered results for the demographic domain of interest.

Step 3:

Sort the data in the ORIG_DATA file by the stratum (sdmvstra) and primary sampling unit (sdmvpsu) variables. Use SUDAAN (SUDAAN Users Manual, 2001) Proc Descript with Taylor Linearization DESIGN = WR (i.e., sampling with replacement), with proper NEST statement, and with the original subsample sampling weight variable to estimate

the proportion (P_ORIG) of subjects with results below the percentile estimate (PTLE_ORIG) obtained in Step 1 and discard P_ORIG but retain the standard error (SEMEAN_ORIG) associated with PTLE_ORIG.

Step 4:

Sort the data in the ALTR_DATA file by the stratum (sdmvstra) and primary sampling unit (sdmvpstu) variables. Use SUDAAN (SUDAAN Users Manual, 2001) Proc Descript with Taylor Linearization DESIGN = WR (i.e., sampling with replacement), with proper NEST statement, and with the average sampling weight variable (WT_AVE) to estimate the proportion (P_ALTR) of subjects with results below the percentile estimate (PTLE_ALTR) obtained in Step 2 and keep P_ALTR but discard the standard error (SEMEAN_ALTR) associated with PTLE_ALTR. Compute the degrees-of-freedom adjusted effective sample size

$$(1) \quad n_{df} = ((t_{num}/t_{denom})^2)P_ALTR(1 - P_ALTR)/(SEMEAN_ORIG^2)$$

where t_{num} and t_{denom} are 0.975 critical values of the Student's t distribution with degrees of freedom equal to the actual sample size minus 1 and the number of primary sampling units (PSUs) minus the number of strata, respectively. Note: the degrees of freedom for t_{denom} can vary with the demographic domain of interest (e.g., males).

Step 5:

After obtaining an estimate of P_ALTR (i.e., the proportion obtained in Step 4), compute the Clopper-Pearson 95% confidence interval (PL(x,ndf), PU(x,ndf)) as follows:

$$(2) \quad PL(x,ndf) = v1Fv1,v2 (0.025)/(v2 + v1Fv1,v2(0.025))$$

&

$$PU(x,ndf) = v3Fv3,v4 (0.975)/(v4 + v3Fv3,v4(0.975))$$

where x is equal to P_ALTR times ndf, $v1 = 2x$, $v2 = 2(ndf - x + 1)$, $v3 = 2(x + 1)$, $v4 = 2(ndf - x)$, and $F_{d1,d2}(\beta)$ is the β quantile of an F distribution with $d1$ and $d2$ degrees of freedom. (Note: If ndf is greater than the actual sample size or if P_ALTR is equal to zero, then the actual sample size should be used in place of ndf.) This step will produce a lower and an upper limit for the estimated proportion obtained in Step 4.

Step 6:

Use SAS Proc Univariate (again with default percentile definition equivalent to option PCTLDEF = 5 and with the Freq option variable equal to WT_AVE) to determine the analyte values that correspond to the desired percentile (proportion) and to the lower and upper proportion limits obtained in Step 5. Round these results to 2 or 3 decimals depending on the significant figures associated with the original measured values.

Example:

To estimate the 95th percentile of total blood mercury in adults 20+ years of age in the 2013-2014 survey, create two separate files: name one ORIG_DATA and the other ALTR_DATA. For the ORIG_DATA file use SAS Proc Univariate with the Freq option and the subsample sampling weight (or in this case the full sample sampling weight because total blood mercury is the analyte of interest) to get a weighted point estimate of the analyte value that corresponds to the 95th percentile (PTLE_ORIG). For this example the value is 4.88 µg/L.

Sort the results in the ALTR_DATA file by analyte measured value. Use SAS Proc Means to compute the average sampling weight (WT_{AVE}) for each unique analyte measured value. For each unique measured result, use a counter from 1 to the total number of subjects with identical values to create a unique integer to associate with each measured observation. Divide each counter value by 1,000,000,000 and add this amount to the corresponding measured observation. For this altered data file (ALTR_DATA) use SAS Proc Univariate with the Freq option and WT_{AVE} to get a weighted point estimate of the analyte value that corresponds to the 95th percentile (PTLE_ALTR). For this example the value is also 4.88 µg/L.

For the ORIG_DATA file use SUDAAN to estimate the weighted proportion (P_{ORIG}) of subjects with results below the value of PTLE_ORIG (which can differ from 0.95 depending on the number of results with identical values; for this example the proportion is 0.9491) and the standard error (SEMEAN_ORIG) associated with P_{ORIG} (for this example SEMEAN_ORIG = 0.0044).

For the ALTR_DATA file use SUDAAN to estimate the weighted proportion of subjects (P_{ALTR}) with results below the value of PTLE_ALTR (which should also be very close to 0.95 regardless of the number of original results with identical values; for this example the proportion is also 0.9491). Then obtain a confidence interval on P_{ALTR} by computing the weighted Clopper-Pearson 95% confidence limits (equation 2 above) using the degrees-of-freedom adjusted effective sample size as described in equation 1 above. For this example the effective sample size is 2113.64 resulting in lower and upper confidence limits of 0.93885 and 0.95808, respectively. Then use SAS Proc Univariate (with the Freq option variable equal to WT_{AVE}) to determine the analyte values corresponding to the weighted 93.9th and 95.8th percentiles. These point estimates are the lower and upper confidence limits on the 95th percentile estimate. Round the 95th percentile estimate and its confidence limits to 2 or 3 decimals depending on the significant figures associated with the original measured values. For this example the rounded point estimate is 4.88 µg/L with lower and upper confidence limits of 4.36 and 5.21 µg/L, respectively.

Appendix C. Limit of Detection Table

The analytical limit of detection (LOD) for each of the different chemical measurements is presented in the table below. The LOD is the concentration at which the measurement has a 95% probability of being greater than zero (Taylor, 1987). As analytical methods improve, LODs will often change. For this reason, LOD results are reported by survey periods (e.g., 1999-2000, 2001-2002, etc.).

Reference: Taylor JK. Quality Assurance of Chemical Measurements. Chelsea (MI): Lewis Publishing. 1987.

Adducts of Hemoglobin

Chemical, in packed rbc's, pmol/g hemoglobin	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Acrylamide	--	--	3.0	0.11	--	--	--	--	--
Glycidamide	--	--	4.0	0.66	--	--	--	--	--

Tobacco Smoke

Chemical, matrix, units	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Cotinine in serum, ng/mL	0.05	0.05	0.015	0.015	0.015	0.015	0.015	0.015	--
Hydroxycotinine in serum, ng/mL	--	--	--	--	--	--	--	0.015	--
NNAL in urine, pg/mL	--	--	--	--	1	0.6	0.6	--	--

Disinfection By-Products

Chemical, in blood, pg/mL	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Bromodichloromethane	--	0.233	0.62	0.62	0.62	--	--	6.0	--
Dibromochloromethane	--	0.271	0.62	0.62	0.62	--	--	5.0	--
Tribromomethane (Bromoform)	--	0.596	1.5	1.0	1.0	--	--	5.0	--
Trichloromethane (Chloroform)	--	2.37	2.11	2.1	2.1	--	--	8.0	--

Personal Care and Consumer Product Chemicals and Metabolites

Chemical, in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Benzophenone-3	--	--	0.3	0.4	0.4	0.4	0.4	0.4	--
Bisphenol A	--	--	0.4	0.4	0.4	0.4	0.4	0.2	--
Bisphenol F	--	--	--	--	--	--	--	0.2	--

Chemical, in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Bisphenol S	--	--	--	--	--	--	--	0.1	--
4- <i>tert</i> -Octylphenol	--	--	--	0.2	0.2	0.2	--	--	--
Triclocarban	--	--	--	--	--	--	--	0.1	--
Triclosan	--	--	2.3	2.3	2.3	2.3	2.3	1.7	--
Butyl paraben	--	--	--	0.2	0.2	0.2	0.2	0.1	--
Ethyl paraben	--	--	--	1.0	1.0	1.0	1.0	1.0	--
Methyl paraben	--	--	--	1.0	1.0	1.0	1.0	1.0	--
<i>n</i> -Propyl paraben	--	--	--	0.2	0.2	0.2	0.2	0.1	--
2,4-Dichlorophenol	--	--	0.17	0.2	0.2	0.2	0.2	0.1	--
2,5-Dichlorophenol	--	--	0.12	0.2	0.2	0.2	0.2	0.1	--

Flame Retardant Metabolites

Chemical, in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Bis(1-chloro-2-propyl) phosphate (BCPP)	--	--	--	--	--	--	--	0.1	--
Bis(2-chloroethyl) phosphate (BCEP)	--	--	--	--	--	--	--	0.08	--
Bis(1,3-dichloro-2-propyl) phosphate (BDCPP)	--	--	--	--	--	--	--	0.11	--
Dibenzyl phosphate (DBzP)	--	--	--	--	--	--	--	0.05	--
Dibutyl phosphate (DBuP)	--	--	--	--	--	--	--	0.05	--
Di- <i>o</i> -cresylphosphate (DoCP)	--	--	--	--	--	--	--	0.05	--
Di- <i>p</i> -cresylphosphate (DpCP)	--	--	--	--	--	--	--	0.05	--
Diphenyl phosphate (DPhP)	--	--	--	--	--	--	--	0.16	--
2,3,4,5-Tetrabromobenzoic acid (TBBA)	--	--	--	--	--	--	--	0.05	--

Fungicides and Metabolites

Chemical, in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
<i>ortho</i> -Phenylphenol	--	--	0.1	0.1	0.1	0.2	--	--	--
Ethylene thiourea	--	--	0.1	0.24	0.21	--	--	--	--
Pentachlorophenol	--	--	0.5	--	--	--	--	--	--
Propylene thiourea	--	--	0.1	0.37	0.36	--	--	--	--

Herbicides and Metabolites

Chemical, in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Atrazine	--	--	--	--	0.5	--	--	--	--
Atrazine mercapturate	--	--	--	--	0.5	--	--	--	--
Desethyl atrazine	--	--	--	--	0.25	--	--	--	--
Desisopropyl atrazine	--	--	--	--	0.25	--	--	--	--
Desisopropyl atrazine mercapturate	--	--	--	--	0.1	--	--	--	--
Diaminochlorotriazine	--	--	--	--	0.5	--	--	--	--
2,4-Dichlorophenoxyacetic acid	0.952	0.2	0.1	--	0.4	0.15	--	--	--
2,4,5-Trichlorophenoxyacetic acid	1.2	0.1	0.1	--	0.10	0.1	--	--	--

Sulfonyl Urea Herbicides

Chemical in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Bensulfuron-methyl	--	--	0.05	0.05	0.05	--	--	--	--
Chlorsulfuron	--	--	0.06	0.06	0.06	--	--	--	--
Ethametsulfuron-methyl	--	--	0.1	0.1	0.1	--	--	--	--
Foramsulfuron	--	--	0.05	0.05	0.05	--	--	--	--
Halosulfuron	--	--	0.1	0.1	0.1	--	--	--	--
Mesosulfuron-methyl	--	--	0.06	0.06	0.06	--	--	--	--
Metsulfuron-methyl	--	--	0.05	0.05	0.05	--	--	--	--
Nicosulfuron	--	--	0.1	0.1	0.1	--	--	--	--
Oxasulfuron	--	--	0.06	0.06	0.06	--	--	--	--
Primisulfuron-methyl	--	--	0.07	0.07	0.07	--	--	--	--
Prosulfuron	--	--	0.05	0.05	0.05	--	--	--	--
Rimsulfuron	--	--	0.05	0.05	0.05	--	--	--	--
Sulfometuron-methyl	--	--	0.05	0.05	0.05	--	--	--	--
Sulfosulfuron	--	--	0.1	0.1	0.1	--	--	--	--
Thifensulfuron-methyl	--	--	0.08	0.08	0.08	--	--	--	--
Triasulfuron	--	--	0.07	0.07	0.07	--	--	--	--
Triflurosulfuron-methyl	--	--	0.05	0.05	0.05	--	--	--	--

Insect Repellent and Metabolites

Chemical, in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
N,N-Diethyl- <i>meta</i> -toluamide (DEET)	--	--	--	--	0.083	0.083	0.083	0.083	--
3-(Diethylcarbamoyl) benzoic acid (DCBA)	--	--	--	--	0.93	0.475	0.475	0.475	--
N,N-Diethyl-3-(hydroxymethyl) benzamide (DHMB)	--	--	--	--	0.089	0.089	0.089	0.089	--

Carbamate Pesticide Metabolites

Chemical, in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Carbofuranphenol	0.4	0.4	0.4	--	--	--	--	--	--
2-isopropoxyphenol	1.1	0.4	0.4	--	--	--	--	--	--

Organochlorine Pesticides and Metabolites

Chemical, in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
2,4,5-Trichlorophenol	--	--	0.1	0.1	0.1	0.1	--	--	--
2,4,6-Trichlorophenol	--	--	0.5	0.5	0.5	0.5	--	--	--

Organophosphorus Insecticides: Specific Metabolites

Chemical, in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Acephate	--	--	0.1	0.25	0.27	--	--	--	--
Dimethoate	--	--	0.1	0.25	0.1	--	--	--	--
Methamidophos	--	--	0.1	0.37	0.41	--	--	--	--
Omethoate	--	--	0.1	0.14	0.1	--	--	--	--
Malathion dicarboxylic acid	2.64	--	--	--	0.5	0.5	--	--	--
2-Isopropyl-4-methyl-pyrimidinol	7.2	0.7	--	--	0.1	0.1	--	--	--
<i>para</i> -Nitrophenol	0.8	0.1	--	--	0.1	0.1	--	--	--
3,5,6-Trichloro-2-pyridinol	0.4	0.4	--	--	0.1	0.1	--	--	--

Organophosphorus Insecticides: Dialkyl Phosphate Metabolites

Chemical, in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Diethylphosphate (DEP)	0.2	0.2	0.1	0.37	0.37	--	--	--	--

Chemical, in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Dimethylphosphate (DMP)	0.58	0.5	0.5	0.47	0.47	--	--	--	--
Diethylthiophosphate (DETP)	0.09	0.1	0.2	0.56	0.56	--	--	--	--
Dimethylthiophosphate (DMTP)	0.18	0.4	0.5	0.55	0.55	--	--	--	--
Diethylthiophosphate (DEDTP)	0.05	0.1	0.1	0.39	0.39	--	--	--	--
Dimethylthiophosphate (DMDTP)	0.08	0.1	0.1	0.51	0.51	--	--	--	--

Pyrethroid Insecticide Metabolites

Chemical, in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
<i>trans</i> -3-(2,2-Dichlorovinyl)-2,2-dimethylcyclopropane carboxylic acid	0.1	0.1	--	--	0.6	0.6	--	--	--
<i>cis</i> -3-(2,2-Dibromovinyl)-2,2-dimethylcyclopropane carboxylic acid	0.1	0.1	--	--	0.5	0.5	--	--	--
4-Fluoro-3-phenoxy-benzoic acid	0.2	0.2	--	--	0.1	0.1	--	--	--
3-Phenoxybenzoic acid	0.1	0.1	--	--	0.1	0.1	--	--	--

Metals and Metalloids

Chemical, matrix, units	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Antimony in urine, µg/L	0.04	0.04	0.07	0.032	0.032	0.032	0.041	0.022	--
Arsenic, Total in urine, µg/L	--	--	0.74	0.74	0.74	0.74	1.25	0.26	--
Arsenic (V) Acid in urine, µg As/L	--	--	1	1	1	1	0.87	0.79	--
Arsenobetaine in urine, µg As/L	--	--	0.4	0.4	0.4	0.4	1.19	1.16	--
Arsenocholine in urine, µg As/L	--	--	0.6	0.6	0.6	0.6	0.28	0.11	--
Arsenous (III) Acid in urine, µg As/L	--	--	1.2	1.2	1.2	1.2	0.48	0.12	--
Dimethylarsinic Acid in urine, µg As/L	--	--	1.7	1.7	1.7	1.7	1.8	1.91	--
Monomethylarsonic Acid in urine, µg As/L	--	--	0.9	0.9	0.9	0.9	0.89	0.2	--
Inorganic-related Arsenic Species, in urine, µg As/g	--	--	--	--	--	--	4.04	3.02	--
Trimethylarsine oxide in urine, µg As/L	--	--	1	1	1	1	0.25	--	--
Barium in urine, µg/L	0.12	0.12	0.31	0.12	0.12	0.12	0.1	0.06	--
Beryllium in urine, µg/L	0.13	0.13	0.13	0.072	0.072	0.072	--	--	--
Cadmium in blood, µg/L	0.3	0.3	0.14	0.2	0.2	0.2	0.16	0.1	0.1
Cadmium in urine, µg/L	0.06	0.06	0.06	0.042	0.042	0.042	0.056	0.036	--

Chemical, matrix, units	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Cesium in urine, µg/L	0.14	0.14	0.2	0.066	0.066	0.066	0.12	0.086	--
Chromium in blood, µg/L	--	--	--	--	--	--	--	--	0.41
Cobalt in blood, µg/L	--	--	--	--	--	--	--	--	0.6
Cobalt in urine, µg/L	0.07	0.07	0.08	0.041	0.041	0.041	0.048	0.023	--
Copper in serum, µg/dL	--	--	--	--	--	--	2.5	2.5	--
Lead in blood, µg/dL	0.3	0.3	0.28	0.25	0.25	0.25	0.25	0.07	0.07
Lead in urine, µg/L	0.1	0.1	0.33	0.1	0.1	0.1	0.08	0.03	--
Manganese in blood, µg/L	--	--	--	--	--	--	1.06	0.99	0.99
Manganese in urine, µg/L	--	--	--	--	--	--	0.08	0.13	--
Mercury, Total in blood, µg/L	--	--	0.2	0.33	0.33	0.33	0.16	0.28	0.28
Mercury, Inorganic in blood, µg/L	--	--	0.42	0.4	0.35	0.35	0.27	0.27	--
Mercury, Ethyl in blood, µg/L	--	--	--	--	--	--	0.16	0.16	--
Mercury, Methyl in blood, µg/L	--	--	--	--	--	--	0.12	0.12	--
Mercury in urine, µg/L	--	--	0.14	0.11	0.08	0.08	0.05	0.13	--
Molybdenum in urine, µg/L	0.8	0.8	1.5	0.92	0.92	0.92	0.99	0.8	--
Platinum in urine, µg/L	0.04	0.04	0.07	0.009	0.009	0.009	--	--	--
Selenium in blood, µg/L	--	--	--	--	--	--	30	24.5	24.5
Selenium in serum, µg/L	--	--	--	--	--	--	4.5	4.5	--
Strontium in urine, µg/L	--	--	--	--	--	--	2.5	2.34	--
Thallium in urine, µg/L	0.02	0.02	0.02	0.015	0.015	0.015	0.02	0.018	--
Tin in urine, µg/L	--	--	--	--	--	--	0.22	0.09	--
Tungsten in urine, µg/L	0.04	0.04	0.04	0.021	0.021	0.021	0.026	0.018	--
Uranium in urine, µg/L	0.004	0.004	0.005	0.002	0.002	0.0017	0.0033	0.002	--
Zinc in serum, µg/dL	--	--	--	--	--	--	2.9	2.9	--

Perchlorate and Other Anions in urine

Chemical, matrix, units	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Nitrate, mg/L	--	0.7	--	0.7	0.7	0.7	0.7	0.7	--
Perchlorate, µg/L	--	0.05	0.05	0.05	0.05	0.05	0.05	0.05	--

Chemical, matrix, units	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Thiocyanate, mg/L	--	0.02	--	0.02	0.02	0.02	0.02	0.02	--

Perfluoroalkyl and Polyfluoroalkyl Substances: Surfactants

Chemical, in serum, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Perfluorobutane sulfonic acid (PFBS)	--	--	0.4	0.1	0.1	0.1	0.1	0.1	--
Perfluorodecanoic acid (PFDA)	0.2	--	0.3	0.2	0.2	0.1	0.1	0.1	--
Perfluorododecanoic acid (PFDoA)	0.2	--	1	0.2	0.2	0.1	0.1	0.1	--
Perfluorheptanoic acid (PFHpA)	0.4	--	0.3	0.4	0.4	0.1	0.1	0.1	--
Perfluorohexane sulfonic acid (PFHxS)	0.1	--	0.3	0.1	0.1	0.1	0.1	0.1	--
Perfluorononanoic acid (PFNA)	0.1	--	0.1	0.1	0.082	0.082	0.082	0.1	--
Perfluorooctanoic acid (PFOA)	0.1	--	0.2	0.1	0.1	0.1	0.1	--	--
n-Perfluorooctanoic acid (n-PFOA)	--	--	--	--	--	--	--	0.1	--
Branched Perfluorooctanoic acid isomers (Sb-PFOA)	--	--	--	--	--	--	--	0.1	--
Perfluorooctane sulfonic acid (PFOS)	0.2	--	0.4	0.2	0.2	0.2	0.2	--	--
n-Perfluorooctane sulfonic acid (n-PFOS)	--	--	--	--	--	--	--	0.1	--
Perfluoromethylheptane sulfonic acid isomers (Sm-PFOS)	--	--	--	--	--	--	--	0.1	--
Perfluorooctane sulfonamide (PFOSA or FOSA)	0.05	--	0.1	0.1	0.1	0.1	0.1	0.1	--
2-(N-Ethyl-perfluorooctane sulfonamido) acetic acid (EtFOSAA)	0.2	--	0.4	0.2	0.2	0.1	0.1	0.1	--
2-(N-Methyl-perfluorooctane sulfonamido) acetic acid (MeFOSAA)	0.174	--	0.523	0.174	0.174	0.087	0.087	0.1	--
Perfluoroundecanoic acid (PFUnDA)	0.2	--	0.3	0.2	0.2	0.1	0.1	0.1	--

Phthalate and Phthalate Alternatives Metabolites

Chemical, in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Mono-benzyl phthalate (MBzP)	0.576	0.216	0.072	0.216	0.216	0.216	0.3	0.3	--
Mono-3-hydroxybutyl phthalate (MHBP)	--	--	--	--	--	--	--	0.4	--
Mono-n-butyl phthalate (MnBP)	0.9	1.1	0.4	0.6	0.6	0.4	0.4	0.4	--
Mono-isobutyl phthalate (MIBP)	--	1	0.3	0.3	0.3	0.2	0.2	0.8	--
Mono-2-methyl-2-hydroxypropyl phthalate (MHHP)	--	--	--	--	--	--	--	0.4	--
Mono-cyclohexyl phthalate (MCHP)	1.81	0.603	0.402	0.603	0.603	0.402	--	--	--

Chemical, in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Mono-ethyl phthalate (MEP)	0.792	0.594	0.264	0.528	0.462	0.396	0.6	1.2	--
Mono-2-ethylhexyl phthalate (MEHP)	1.2	1	0.9	1.2	1.1	0.5	0.5	0.8	--
Mono-(2-ethyl-5-hydroxyhexyl) phthalate (MEHHP)	--	1	0.3	0.7	0.7	0.2	0.2	0.4	--
Mono-(2-ethyl-5-oxohexyl) phthalate (MEOHP)	--	1.1	0.5	0.7	0.6	0.2	0.2	0.2	--
Mono-(2-ethyl-5-carboxypentyl) phthalate (MECPP)	--	--	0.3	0.6	0.5	0.2	0.2	0.4	--
Mono-(carboxynonyl) phthalate (MCNP)	--	--	--	0.6	0.5	0.2	0.2	0.2	--
Mono-isononyl phthalate (MiNP)	1.23	1.23	1.54	1.23	1.23	0.77	0.6	0.9	--
Mono-(carboxyoctyl) phthalate (MCOP)	--	--	--	0.7	0.7	0.2	0.2	0.3	--
Mono-methyl phthalate (MMP)	--	0.2	1	1.1	1.1	0.5	0.5	--	--
Mono-(3-carboxypropyl) phthalate (MCPP)	--	0.4	0.2	0.2	0.2	0.2	0.2	0.4	--
Mono- <i>n</i> -octyl phthalate (MOP)	1.51	1.68	1.68	1.85	1.85	0.84	--	--	--
Cyclohexane-1,2-dicarboxylic-mono(hydroxy-isononyl) ester (MHNCH)	--	--	--	--	--	--	0.4	0.4	--

Phytoestrogens and Metabolites

Chemical, in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Daidzein	0.5	1.6	0.3	0.4	0.4	0.4	--	--	--
Enterodiol	0.8	1.5	0.3	0.04	0.04	0.04	--	--	--
Enterolactone	0.6	1.9	0.3	0.1	0.1	0.1	--	--	--
Equol	3	3.3	0.3	0.06	0.06	0.6	--	--	--
Genistein	0.3	0.8	0.3	1	0.2	0.2	--	--	--
O-Desmethylangolensin	0.2	0.4	0.2	0.2	0.2	0.2	--	--	--

Polycyclic Aromatic Hydrocarbon Metabolites in urine

Chemical, units	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
2-Hydroxyfluorene ng/L	--	--	5.0	5.0	5.0	10.0	10.0	8.0	--
3-Hydroxyfluorene ng/L	--	2.0	5.0	5.0	5.0	10.0	10.0	8.0	--
9-Hydroxyfluorene ng/L	--	--	5.0	5.0	5.0	10.0	10.0	--	--
1-Hydroxyphenanthrene ng/L	--	3.5	5.0	5.0	5.0	10.0	10.0	9.0	--
2-Hydroxyphenanthrene ng/L	--	3.2	5.0	5.0	5.0	10.0	10.0	--	--

Chemical, units	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
3-Hydroxyphenanthrene ng/L	--	3.6	5.0	5.0	5.0	10.0	10.0	--	--
2- & 3-Hydroxyphenanthrene ng/L	--	--	--	--	--	--	--	10.0	--
4-Hydroxyphenanthrene ng/L	--	--	5.0	5.0	--	--	--	--	--
1-Hydroxypyrene ng/L	--	--	5.0	5.0	5.0	10.0	10.0	70.0	--
1-Hydroxynaphthalene (1-Naphthol), µg/L	--	--	0.047	0.048	0.045	0.044	0.044	0.06	--
2-Hydroxynaphthalene (2-Naphthol), µg/L	--	0.002	0.031	0.013	0.042	0.042	0.042	0.09	--

Heterocyclic Amines

Chemical, in urine, ng/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
3-Amino-1,4-dimethyl-5H-pyrido[4,3-b]indole (Trp-P-1)	--	--	--	--	--	--	--	0.79	--
2-Amino-3-methyl-9H-pyrido[2,3-b]indole (MeA-α-C)	--	--	--	--	--	--	--	0.33	--
2-Amino-1-methyl-6-phenylimidazo[4,5-b]pyridine (Ph1P)	--	--	--	--	--	--	--	0.34	--
2-Amino-9H-pyrido[2,3-b]indole (A-α-C)	--	--	--	--	--	--	--	0.62	--
2-Amino-3-methylimidazo[4,5-f]quinoline (IQ)	--	--	--	--	--	--	--	0.37	--
2-Amino-6-methyldipyrido[1,2-a:3',2'-d]imidazole (Glu-P1)	--	--	--	--	--	--	--	0.31	--
2-Aminodipyrido[1,2-a:3',2'-d]imidazole (GLU-P2)	--	--	--	--	--	--	--	0.83	--
Harman	--	--	--	--	--	--	--	4.59	--
1-Methyl-3-amino-5H-pyrido[4,3-b]indole (Trp-P-2)	--	--	--	--	--	--	--	0.63	--
Norharman	--	--	--	--	--	--	--	12.6	--

Volatile Organic Compounds (VOCs)

Chemical, in whole blood, ng/mL except as noted	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
1,1,1-Trichloroethane (Methyl chloroform)	--	--	0.048	0.01	0.01	0.01	0.01	0.01	--
1,1,1,2-Tetrachloroethane	--	--	--	--	0.04	0.04	0.04	0.04	--
1,1,2,2-Tetrachloroethane	--	--	0.05	0.01	0.01	0.01	0.01	--	--
1,1,2-Trichloroethane	--	--	0.01	0.01	0.01	0.01	0.01	--	--
1,2,3-Trichloropropane	--	--	--	--	0.04	--	--	0.04	--
1,1-Dichloroethane	--	--	0.01	0.01	0.01	0.01	0.01	--	--
1,1-Dichloroethene (Vinylidene chloride)	--	--	0.009	0.009	0.009	0.009	0.009	--	--

Chemical, in whole blood, ng/mL except as noted	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
1,2-Dibromo-3-chloropropane (DBCP)	--	--	0.1	0.1	0.1	0.1	--	--	--
1,2-Dibromoethane	--	--	--	--	0.015	0.015	0.015	0.015	--
1,2-Dichlorobenzene (o-Dichlorobenzene)	--	--	0.1	0.1	0.025	0.025	0.025	0.025	--
1,2-Dichloroethane (Ethylene dichloride)	--	--	0.01	0.01	0.01	0.01	0.01	0.01	--
cis-1,2-Dichloroethene	--	--	0.01	0.01	0.01	0.01	0.01	--	--
trans-1,2-Dichloroethene	--	--	0.01	0.01	0.01	0.01	0.01	--	--
1,2-Dichloropropane	--	--	0.008	0.008	0.01	0.01	0.01	--	--
1,3-Dichlorobenzene	--	--	0.05	0.05	0.025	0.025	0.025	0.025	--
1,4-Dichlorobenzene (Paradichlorobenzene)	--	0.12	0.12	0.011	0.04	0.04	0.04	0.04	--
1,4-Dioxane	--	--	--	--	--	0.5	0.5	0.5	--
2,5-Dimethylfuran	--	--	0.012	0.011	0.011	0.011	0.011	0.011	--
Benzene	--	0.024	0.024	0.024	0.024	0.024	0.024	0.024	--
Chlorobenzene	--	--	0.011	0.011	0.011	0.011	0.011	0.011	--
Chloroethane	--	--	--	--	--	--	--	0.45	--
Cyclohexane	--	--	--	--	--	--	--	0.02	--
Dibromomethane	--	--	0.03	0.03	0.03	0.03	0.03	--	--
Dichloromethane (Methylene chloride)	--	--	0.07	0.25	0.25	0.25	0.25	0.25	--
Diethyl ether	--	--	--	--	--	--	--	0.04	--
Ethyl acetate	--	--	--	--	--	--	--	0.158	--
Ethylbenzene	--	0.024	0.024	0.024	0.024	0.024	0.024	0.024	--
Furan	--	--	--	--	0.025	0.025	0.025	0.025	--
Heptane	--	--	--	--	--	--	--	0.1	--
Hexane	--	--	--	--	--	--	--	0.122	--
Hexachloroethane	--	--	0.011	0.011	0.011	0.011	0.011	--	--
Isopropylbenzene (Cumene)	--	--	--	--	0.04	0.04	0.04	0.04	--
Methylcyclopentane	--	--	--	--	--	--	--	0.02	--
Methyl-tert-butyl ether (MTBE), pg/mL	--	0.232	2.0	1.4	1.4	--	--	0.01ng/mL	--
Nitrobenzene	--	--	0.3	0.3	0.32	0.32	0.32	0.32	--

Chemical, in whole blood, ng/mL except as noted	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Nitromethane, pg/mL	--	--	--	--	0.32	--	--	--	--
Octane	--	--	--	--	--	--	--	0.1	--
Styrene	--	0.03	0.03	0.03	0.03	0.03	--	--	--
Tetrachloroethene (Perchloroethylene)	--	0.048	0.048	0.048	0.048	0.048	0.048	0.048	--
Tetrachloromethane (Carbon tetrachloride)	--	0.01	0.005	0.005	0.005	0.005	0.005	0.005	--
Tetrahydrofuran	--	--	--	--	--	--	--	0.125	--
Toluene	--	0.025	0.025	0.025	0.025	0.025	NR	0.025	--
Trichloroethene (Trichloroethylene)	--	0.012	0.012	0.012	0.012	0.012	0.012	0.012	--
ααα-Trifluorotoluene	--	--	--	--	--	--	--	0.04	--
Vinyl bromide	--	--	--	--	--	--	--	0.045	--
m-p-Xylene	--	0.34	0.034	0.034	0.034	0.034	0.034	0.034	--
o-Xylene	--	0.049	0.049	0.024	0.024	0.024	0.024	0.024	--

Volatile Organic Compound (VOC) Metabolites

Chemical, in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
N-Acetyl-S-(2-carboxyethyl)-L-cysteine	--	--	--	6.96	--	--	6.96	--	--
N-Acetyl-S-(3-hydroxypropyl)-L-cysteine	--	--	--	13	--	--	13	--	--
N-Acetyl-S-(2-carbamoyl-ethyl)-L-cysteine	--	--	--	2.2	--	--	2.2	--	--
N-Acetyl-S-(2-carbamoyl-2-hydroxyethyl)-L-cysteine	--	--	--	9.4	--	--	9.4	--	--
N-Acetyl-S-(2-cyanoethyl)-L-cysteine	--	--	--	0.5	--	--	0.5	--	--
N-Acetyl-S-(2-hydroxyethyl)-L-cysteine	--	--	--	0.791	--	--	0.791	--	--
N-Acetyl-S-(phenyl)-L-cysteine	--	--	--	0.6	--	--	0.6	--	--
N-Acetyl-S-(n-propyl)-L-cysteine	--	--	--	1.2	--	--	1.2	--	--
N-Acetyl-S-(3,4-dihydroxybutyl)-L-cysteine	--	--	--	5.25	--	--	5.25	--	--
N-Acetyl-S-(1-hydroxymethyl-2-propenyl)-L-cysteine	--	--	--	0.7	--	--	0.7	--	--
N-Acetyl-S-(2-hydroxy-3-butenyl)-L-cysteine	--	--	--	0.7	--	--	0.7	--	--
N-Acetyl-S-(4-hydroxy-2-butenyl)-L-cysteine	--	--	--	0.6	--	--	0.6	--	--
2-Thiothiazolidine-4-carboxylic acid	--	--	--	11.2	--	--	11.2	--	--
N-Acetyl-S-(3-hydroxypropyl-1-methyl)-L-cysteine	--	--	--	2.0	--	--	2.0	--	--

Chemical, in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
2-Aminothiazoline-4-carboxylic acid	--	--	--	15.0	--	--	15.0	--	--
N-Acetyl-S-(N-methylcarbamoyl)-L-cysteine	--	--	--	6.26	--	--	6.26	--	--
Phenylglyoxylic acid	--	--	--	12.0	--	--	12.0	--	--
N-Acetyl-S-(2-hydroxypropyl)-L-cysteine	--	--	--	5.3	--	--	5.3	--	--
N-Acetyl-S-(phenyl-2-hydroxyethyl)-L-cysteine	--	--	--	0.7	--	--	0.7	--	--
Mandelic acid	--	--	--	12.0	--	--	12.0	--	--
N-Acetyl-S-(trichlorovinyl)-L-cysteine	--	--	--	3.0	--	--	3.0	--	--
N-Acetyl-S-(benzyl)-L-cysteine	--	--	--	0.5	--	--	0.5	--	--
N-Acetyl-S-(1,2-dichlorovinyl)-L-cysteine	--	--	--	12.6	--	--	12.6	--	--
N-Acetyl-S-(2,2-dichlorovinyl)-L-cysteine	--	--	--	4.7	--	--	4.7	--	--
N-Acetyl-S-(dimethylphenyl)-L-cysteine	--	--	--	0.5	--	--	0.5	--	--
2-Methylhippuric acid	--	--	--	5.0	--	--	5.0	--	--
3- & 4-Methylhippuric acid	--	--	--	8.0	--	--	8.0	--	--

Organochlorine Pesticides and Metabolites (Pooled Samples after 2004)

Chemical, in serum, ng/g lipid	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Aldrin	--	5.94	7.8	--	--	--	--	--	--
Dieldrin	--	10.5	7.8	--	--	--	--	--	--
Endrin	--	5.09	7.8	--	--	--	--	--	--
Heptachlor epoxide	--	10.5	7.8	--	--	--	--	--	--
Oxychlorane	14.5	10.5	7.8	1.46	1.4	14.14	--	--	--
trans-Nonachlor	14.5	10.5	7.8	0.77	1.4	2.19	--	--	--
p,p'-DDT	20.7	17.4	7.8	1.46	1.4	2.19	--	--	--
p,p'-DDE	18.6	8.3	7.8	4.02	1.4	3.68	--	--	--
o,p'-DDT	--	17.4	7.8	--	--	--	--	--	--
Hexachlorobenzene	118	31.4	7.8	4.17	1.4	3.11	--	--	--
beta-Hexachlorocyclohexane	9.36	6.76	7.8	1.46	1.4	2.19	--	--	--
gamma-Hexachlorocyclohexane	14.5	10.5	7.8	1.46	1.4	2.19	--	--	--
Mirex	14.6	10.5	7.8	1.46	1.4	2.19	--	--	--

Polybrominated Diphenyl Ethers and PBB 153 (Pooled Samples after 2004)

Chemical, in serum, ng/g lipid	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
2,2',4'-Tribromodiphenyl ether (BDE 17)	--	--	1.0	0.6	0.6	0.59	--	--	--
2,4,4'-Tribromodiphenyl ether (BDE 28)	--	--	0.8	0.6	0.6	0.66	--	--	--
2,2',4,4'-Tetrabromodiphenyl ether (BDE 47)	--	--	4.2	1.6	0.6	0.64	--	--	--
2,3',4,4'-Tetrabromodiphenyl ether (BDE 66)	--	--	1.0	0.6	0.6	0.44	--	--	--
2,2',3,4,4'-Pentabromodiphenyl ether (BDE 85)	--	--	2.4	0.6	0.6	0.44	--	--	--
2,2',4,4',5-Pentabromodiphenyl ether (BDE 99)	--	--	5.0	1.2	0.6	0.56	--	--	--
2,2',4,4',6-Pentabromodiphenyl ether (BDE 100)	--	--	1.4	0.6	0.6	0.44	--	--	--
2,2',4,4',5,5'-Hexabromodiphenyl ether (BDE 153)	--	--	2.2	0.6	0.6	0.6	--	--	--
2,2',4,4',5,6'-Hexabromodiphenyl ether (BDE 154)	--	--	0.8	0.6	0.6	0.58	--	--	--
2,2',3,4,4',5',6-Heptabromodiphenyl ether (BDE 183)	--	--	1.7	0.6	0.6	0.49	--	--	--
2,2',3,3',4,4',5,5',6,6'-Decabromodiphenyl ether (BDE 209)	--	--	--	6	5.8	2.19	--	--	--
2,2',4,4',5,5'-Hexabromobiphenyl (PBB 153)	--	--	0.8	0.6	0.6	0.92	--	--	--

Polychlorinated Dibenzo-p-dioxins (Pooled Samples)

Chemical, in serum, pg/g lipid	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	55.9	10.3	13.0	2.4	4.22	4.5	--	--	--
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	9.0	11.9	0.2	0.26	0.28	--	--	--
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	20.1	9.1	12.3	0.1	0.2	0.22	--	--	--
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	20.3	9.3	12.3	0.1	0.13	0.14	--	--	--
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	329.0	319.0	218.0	13.0	22.6	24	--	--	--
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	14.2	6.0	4.5	0.6	1.08	1.1	--	--	--
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	12.1	5.8	3.8	0.4	0.74	0.78	--	--	--

Polychlorinated Dibenzofurans (Pooled Samples after 2004)

Chemical, in serum, pg/g lipid	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	13.5	7.0	8.6	1.03	1.78	1.9	--	--	--
1,2,3,4,7,8-Heptachlorodibenzofuran (HpCDF)	--	7.0	8.6	0.19	0.33	0.35	--	--	--
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	12.7	6.5	7.4	0.3	0.51	0.55	--	--	--

Chemical, in serum, pg/g lipid	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	12.6	6.1	7.9	0.1	0.18	0.19	--	--	--
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	12.7	6.0	8.3	0.2	0.35	0.37	--	--	--
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	12.9	5.8	8.2	0.11	0.2	0.21	--	--	--
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	35.6	21.0	12.0	1.37	2.37	2.6	--	--	--
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	13.2	5.8	7.1	0.47	0.81	0.85	--	--	--
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	12.7	5.5	6.8	0.51	0.88	0.92	--	--	--
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11.9	5.2	6.0	0.26	0.45	0.48	--	--	--

Dioxin-like Polychlorinated Biphenyls: Coplanar PCBs (Pooled Samples after 2004)

Chemical, in serum, pg/g lipid	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
3,4,4',5-Tetrachlorobiphenyl (PCB 81)	68.4	26.8	13.1	1.86	3.23	3.5	--	--	--
3,3',4,4',5-Pentachlorobiphenyl (PCB 126)	23.2	10.8	13.9	1.32	2.29	2.5	--	--	--
3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169)	27.0	11.0	15.9	1.33	2.31	2.5	--	--	--

Dioxin-like Polychlorinated Biphenyls: mono-ortho-substituted PCBs (Pooled Samples after 2004)

Chemical, in serum, ng/g lipid	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	12.4	10.5	0.4	0.31	0.3	0.37	--	--	--
2,3,3',4,4'-Pentachlorobiphenyl (PCB 114)	--	--	--	0.31	0.3	0.44	--	--	--
2,3',4,4',5-Pentachlorobiphenyl (PCB 118)	12.5	10.5	0.6	0.72	0.3	0.44	--	--	--
2',3,4,4',5-Pentachlorobiphenyl (PCB 123)	--	--	--	0.31	0.3	--	--	--	--
2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156)	12.5	10.5	0.4	0.31	0.3	0.44	--	--	--
2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157)	12.5	10.5	0.4	0.31	0.3	0.44	--	--	--
2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167)	12.4	10.5	0.4	0.31	0.3	0.44	--	--	--
2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189)	--	10.5	0.4	0.31	0.3	0.44	--	--	--

Polychlorinated Biphenyls: Non-Dioxin-Like (Pooled Samples after 2004)

Chemical, in serum, ng/g lipid	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
2,4,4'-Trichlorobiphenyl (PCB 28)	32.4	--	1.7	2.54	0.7	0.92	--	--	--
2,2',3,5'-Tetrachloro biphenyl (PCB 44)	--	--	0.4	0.36	0.3	--	--	--	--

Chemical, in serum, ng/g lipid	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
2,2',4,5'-Tetrachloro biphenyl (PCB 49)	--	--	0.4	0.31	0.3	--	--	--	--
2,2',5,5'-Tetrachlorobiphenyl (PCB 52)	12.5	12.4	0.8	0.33	0.3	--	--	--	--
2,3',4,4'-Tetrachlorobiphenyl (PCB 66)	12.4	12.4	0.8	0.4	0.3	0.69	--	--	--
2,4,4',5'-Tetrachlorobiphenyl (PCB 74)	12.4	10.5	0.8	0.31	0.8	0.78	--	--	--
2,2',3,4,5'-Pentachlorobiphenyl (PCB 87)	--	10.5	0.4	0.31	0.3	--	--	--	--
2,2',4,4',5'-Pentachlorobiphenyl (PCB 99)	12.5	10.5	0.6	0.31	0.3	0.44	--	--	--
2,2',4,5,5'-Pentachlorobiphenyl (PCB 101)	25.7	10.5	0.6	0.59	0.3	--	--	--	--
2,3,3',4',6'-Pentachlorobiphenyl (PCB 110)	--	10.5	0.8	0.31	0.3	--	--	--	--
2,2',3,3',4,4'-Hexachlorobiphenyl (PCB 128)	12.4	10.5	0.4	0.31	0.3	--	--	--	--
2,2',3,3',4,4',5'-Hexachlorobiphenyl (PCB 138 & 158)	41.1	10.5	0.4	0.31	0.3	0.44	--	--	--
2,2',3,4',5,5'-Hexachlorobiphenyl (PCB 146)	12.4	10.5	0.4	0.31	0.3	0.44	--	--	--
2,2',3,4',5',6'-Hexachlorobiphenyl (PCB 149)	10.5	--	0.4	0.31	0.3	--	--	--	--
2,2',3,5,5',6'-Hexachlorobiphenyl (PCB 151)	--	10.5	0.4	0.31	0.3	--	--	--	--
2,2',4,4',5,5'-Hexachlorobiphenyl (PCB 153)	55.6	10.5	1.1	0.31	0.3	0.59	--	--	--
2,2',3,3',4,4',5'-Heptachlorobiphenyl (PCB 170)	17.2	10.5	0.4	0.31	0.3	0.44	--	--	--
2,2',3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 172)	12.5	10.5	0.4	0.31	0.3	--	--	--	--
2,2',3,3',4,4',5,6'-Heptachlorobiphenyl (PCB 177)	12.5	10.5	0.4	0.31	0.3	--	--	--	--
2,2',3,3',5,5',6'-Heptachlorobiphenyl (PCB 178)	12.4	10.5	0.4	0.31	0.3	0.44	--	--	--
2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB 180)	28.2	10.5	0.4	0.31	0.3	0.44	--	--	--
2,2',3,4,4',5',6'-Heptachlorobiphenyl (PCB 183)	12.4	10.5	0.4	0.31	0.3	0.44	--	--	--
2,2',3,4',5,5',6'-Heptachlorobiphenyl (PCB 187)	12.4	10.5	0.4	0.31	0.3	0.44	--	--	--
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (PCB 194)	--	10.5	0.4	0.31	0.3	0.44	--	--	--
2,2',3,3',4,4',5,6'-Octachlorobiphenyl (PCB 195)	--	28.1	0.7	0.31	0.3	--	--	--	--
2,2',3,3',4,4',5,6',6'-Octachlorobiphenyl (PCB 196 & 203)	--	10.5	0.4	0.31	0.3	0.44	--	--	--
2,2',3,3',4,4',5,5',6'-Octachlorobiphenyl (PCB 199)	--	10.5	0.4	0.31	0.3	0.44	--	--	--
2,2',3,3',4,4',5,5',6'-Nonachlorobiphenyl (PCB 206)	--	28.1	0.7	0.31	0.3	0.44	--	--	--
2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl (PCB 209)	--	--	0.7	0.31	0.3	0.44	--	--	--

Appendix D. References for Biomonitoring Analytical Methods

Adducts of Hemoglobin

Vesper HW, Bernert JT, Ospina M, Meyers T, Ingham L, Smith A, et al. Assessment of the relation between biomarkers for smoking and biomarkers for acrylamide exposure in humans. *Cancer Epidemiol Biomarkers Prev* 2007;16(11):2471-8.

Vesper HW, Slimani N, Hallmans G, Tjonneland A, Agudo A, Benetou V, et al. Cross-sectional study on acrylamide hemoglobin adducts in subpopulations from the European Prospective Investigation into Cancer and Nutrition (EPIC) study. *J Agric Food Chem* 2008; 56 (15):6046–53.

Tobacco Smoke

Cotinine

Bernert JT, McGuffey JE, Morrison MA, Pirkle JL. Comparison of serum and salivary cotinine measurements by a sensitive high-performance liquid chromatography/tandem mass spectrometry method as an indicator of exposure to tobacco smoke among smokers and nonsmokers. *J Anal Toxicol* 2000;24:333-9.

Bernert JT, Turner WE, Pirkle JL, Sosnoff CS, Akins JR, Waldrep MK, et al. Development and validation of sensitive method for determination of serum cotinine in smokers and nonsmokers by liquid chromatography/atmospheric pressure ionization tandem mass spectrometry. *Clin Chem* 1997;43:2281-91.

NNAL

Xia Y, Bernert JT. Stability of the tobacco-specific nitrosamine 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol (NNAL) in urine samples stored at various temperatures. *J Anal Toxicol* 2010;34:411-5.

Xia Y, McGuffey JE, Bhattacharyya S, Sellergren B, Yilmaz E, Wang L, et al. Analysis of the tobacco-specific nitrosamine 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol in urine by extraction on a molecularly imprinted polymer column and liquid chromatography/atmospheric pressure ionization tandem mass spectrometry. *Anal Chem*. 2005;77(23):7639-45.

Personal Care and Consumer Product Chemicals and Metabolites

Ye X, Kuklennyik Z, Needham LL, Calafat AM. Automated on-line column-switching HPLCMS/MS method with peak focusing for the determination of nine environmental phenols in urine. *Anal Chem* 2005;77:5407-13.

Ye X, Kuklennyik Z, Bishop AM, Needham LL, Calafat AM. Quantification of the urinary concentrations of parabens in humans by on-line solid phase extraction-high performance liquid chromatography isotope dilution tandem mass spectrometry. *J Chromatogr B* 2006;844:53-9.

Urinary Flame Retardants

Jayatilaka NK, Restrepo P, Williams L, Ospina M, Valentin-Blasini L, Calafat AM. Quantification of three chlorinated dialkyl phosphates, diphenyl phosphate, 2,3,4,5-tetrabromobenzoic acid, and four other organophosphates in human urine by solid phase extraction-high performance liquid chromatography-tandem mass spectrometry. *Anal Bioanal Chem.* (2017) 409:1323–1332.

Fungicides and Metabolites

Bravo R, Caltabiano LM, Fernandez C, Smith KD, Gallegos M, Whitehead RD, et al. Quantification of phenolic metabolites of environmental chemicals in human urine using gas chromatography-tandem mass spectrometry and isotope dilution quantification. *J Chromatogr B* 2005;820(2):229-236.

Hill RH Jr, Shealy DB, Head SL, Williams CC, Bailey SL, Gregg M, et al. Determination of pesticide metabolites in human urine using isotope dilution technique and tandem mass spectrometry. *J Anal Toxicol* 1995;19(5):323-329.

Montesano MA, Olsson AO, Kuklennyik P, Needham LL, Bradman AS, Barr DB. Method for determination of acephate, methamidophos, omethoate, dimethoate, ethylenethiourea and propylenethiourea in human urine using high-performance liquid chromatography-atmospheric pressure chemical ionization tandem mass spectrometry. *J Expo Sci Environ Epidemiol.* 2007;17(4):321-30.

Herbicides and Metabolites

Atrazine

Kuklennyik Z, Panuwet P, Jayatilaka NK, Pirkle JL, Calafat AM. Two-dimensional high performance liquid chromatography separation and tandem mass spectrometry detection of atrazine and its metabolic and hydrolysis products in urine. *J Chromatogr B Analyt Technol Biomed Life Sci.* 2012 Jul 15;901:1-8.

2,4-D and 2,4,5-T

Davis MD, Wade EL, Restrepo PR, Roman-Esteva W, Bravo R, Kuklennyik P, Calafat AM. Semiautomated solid phase extraction method for the mass spectrometric quantification of 12 specific metabolites of organophosphorus pesticides, synthetic pyrethroids, and select herbicides in human urine. *J Chromatogr B* 2013;929:18-26. (NHANES 2007-2008 and later)

Olsson AO, Baker SE, Nguyen JV, Romanoff LC, Udunka SO, Walker RD, et al. A liquid chromatography-tandem mass spectrometry multiresidue method for quantification of specific metabolites of organophosphorus pesticides, synthetic pyrethroids, selected herbicides, and DEET in human urine. *Anal Chem* 2004;76(9):2453-61. (NHANES 1999-2004)

Sulfonylurea Herbicides

Nguyen JV, Olsson AO, Bravo R, Needham LL, Barr DB. Quantification of atrazine, phenylurea, and sulfonylurea herbicide metabolites in urine by high-performance liquid chromatography-tandem mass spectrometry. *J Anal Toxicol*. 2007;31(4):181-6.

Baker SE, Olsson AO, Needham LL, Barr DB. High-performance liquid chromatography-tandem mass spectrometry method for quantifying sulfonylurea herbicides in human urine: reconsidering the validation process. *Anal Bioanal Chem* 2005; 383:963-76.

Insect Repellent and Metabolites (DEET)

Kuklenyik P, Baker SE, Bishop AM, Morales-A P, Calafat AM. On-line solid phase extraction-high performance liquid chromatography-isotope dilution-tandem mass spectrometry approach to quantify N,N-diethyl-*m*-toluamide and oxidative metabolites in urine. *Anal Chim Acta*. 2013 Jul 17;787:267-73.

Carbamate Insecticides

Bravo R, Caltabiano LM, Fernandez C, Smith KD, Gallegos M, Whitehead RD, et al. Quantification of phenolic metabolites of environmental chemicals in human urine using gas chromatography-tandem mass spectrometry and isotope dilution quantification. *J Chromatog B* 2005;820(2):229-236.

Hill RH Jr, Shealy DB, Head SL, Williams CC, Bailey SL, Gregg M, et al. Determination of pesticide metabolites in human urine using isotope dilution technique and tandem mass spectrometry. *J Anal Toxicol* 1995;19(5):323-329.

Organochlorine Pesticide Metabolites

Ye X, Kuklenyik Z, Needham LL, Calafat AM. Automated on-line column-switching HPLCMS/MS method with peak focusing for the determination of nine environmental phenols in urine. *Anal Chem* 2005;77:5407-13.

Organophosphate Insecticides: Specific Metabolites

Bravo R, Caltabiano LM, Fernandez C, Smith KD, Gallegos M, Whitehead RD, et al. Quantification of phenolic metabolites of environmental chemicals in human urine using gas chromatography-tandem mass spectrometry and isotope dilution quantification. *J Chromatog B* 2005;820(2):229-36.

Hill RH Jr, Shealy DB, Head SL, Williams CC, Bailey SL, Gregg M, et al. Determination of pesticide metabolites in human urine using isotope dilution technique and tandem mass spectrometry. *J Anal Toxicol* 1995;19(5):323-9.

Olsson AO, Baker SE, Nguyen JV, Romanoff LC, Udunka SO, Walker RD, et al. A liquid chromatography-tandem mass spectrometry multiresidue method for quantification of specific metabolites of organophosphorus pesticides, synthetic pyrethroids, selected herbicides, and DEET in human urine. *Anal Chem* 2004;76(9):2453-61.

Organophosphate Insecticides: Dialkyl Phosphate Metabolites

Bravo R, Caltabiano LM, Weerasekera G, Whitehead RD, Fernandez C, Needham LL, et al. Measurement of dialkyl phosphate metabolites of organophosphorus pesticides in human urine using lyophilization with gas chromatography-tandem mass spectrometry and isotope dilution quantification. *J Expo Anal Environ Epidemiol* 2004;14:249-259.

Bravo R, Driskell WJ, Whitehead RD Jr, Needham LL, Barr DB. Quantitation of dialkyl phosphate metabolites of organophosphate pesticides in human urine using GC-MS-MS with isotopic internal standards. *J Anal Toxicol* 2002;26:245-252.

Pyrethroids

Davis MD, Wade EL, Restrepo PR, Roman-Esteva W, Bravo R, Kuklenyik P, Calafat AM. Semiautomated solid phase extraction method for the mass spectrometric quantification of 12 specific metabolites of organophosphorus pesticides, synthetic pyrethroids, and select herbicides in human urine. *J Chromatogr B* 2013;929:18-26. (NHANES 2007-2008 and later)

Olsson AO, Baker SE, Nguyen JV, Romanoff LC, Udunka SO, Walker RD, et al. A liquid chromatography-tandem mass spectrometry multiresidue method for quantification of specific metabolites of organophosphorus pesticides, synthetic pyrethroids, selected herbicides, and DEET in human urine. *Anal Chem* 2004;76(9):2453-2461.

Metals and Metalloids

Caldwell KL, Hartel J, Jarrett J, Jones RL. Inductively coupled plasma mass spectrometry to measure multiple toxic elements in urine in NHANES 1999-2000. *Atomic Spectroscopy*. 2005;26(1):1-7.

Chen HP, Paschal DC, Miller DT, Morrow JC. Determination of total and inorganic mercury in whole blood by on-line digestion with flow injection. *Atomic Spectroscopy* 1998;19:176-179.

Jarrett JM, Jones RL, Caldwell KL, Verdon CP. Total urine arsenic measurements using inductively coupled plasma mass spectrometry with a dynamic reaction cell. *Atomic Spectroscopy* 2007;28(4):113-122.

Sommer YL, Verdon CP, Fresquez MR, Ward CD, Wood EB, Pan Y, et al. Measurement of mercury species in human blood using triple spike isotope dilution with SPME-GC-ICP-DRCMS. *Anal Bioanal Chem* 2014;406(20):5039-47.

Stoeppler M, Brandt K. Determination of cadmium in whole blood and urine by electrothermal atomic-absorption spectrophotometry. *Fresenius A Anal Chem* 1980;300:372-380.

Verdon CP, Caldwell KL, Fresques MR, Jones RL. Determination of seven arsenic compounds in urine by HPLC-ICP-DRC-MS: a CDC population biomonitoring method. *Anal Bioanal Chem* 2008;393(3):939-947.

Perchlorate and Other Anions

Valentin-Blasini L, Blount BC, Delinsky A. Quantification of iodide and sodium-iodide symporter inhibitors in human urine using ion chromatography tandem mass spectrometry. *J Chrom A* 2007;1155(1):40-46.

Valentin-Blasini L, Mauldin JP, Maple D and Blount BC. Analysis of perchlorate in human urine using ion chromatography and electrospray tandem mass spectrometry. *Anal Chem* 2005;77(8):2475-2481.

Perfluoroalkyl and Polyfluoroalkyl Substances: Surfactants

Kato K, Basden BJ, Needham LL, Calafat AM. Improved selectivity for the analysis of maternal serum and cord serum for polyfluoroalkyl chemicals. *J Chromatogr A* 2011;1218(15):2133-2137.

Kuklennyik Z, Needham LL, Calafat AM. Measurement of 18 perfluorinated organic acids and amides in human serum using on-line solid-phase extraction. *Anal Chem* 2005;77:6085-6091.

Kuklennyik Z, Reich JA, Tully JS, Needham LL, Calafat AM. Automated solid-phase extraction and measurement of perfluorinated organic acids and amides in human serum and milk. *Environ Sci Technol*. 2004 Jul 1;38(13):3698-704.

Phthalate and Phthalate Alternative Metabolites

Blount BC, Milgram KE, Silva M, Malek N, Reidy J, Needham LL, et al. Quantitative detection of eight phthalate metabolites in human urine using HPLC-APCI-MS/MS. *Anal Chem* 2000;72:4127-4134.

Kato K, Silva MJ, Needham LL, Calafat AM. Determination of 16 phthalate metabolites in urine using automated sample preparation and on-line preconcentration/high-performance liquid chromatography/tandem mass spectrometry. *Anal Chem* 2005;77(9):2985-91. (NHANES 2003- 2004)

Silva MJ, Jia T, Samandar E, Preau JL, Calafat AM. Environmental exposure to plasticizer 1,2- cyclohexane dicarboxylic acid, diisononyl ester (DINCH) in US adults (2000-2012). *Environ Res* 2013; 126: 159-163. (NHANES 2011-2014)

Silva MJ, Malek NA, Hodge CC, Reidy JA, Kato K, Barr DB, et al. Improved quantitative detection of 11 urinary phthalate metabolites in humans using liquid chromatography/atmospheric pressure chemical ionization tandem mass spectrometry. *J Chromatogr B* 2003;789:393-404. (NHANES 1999-2000)

Silva MJ, Samandar E, Preau JL, Reidy JA, Needham LL, Calafat AM. Quantification of 22 phthalate metabolites in human urine. *J Chromatogr B* 2007;860:106-12. (NHANES 2005-2012)

Silva MJ, Slakman AR, Reidy JA, Preau JL, Herbert AR, Samandar E, et al. Analysis of human urine for 15 phthalate metabolites using automated solid-phase extraction. *J Chromatogr B* 2004;805:161-7. (NHANES 2001-2002)

Phytoestrogens and Metabolites

Valentin-Blasini L, Blount BC, Rogers HS, Needham LL. HPLC-MS/MS method for the measurement of seven phytoestrogens in human serum and urine. *J Expo Anal Environ Epidemiol* 2000;10:799-807.

Parker DL, Rybak ME, Pfeiffer CM. Phytoestrogen biomonitoring: an extractionless LC-MS/MS method for measuring urinary isoflavones and lignans by use of atmospheric pressure photoionization (APPI). *Anal Bioanal Chem* 2012;402:1123-1136. (NHANES 2005-2006 and later)

Rybak ME, Parker DL, Pfeiffer CM. Determination of urinary phytoestrogens by HPLC-MS/MS: A comparison of atmospheric pressure chemical ionization (APCI) and electrospray ionization (ESI). *J Chromatogr R* 2008;861:145-150. (NHANES 2003-2004)

Kuklennyik Z, Ye X, Reich JA, Needham LL, Calafat AM. Automated on-line and off-line solid phase extraction methods for measuring isoflavones and lignans in urine. *J Chromatogr Sci* 2004; 42:495-500.

Polycyclic Aromatic Hydrocarbon Metabolites

Li Z, Romanoff LC, Trinidad DA, Hussain N, Jones RS, Porter EN, et al. Measurement of urinary Monohydroxy polycyclic aromatic hydrocarbons using automated liquid-liquid extraction and gas chromatography/isotope dilution high-resolution mass spectrometry. *Anal Chem* 2006;78:5744-51.

Romanoff LC, Li Z, Young KJ, Blakely NC III, Patterson DG, Sandau CD. Automated solid-phase extraction method for measuring urinary polycyclic aromatic hydrocarbon metabolites in human biomonitoring using isotope-dilution gas chromatography high-resolution mass spectrometry. *J Chromatogr B* 2006;835:47-54.

Smith CJ, Huang WL, Walcott CJ, Turner WE, Grainger J, Patterson DG Jr. Quantification of monohydroxy-PAH metabolites in urine by solid-phase extraction with isotope dilution GC-HRMS. *Anal Bioanal Chem* 2002;372:216-220.

Heterocyclic Amines

Zhang L, Xia Y, Xia B, Nicodemus KJ, McGuffey J, McGahee E, Blount B, Wang L. High-throughput and sensitive analysis of urinary heterocyclic aromatic amines using isotope-dilution liquid chromatography-tandem mass spectrometry and robotic sample preparation system. *Anal Bioanal Chem*. 2016 Nov;408(28):8149-8161. Epub 2016 Sep 29.

Volatile Organic Compounds (VOCs), including Disinfection By-Products

Blount BC, Kobelski RJ, McElprang DO, Ashley DL, Morrow JC, Chambers DM, et al. Quantification of 31 volatile organic compounds in whole blood using solid-phase microextraction and gas chromatography-mass spectrometry. *J Chromatogr B Analyt Technol Biomed Life Sci* 2006;832: 292-301.

Alwis KU, Blount BC, Silva LK, Smith MM, Loose KH. Method for quantifying nitromethane in blood as a potential biomarker of halonitromethane exposure. *Environ Sci Technol* 2008;42 (7): 2522-7.

Bonin MA, Silva LK, Smith MM, Ashley DL, Blount BC. Measurement of trihalomethanes and methyl tert-butyl ether in whole blood using gas chromatography with high-resolution mass spectrometry. *J Anal Toxicol* 2005;29(2):81-9.

Chambers DM, Blount BC, McElprang DO, Waterhouse MG, Morrow J. Picogram measurement of volatile n-alkanes (n-hexane through n-dodecane) in blood using solid-phase microextraction to assess nonoccupational petroleum-based fuel exposure. *Anal Chem* 2008;80(12): 4666-74.

Chambers DM, McElprang DO, Mauldin JP, Hughes TM, Blount BC. Identification and elimination of polysiloxane curing agent interference encountered in the quantification of low picogram per milliliter methyl tert-butyl ether in blood by solid-phase microextraction headspace analysis. *Anal Chem* 2005;77 (9): 2912-9.

Chambers DM, McElprang DO, Waterhouse MG, Blount BC. An improved approach for accurate quantitation of benzene, toluene, ethylbenzene, xylene, and styrene in blood. *Anal Chem* 2006;78 (15): 5375-83.

Chambers DM, Ocariz JM, McGuirk MF, Bount BC. Impact of cigarette smoking on volatile organic compound (VOC) blood levels in the U.S. Population: NHANES 2003–2004. *Environ. Int.* 2011;37:1321-8.

Volatile Organic Compound (VOC) Metabolites

Alwis KU, Blount BC, Britt AS, Patel D, Ashley DL. Simultaneous analysis of 28 urinary VOC metabolites using ultra high performance liquid chromatography coupled with electrospray ionization tandem mass spectrometry (UPLC-ESI/MSMS). *Anal Chim Acta* 2012;750:152-60.

Polybrominated Diphenyl Ethers and PBB 153 (Pooled and Individual Samples)

Jones R, Edenfield E, Anderson S, Zhang Y, Sjodin A. Semi-automated extraction and cleanup method for measuring persistent organic pollutants in human serum. *Organohalogen Compounds* 2012;74: 97-8.

Sjodin A, Jones RS, Lapeza CR, Focant JF, McGahee EE III, Patterson DG. Semiautomated high-throughput extraction and cleanup method for the measurement of polybrominated diphenyl ethers, polybrominated biphenyls, and polychlorinated biphenyls in human serum. *Anal Chem* 2004;76:1921-7.

Organochlorine Pesticides and Metabolites, and Non-dioxin-like and mono-ortho-substituted Polychlorinated Biphenyls (Pooled and Individual Samples)

Barr JB, Maggio VL, Barr DB, Turner WE, Sjodin A, Sandau CD, et al. New high-resolution mass spectrometric approach for the measurement of polychlorinated biphenyls and organochlorine pesticides in human serum. *J Chromatog B* 2003;794:137-48.

Jones R, Edenfield E, Anderson S, Zhang Y and Sjodin A. Semi-automated extraction and cleanup method for measuring persistent organic pollutants in human serum. *Organohalogen Compounds* 2012;74:97-8.

Sjodin A, Jones RS, Lapeza CR, Focant JF, McGahee EE III, Patterson DG. Semiautomated high-throughput extraction and cleanup method for the measurement of polybrominated diphenyl ethers, polybrominated biphenyls, and polychlorinated biphenyls in human serum. *Anal Chem* 2004;76:1921-7.

Patterson DG Jr., Alexander LR, Turner WE, Isaacs SG, Needham LL. The development and application of a high resolution mass spectrometry method for measuring polychlorinated dibenzo-p-dioxins and dibenzofurans in serum. In: Clement RE, Sui KM, Hill HH Jr., eds. *Instrumentation for trace organic monitoring*. Chelsea, MI: Lewis Publishers; 1990. pp. 119-53.

Patterson DG Jr., Hampton L, Lapeza CR Jr., Belser WT, Green V, Alexander L, et al. High resolution gas chromatographic/high resolution mass spectrometric analysis of human serum on a whole weight and lipid basis for 2,3,7,8 TCDD. *Anal Chem* 1987;59:2000-5.

Patterson, DG Jr., Wong L-Y, Turner WE, Caudill SP, DiPietro ES, McClure PC, et al. Levels in the U.S. population of those persistent organic pollutants (2003-2004) included in the Stockholm Convention or in other Long-Range Transboundary Air Pollution Agreements. *Environ Sci Technol* 2009;43(4):1211-8.

Polychlorinated Dibenzo-*p*-dioxins and Dibenzofurans (Pooled and Individual Samples), and Coplanar Polychlorinated Biphenyls (Pooled and Individual Samples)

Patterson DG Jr., Alexander LR, Turner WE, Isaacs SG, Needham LL. The development and application of a high resolution mass spectrometry method for measuring polychlorinated dibenzo-p-dioxins and dibenzofurans in serum. In: Clement RE, Sui KM, Hill HH Jr., eds. *Instrumentation for Trace Organic Monitoring*. Chelsea, MI: Lewis Publishers; 1990. pp. 119-53.

Patterson DG Jr., Hampton L, Lapeza CR Jr., Belser WT, Green V, Alexander L, et al. High resolution gas chromatographic/high resolution mass spectrometric analysis of human serum on a whole weight and lipid basis for 2,3,7,8 TCDD. *Anal Chem* 1987;59:2000-5.

Patterson, DG Jr., Wong L-Y, Turner WE, Caudill SP, DiPietro ES, McClure PC, et al. Levels in the U.S. population of those persistent organic pollutants (2003-2004)

included in the Stockholm Convention or in other Long-Range Transboundary Air Pollution Agreements. *Environ Sci Technol* 2009;43(4):1211-8.

Turner WE, DiPietro E, Cash TP, McClure PC, Patterson DG Jr., Shirkhan H. An improved SPE extraction and automated sample cleanup method for serum PCDDs, PCDFs, and coplanar PCBs. *Organohalogen Compounds* 1994; 19: 31-5.

Turner WE, Whitfield WE, Cash TP, DiPietro ES, Anderson CJ, McClure PC, et al. Same sample cleanup for PCDDs/PCDFs/cPCBs, PCNs and PBDDs/PBDFs in human serum and quantification by GC/ID-HRMS. *Organohalogen Compounds* 2011; 73: 661-4.



Centers for Disease Control and Prevention
National Center for Environmental Health
Division of Laboratory Sciences
Mail Stop F-20
4770 Buford Highway, NE
Atlanta, GA 30341-3724

Telephone: (toll free) 1-800-CDC-INFO (1-800-232-4636)
Email: CDCINFO@cdc.gov
Website: <http://www.cdc.gov/exposurereport>