**Supporting Information**

Per- and Polyfluoroalkyl Substances in Sera from Children 3 to 11 Years of Age Participating in the National Health and Nutrition Examination Survey 2013–2014

Xiaoyun Ye, Kayoko Kato, Lee-Yang Wong, Tao Jia, Akil Kalathil, John Latremouille, Antonia M. Calafat\*

Division of Laboratory Sciences, National Center for Environmental Health, Centers for Disease Control and Prevention, Atlanta, GA 30341

**\*Corresponding Author**

Antonia M. Calafat

Centers for Disease Control and Prevention

4770 Buford Hwy, Mailstop F17

Atlanta, GA 30341

770-488-7891

Aic7@cdc.gov

Table S1. Geometric mean, select percentiles of serum concentrations of linear PFOS (n-PFOS) [ng/mL (95% CI)], sample size, and weighted percent detection frequency by demographic characteristics in the U.S. population 3–11 years of age from NHANES 2013–2014.

|  | **Geometric** | **Selected percentile** | **Sample** | **Weighted** |
| --- | --- | --- | --- | --- |
|  | **Survey** | **mean** | ( 95% confidence interval) | **size** | **Detection** |
|  | **years** | (95% confidence interval) | **50th** | **75th** | **90th** | **95th** |  | **Percent** |
| **Total** | 13–14 | **2.51** | (2.30–2.74) | **2.47** | (2.17–2.73) | **3.57** | (3.10–4.08) | **5.60** | (4.50–6.34) | **7.72** | (5.75–8.68) | 639 | 100 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Age group** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3–5 years | 13–14 | **2.22** | (2.01–2.46) | **2.11** | (1.74–2.33) | **3.28** | (2.69–4.15) | **5.52** | (3.95–6.34) | **6.19** | (5.72–7.72) | 181 | 100 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6–11 years | 13–14 | **2.67** | (2.43–2.92) | **2.65** | (2.38–2.78) | **3.72** | (3.20–4.11) | **5.62** | (4.52–7.75) | **8.41** | (5.91–9.54) | 458 | 100 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Sex** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Males | 13–14 | **2.67** | (2.33–3.06) | **2.67** | (2.20–2.93) | **4.14** | (3.51–4.52) | **5.74** | (4.36–8.37) | **8.83** | (5.74–10.3) | 343 | 100 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Females | 13–14 | **2.36** | (2.19–2.54) | **2.24** | (2.03–2.48) | **3.07** | (2.84–3.33) | **4.97** | (4.02–5.55) | **6.08** | (5.18–7.72) | 296 | 100 |
| **Race/ethnicity** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Hispanic | 13–14 | **2.29** | (2.00–2.61) | **2.18** | (1.93–2.51) | **3.07** | (2.73–3.80) | **4.96** | (3.52–6.51) | **5.94** | (4.29–9.62) | 220 | 100 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Non-Hispanic | 13–14 | **2.59** | (2.35–2.85) | **2.55** | (2.19–2.78) | **3.82** | (3.09–4.25) | **5.71** | (4.50–7.14) | **7.75** | (5.74–9.04) | 419 | 100 |

Table S2. Geometric mean, select percentiles of serum concentrations of sum of perfluoromethylheptane sulfonate isomers (Sm-PFOS) [ng/mL (95% CI)], sample size, and weighted percent detection frequency by demographic characteristics in the U.S. population 3–11 years of age from NHANES 2013–2014.

|  | **Geometric** | **Selected percentile** | **Sample** | **Weighted** |
| --- | --- | --- | --- | --- |
|  | **Survey** | **mean** | ( 95% confidence interval) | **size** | **Detection** |
|  | **years** | (95% confidence interval) | **50th** | **75th** | **90th** | **95th** |  | **Percent** |
| **Total** | 13–14 | **1.23** | (1.09–1.40) | **1.28** | (1.05–1.45) | **1.90** | (1.64–2.21) | **3.02** | (2.57–3.92) | **4.07** | (3.23–4.78) | 639 | 100 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Age group** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3–5 years | 13–14 | **1.03** | (.874–1.21) | **1.00** | (.820–1.32) | **1.65** | (1.40–2.14) | **2.63** | (2.14–3.23) | **3.60** | (2.21–4.23) | 181 | 100 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6–11 years | 13–14 | **1.35** | (1.19–1.52) | **1.41** | (1.19–1.51) | **2.03** | (1.74–2.48) | **3.32** | (2.59–4.10) | **4.25** | (3.26–6.00) | 458 | 100 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Gender** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Males | 13–14 | **1.26** | (1.08–1.48) | **1.31** | (1.04–1.46) | **2.07** | (1.67–2.56) | **3.44** | (2.56–4.25) | **4.25** | (3.02–5.55) | 343 | 100 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Females | 13–14 | **1.20** | (1.04–1.39) | **1.22** | (1.03–1.48) | **1.79** | (1.53–2.25) | **2.90** | (2.18–3.60) | **3.60** | (2.54–5.28) | 296 | 100 |
| **Race/ethnicity** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Hispanic | 13–14 | **1.13** | (.997–1.27) | **1.12** | (.990–1.33) | **1.67** | (1.45–1.89) | **2.28** | (1.93–2.94) | **3.14** | (2.21–3.63) | 220 | 100 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Non-Hispanic | 13–14 | **1.27** | (1.11–1.46) | **1.32** | (1.13–1.49) | **2.05** | (1.66–2.48) | **3.48** | (2.65–4.10) | **4.23** | (3.60–5.28) | 419 | 100 |

Table S3. Geometric mean, select percentiles of serum concentrations of linear PFOA (n-PFOA) [ng/mL (95% CI)], sample size, and weighted percent detection frequency by demographic characteristics in the U.S. population 3–11 years of age from NHANES 2013–2014.

|  | **Geometric** | **Selected percentile** | **Sample** | **Weighted** |
| --- | --- | --- | --- | --- |
|  | **Survey** | **mean** | ( 95% confidence interval) | **size** | **Detection** |
|  | **years** | (95% confidence interval) | **50th** | **75th** | **90th** | **95th** |  | **Percent** |
| **Total** | 13–14 | **1.81** | (1.64–2.01) | **1.82** | (1.57–2.04) | **2.51** | (2.30–2.81) | **3.46** | (2.94–3.94) | **4.07** | (3.53–5.32) | 639 | 100 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Age group** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3–5 years | 13–14 | **1.87** | (1.62–2.17) | **1.72** | (1.50–2.25) | **2.87** | (2.50–3.21) | **4.07** | (2.81–5.79) | **5.32** | (3.01–6.51) | 181 | 99 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6–11 years | 13–14 | **1.78** | (1.61–1.97) | **1.84** | (1.59–2.04) | **2.45** | (2.18–2.73) | **3.19** | (2.83–3.61) | **3.77** | (3.43–3.97) | 458 | 100 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Sex** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Males | 13–14 | **1.83** | (1.65–2.04) | **1.80** | (1.55–2.09) | **2.64** | (2.28–3.19) | **3.55** | (3.13–3.93) | **4.07** | (3.34–5.79) | 343 | 100 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Females | 13–14 | **1.79** | (1.57–2.03) | **1.84** | (1.57–2.04) | **2.48** | (2.23–2.73) | **3.21** | (2.81–3.97) | **4.08** | (2.92–5.32) | 296 | 100 |
| **Race/ethnicity** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Hispanic | 13–14 | **1.61** | (1.46–1.78) | **1.60** | (1.45–1.83) | **2.23** | (1.95–2.48) | **2.84** | (2.37–3.20) | **3.18** | (2.78–3.93) | 220 | 100 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Non-Hispanic | 13–14 | **1.88** | (1.68–2.11) | **1.88** | (1.63–2.23) | **2.66** | (2.39–3.01) | **3.64** | (3.13–4.15) | **4.15** | (3.55–5.79) | 419 | 100 |

Table S4. Geometric mean, select percentiles of serum concentrations of sum of branched isomers of PFOA (Sb-PFOA) [ng/mL (95% CI)], sample size, and weighted percent detection frequency by demographic characteristics in the U.S. population 3–11 years of age from NHANES 2013–2014.

|  | **Geometric** | **Selected percentile** | **Sample** | **Weighted** |
| --- | --- | --- | --- | --- |
|  | **Survey** | **mean** | ( 95% confidence interval) | **size** | **Detection** |
|  | **years** | (95% confidence interval) | **50th** | **75th** | **90th** | **95th** |  | **Percent** |
| **Total** | 13–14 | **\*** |  | **< LOD** |  | **.100** | (<LOD–.120) | **.160** | (.120–.230) | **.230** | (.180–.360) | 639 | 28 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Age group** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3–5 years | 13–14 | **\*** |  | **< LOD** |  | **.100** | (<LOD–.190) | **.200** | (.120–.280) | **.280** | (.160–.510) | 181 | 27 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6–11 years | 13–14 | **\*** |  | **< LOD** |  | **.100** | (<LOD–.120) | **.160** | (.130–.200) | **.230** | (.170–.340) | 458 | 29 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Gender** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Males | 13–14 | **\*** |  | **< LOD** |  | **.110** | (<LOD–.130) | **.180** | (.150–.200) | **.220** | (.170–.310) | 343 | 27 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Females | 13–14 | **\*** |  | **< LOD** |  | **.100** | (<LOD–.130) | **.160** | (.110–.310) | **.230** | (.150–.450) | 296 | 29 |
| **Race/ethnicity** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Hispanic | 13–14 | **\*** |  | **< LOD** |  | **.100** | (<LOD–.110) | **.150** | (.120–.170) | **.190** | (.150–.250) | 220 | 25 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Non-Hispanic | 13–14 | **\*** |  | **< LOD** |  | **.110** | (<LOD–.150) | **.180** | (.130–.230) | **.250** | (.180–.470) | 419 | 29 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| < LOD means less than the limit of detection of 0.1 ng/mL.\* Not calculated. Proportion of results below limit of detection was too high to provide a valid result. |

Supporting Information Table S5. Geometric mean, select percentiles of serum concentrations of perfluorobutane sulfonic acid [ng/mL (95% CI)], sample size, and weighted percent detection frequency by demographic characteristics in the U.S. population 3-11 years of age from NHANES 2013–2014.

|  | **Geometric** | **Selected percentile** | **Sample** | **Weighted** |
| --- | --- | --- | --- | --- |
|  | **Survey** | **mean** | ( 95% confidence interval) | **size** | **Detection** |
|  | **years** | (95% confidence interval) | **50th** | **75th** | **90th** | **95th** |  | **Percent** |
| **Total** | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | 639 | 5 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Age group** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3-5 years | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | 181 | 1 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6-11 years | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | **.130** | (<LOD-.140) | 458 | 7 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Gender** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Males | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | **.130** | (<LOD-.130) | 343 | 6 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Females | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | 296 | 4 |
| **Race/ethnicity** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Hispanic | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | 220 | 2 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Non-Hispanic | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | **.130** | (<LOD-.140) | 419 | 6 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| < LOD means less than the limit of detection of 0.1 ng/mL.\* Not calculated. Proportion of results below limit of detection was too high to provide a valid result. |

Supporting Information Table S6. Geometric mean, select percentiles of serum concentrations of perfluorooctane sulfonamide [ng/mL (95% CI)], sample size, and weighted percent detection frequency by demographic characteristics in the U.S. population 3-11 years of age from NHANES 2013–2014.

|  | **Geometric** | **Selected percentile** | **Sample** | **Weighted** |
| --- | --- | --- | --- | --- |
|  | **Survey** | **mean** | ( 95% confidence interval) | **size** | **Detection** |
|  | **years** | (95% confidence interval) | **50th** | **75th** | **90th** | **95th** |  | **Percent** |
| **Total** | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | 639 | 3 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Age group** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3-5 years | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | **.110** | (<LOD-.170) | 181 | 7 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6-11 years | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | 458 | 2 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Gender** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Males | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | 343 | 2 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Females | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | 296 | 5 |
| **Race/ethnicity** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Hispanic | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | 220 | 2 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Non-Hispanic | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | 419 | 4 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| < LOD means less than the limit of detection of 0.1 ng/mL.\* Not calculated. Proportion of results below limit of detection was too high to provide a valid result. |

Supporting Information Table S7. Geometric mean, select percentiles of serum concentrations of 2-(N-methyl-perfluorooctane sulfonamido) acetic acid [ng/mL (95% CI)], sample size, and weighted percent detection frequency by demographic characteristics in the U.S. population 3-11 years of age from NHANES 2013–2014.

|  | **Geometric** | **Selected percentile** | **Sample** | **Weighted** |
| --- | --- | --- | --- | --- |
|  | **Survey** | **mean** | ( 95% confidence interval) | **size** | **Detection** |
|  | **years** | (95% confidence interval) | **50th** | **75th** | **90th** | **95th** |  | **Percent** |
| **Total** | 13-14 | **\*** |  | **.110** | (<LOD-.150) | **.260** | (.190-.390) | **.650** | (.360-1.02) | **1.02** | (.650-1.81) | 639 | 53 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Age group** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3-5 years | 13-14 | **\*** |  | **.110** | (<LOD-.190) | **.240** | (.170-.550) | **.880** | (.250-1.81) | **1.02** | (.530-3.15) | 181 | 51 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6-11 years | 13-14 | **\*** |  | **.110** | (<LOD-.140) | **.270** | (.180-.370) | **.570** | (.350-.940) | **.940** | (.570-1.92) | 458 | 54 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Gender** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Males | 13-14 | **\*** |  | **.100** | (<LOD-.170) | **.270** | (.180-.480) | **.870** | (.360-1.37) | **1.14** | (.690-1.99) | 343 | 51 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Females | 13-14 | **\*** |  | **.120** | (<LOD-.140) | **.260** | (.180-.360) | **.490** | (.290-.860) | **.810** | (.590-.970) | 296 | 56 |
| **Race/ethnicity** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Hispanic | 13-14 | **\*** |  | **< LOD** |  | **.160** | (.100-.280) | **.440** | (.250-.650) | **.650** | (.440-1.02) | 220 | 37 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Non-Hispanic | 13-14 | **\*** |  | **.130** | (<LOD-.190) | **.280** | (.220-.420) | **.810** | (.400-1.04) | **1.14** | (.860-1.99) | 419 | 59 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| < LOD means less than the limit of detection of 0.1 ng/mL.\* Not calculated. Proportion of results below limit of detection was too high to provide a valid result. |

Supporting Information Table S8. Geometric mean, select percentiles of serum concentrations of 2-(N-ethyl-perfluorooctane sulfonamido) acetic acid [ng/mL (95% CI)], sample size, and weighted percent detection frequency by demographic characteristics in the U.S. population 3-11 years of age from NHANES 2013–2014.

|  | **Geometric** | **Selected percentile** | **Sample** | **Weighted** |
| --- | --- | --- | --- | --- |
|  | **Survey** | **mean** | ( 95% confidence interval) | **size** | **Detection** |
|  | **years** | (95% confidence interval) | **50th** | **75th** | **90th** | **95th** |  | **Percent** |
| **Total** | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | 639 | 3 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Age group** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3-5 years | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | 181 | 4 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6-11 years | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | 458 | 3 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Gender** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Males | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | **.100** | (<LOD-.140) | 343 | 5 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Females | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | 296 | 2 |
| **Race/ethnicity** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Hispanic | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | 220 | 1 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Non-Hispanic | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | 419 | 4 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| < LOD means less than the limit of detection of 0.1 ng/mL.\* Not calculated. Proportion of results below limit of detection was too high to provide a valid result. |

Supporting Information Table S9. Geometric mean, select percentiles of serum concentrations of perfluoroheptanoic acid [ng/mL (95% CI)], sample size, and weighted percent detection frequency by demographic characteristics in the U.S. population 3-11 years of age from NHANES 2013–2014.

|  | **Geometric** | **Selected percentile** | **Sample** | **Weighted** |
| --- | --- | --- | --- | --- |
|  | **Survey** | **mean** | ( 95% confidence interval) | **size** | **Detection** |
|  | **years** | (95% confidence interval) | **50th** | **75th** | **90th** | **95th** |  | **Percent** |
| **Total** | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **.150** | (.110-.190) | **.210** | (.150-.300) | 639 | 19 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Age group** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3-5 years | 13-14 | **\*** |  | **< LOD** |  | **.110** | (<LOD-.170) | **.190** | (.140-.310) | **.310** | (.180-.440) | 181 | 27 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6-11 years | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **.130** | (<LOD-.150) | **.170** | (.130-.240) | 458 | 15 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Gender** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Males | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **.140** | (.110-.180) | **.190** | (.140-.300) | 343 | 20 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Females | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **.150** | (<LOD-.250) | **.230** | (.150-.390) | 296 | 18 |
| **Race/ethnicity** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Hispanic | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **.170** | (.110-.230) | **.230** | (.170-.250) | 220 | 24 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Non-Hispanic | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **.150** | (.100-.190) | **.190** | (.140-.390) | 419 | 18 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| < LOD means less than the limit of detection of 0.1 ng/mL.\* Not calculated. Proportion of results below limit of detection was too high to provide a valid result. |

Supporting Information Table S10. Geometric mean, select percentiles of serum concentrations of perfluorodecanoic acid [ng/mL (95% CI)], sample size, and weighted percent detection frequency by demographic characteristics in the U.S. population 3-11 years of age from NHANES 2013–2014.

|  | **Geometric** | **Selected percentile** | **Sample** | **Weighted** |
| --- | --- | --- | --- | --- |
|  | **Survey** | **mean** | ( 95% confidence interval) | **size** | **Detection** |
|  | **years** | (95% confidence interval) | **50th** | **75th** | **90th** | **95th** |  | **Percent** |
| **Total** | 13-14 | **\*** |  | **< LOD** |  | **.170** | (.140-.220) | **.300** | (.240-.340) | **.370** | (.300-.420) | 639 | 47 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Age group** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3-5 years | 13-14 | **\*** |  | **.100** | (<LOD-.130) | **.170** | (.130-.270) | **.340** | (.190-.440) | **.370** | (.230-.930) | 181 | 50 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6-11 years | 13-14 | **\*** |  | **< LOD** |  | **.180** | (.160-.200) | **.290** | (.240-.320) | **.350** | (.310-.390) | 458 | 46 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Gender** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Males | 13-14 | **\*** |  | **< LOD** |  | **.170** | (.120-.230) | **.300** | (.230-.340) | **.370** | (.260-.460) | 343 | 44 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Females | 13-14 | **\*** |  | **.100** | (<LOD-.110) | **.180** | (.160-.230) | **.290** | (.240-.350) | **.380** | (.280-.470) | 296 | 51 |
| **Race/ethnicity** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Hispanic | 13-14 | **\*** |  | **< LOD** |  | **.170** | (.140-.210) | **.270** | (.230-.340) | **.400** | (.270-.420) | 220 | 45 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Non-Hispanic | 13-14 | **\*** |  | **< LOD** |  | **.170** | (.130-.230) | **.300** | (.240-.350) | **.370** | (.290-.460) | 419 | 48 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| < LOD means less than the limit of detection of 0.1 ng/mL.\* Not calculated. Proportion of results below limit of detection was too high to provide a valid result. |

Supporting Information Table S11. Geometric mean, select percentiles of serum concentrations of perfluoroundecanoic acid [ng/mL (95% CI)], sample size, and weighted percent detection frequency by demographic characteristics in the U.S. population 3-11 years of age from NHANES 2013–2014.

|  | **Geometric** | **Selected percentile** | **Sample** | **Weighted** |
| --- | --- | --- | --- | --- |
|  | **Survey** | **mean** | ( 95% confidence interval) | **size** | **Detection** |
|  | **years** | (95% confidence interval) | **50th** | **75th** | **90th** | **95th** |  | **Percent** |
| **Total** | 13-14 | **\*** |  | **< LOD** |  | **.100** | (<LOD-.130) | **.200** | (.150-.270) | **.280** | (.210-.480) | 639 | 28 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Age group** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3-5 years | 13-14 | **\*** |  | **< LOD** |  | **.110** | (<LOD-.140) | **.250** | (.110-.480) | **.370** | (.140-.650) | 181 | 27 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6-11 years | 13-14 | **\*** |  | **< LOD** |  | **.100** | (<LOD-.130) | **.190** | (.160-.240) | **.250** | (.200-.310) | 458 | 28 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Gender** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Males | 13-14 | **\*** |  | **< LOD** |  | **.100** | (<LOD-.140) | **.190** | (.150-.270) | **.300** | (.180-.530) | 343 | 26 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Females | 13-14 | **\*** |  | **< LOD** |  | **.110** | (<LOD-.130) | **.200** | (.140-.280) | **.280** | (.200-.440) | 296 | 29 |
| **Race/ethnicity** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Hispanic | 13-14 | **\*** |  | **< LOD** |  | **.100** | (<LOD-.140) | **.190** | (.150-.220) | **.250** | (.190-.370) | 220 | 27 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Non-Hispanic | 13-14 | **\*** |  | **< LOD** |  | **.110** | (<LOD-.140) | **.200** | (.140-.300) | **.300** | (.200-.480) | 419 | 28 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| < LOD means less than the limit of detection of 0.1 ng/mL.\* Not calculated. Proportion of results below limit of detection was too high to provide a valid result. |

Supporting Information Table S12. Geometric mean, select percentiles of serum concentrations of perfluorododecanoic acid [ng/mL (95% CI)], sample size, and weighted percent detection frequency by demographic characteristics in the U.S. population 3-11 years of age from NHANES 2013–2014.

|  | **Geometric** | **Selected percentile** | **Sample** | **Weighted** |
| --- | --- | --- | --- | --- |
|  | **Survey** | **mean** | ( 95% confidence interval) | **size** | **Detection** |
|  | **years** | (95% confidence interval) | **50th** | **75th** | **90th** | **95th** |  | **Percent** |
| **Total** | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | 639 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Age group** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3-5 years | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | 181 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6-11 years | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | 458 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Gender** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Males | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | 343 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Females | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | 296 | 0 |
| **Race/ethnicity** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Hispanic | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | 220 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Non-Hispanic | 13-14 | **\*** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | **< LOD** |  | 419 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| < LOD means less than the limit of detection of 0.1 ng/mL.\* Not calculated. Proportion of results below limit of detection was too high to provide a valid result. |

Supporting Information Table S13. Pearson correlations among the log-transformed PFAS concentrations, with detection rate above 60%.a

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variable | Sm-PFOS | n-PFOA | n-PFOS | PFHxS | PFNA |
| Sm-PFOS | 1 | 0.46 | 0.60 | 0.52 | 0.27 |
|  |  |  |  |  |  |
| n-PFOA |  | 1 | 0.50 | 0.45 | 0.39 |
|  |  |  |  |  |  |
| n-PFOS |  |  | 1 | 0.58 | 0.35 |
|  |  |  |  |  |  |
| PFHxS |  |  |  | 1 | 0.24 |
|  |  |  |  |  |  |
| PFNA |  |  |  |  | 1 |
|  |  |  |  |  |  |

aAll *p* values are <0.0001

Supporting Information Table S14. Observed *p* values for differences between geometric mean concentrations in univariate analyses and least square geometric mean concentrations in multiple regression analyses of ΣPFOS, Sm-PFOS, n-PFOS, ΣPFOA, n-PFOA, PFHxS, and PFNA for various demographic groups.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Univariate Analyses** | N | ΣPFOS | Sm–PFOS | n–PFOS | ΣPFOA | n–PFOA | PFHxS | PFNA |
| Hispanic vs non-Hispanic | 639 | 0.0324 | 0.0483 | 0.0836 | 0.0038 | 0.0045 | 0.19 | 0.4393 |
| 3–5 years vs 6–11 years | 639 | 0.0004 | 0.0005 | 0.0016 | 0.2604 | 0.3677 | 0.0119 | 0.5535 |
| Male vs Female | 639 | 0.1313 | 0.5389 | 0.0654 | 0.6252 | 0.65 | 0.0035 | 0.3218 |
| Income <$45,000 vs income ≥$45,000 | 613 | 0.2921 | 0.1198 | 0.6986 | 0.0593 | 0.0545 | 0.7737 | 0.514 |
| BMI (underweight/normal vs overweight/obese) | 637 | 0.2698 | 0.4392 | 0.2978 | 0.052 | 0.0603 | 0.0996 | 0.5501 |
|  |  |  |  |  |  |  |  |  |
| **Multiple Regression Analysesa** |  | ΣPFOS | Sm–PFOS | n–PFOS | ΣPFOA | n–PFOA | PFHxS | PFNA |
| Male vs Female |  |  |  |  |  |  | 0.0047 |  |
| 3–5 years vs 6–11 years |  |  |  |  |  |  | 0.0123 |  |
| Hispanic vs non-Hispanic |  |  |  |  | 0.0038 | 0.0045 |  |  |
| 3–5 years, male vs female |  | 0.4831 |  | 0.713 |  |  |  |  |
| 6–11 years, male vs female |  | 0.0048 |  | 0.0016 |  |  |  |  |
| 3–5 years, Hispanic vs non-Hispanic |  | 0.7971 | 0.3371 |  |  |  |  |  |
| 6–11 years, Hispanic vs non-Hispanic |  | 0.0017 | 0.0006 |  |  |  |  |  |
| Hispanic, 3–5 years vs 6–11 years |  | 0.2832 | 0.7108 |  |  |  |  |  |
| Non-Hispanic, 3–5 years vs 6–11 years |  | 0.0548 | 0.0005 |  |  |  |  |  |
| Male, 3–5 years vs 6–11 years |  | 0.0003 |  | 0.0017 |  |  |  |  |
| Female, 3–5 years vs 6–11 years |  | 0.0548 |  | 0.3321 |  |  |  |  |

 **a**The final multivariate regression models included: race/ethnicity, age, sex, age×race/ethnicity, age×sex (ΣPFOS); age, sex, age×sex (n-PFOS); race/ethnicity, age, and age×race/ethnicity (Sm-PFOS); race (ΣPFOA and n-PFOA); and age and sex (PFHxS). We found no association between BMI or household income for any of the seven biomarkers, or between the demographic variables evaluated and PFNA.