Supplemental material

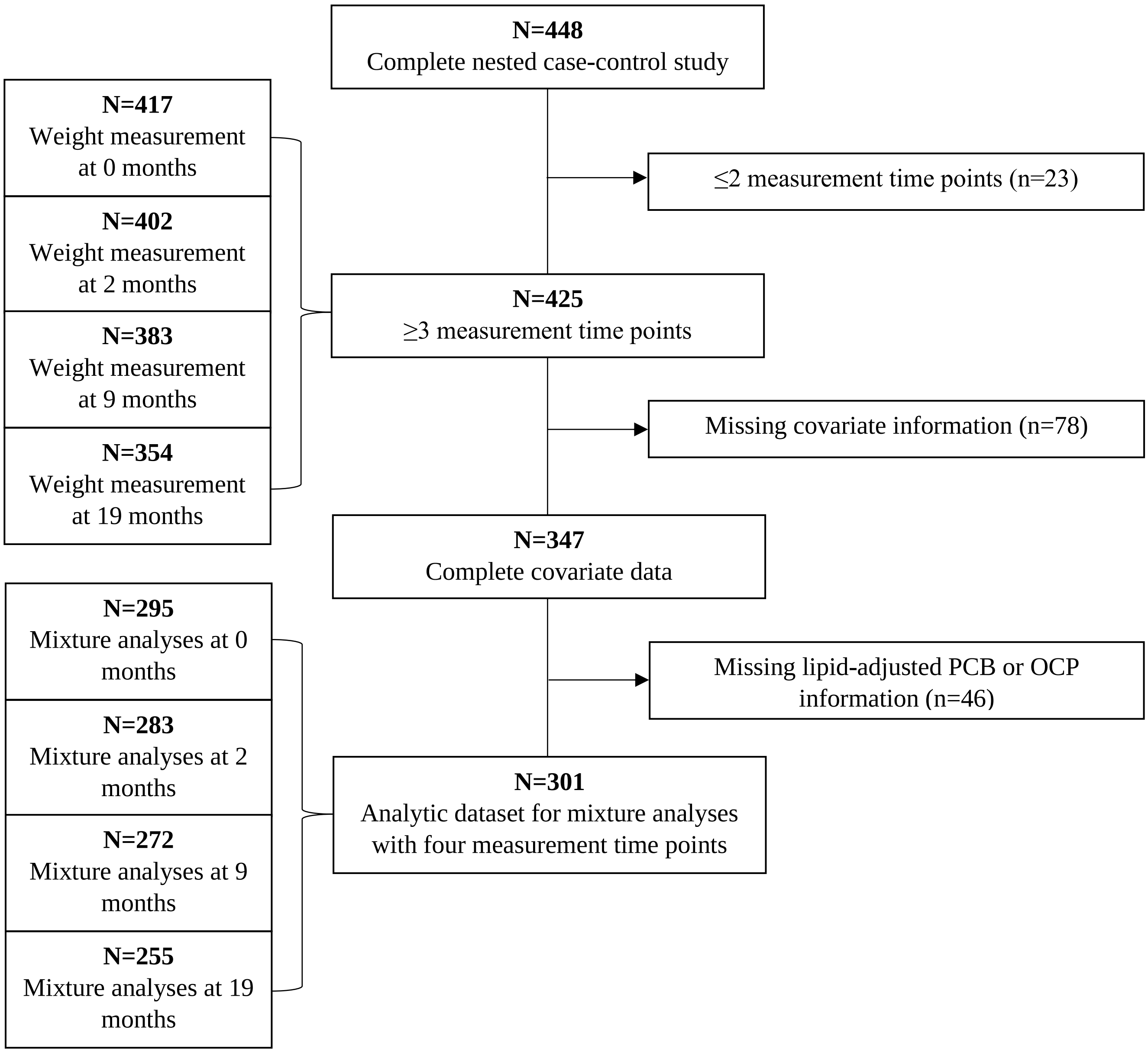

Figure S1. Flowchart depicting sample size in various models in the study of prenatal exposure to mixtures of persistent endocrine disrupting chemicals and postnatal body size in a sub-study of the Avon Longitudinal Study of Parents and Children.

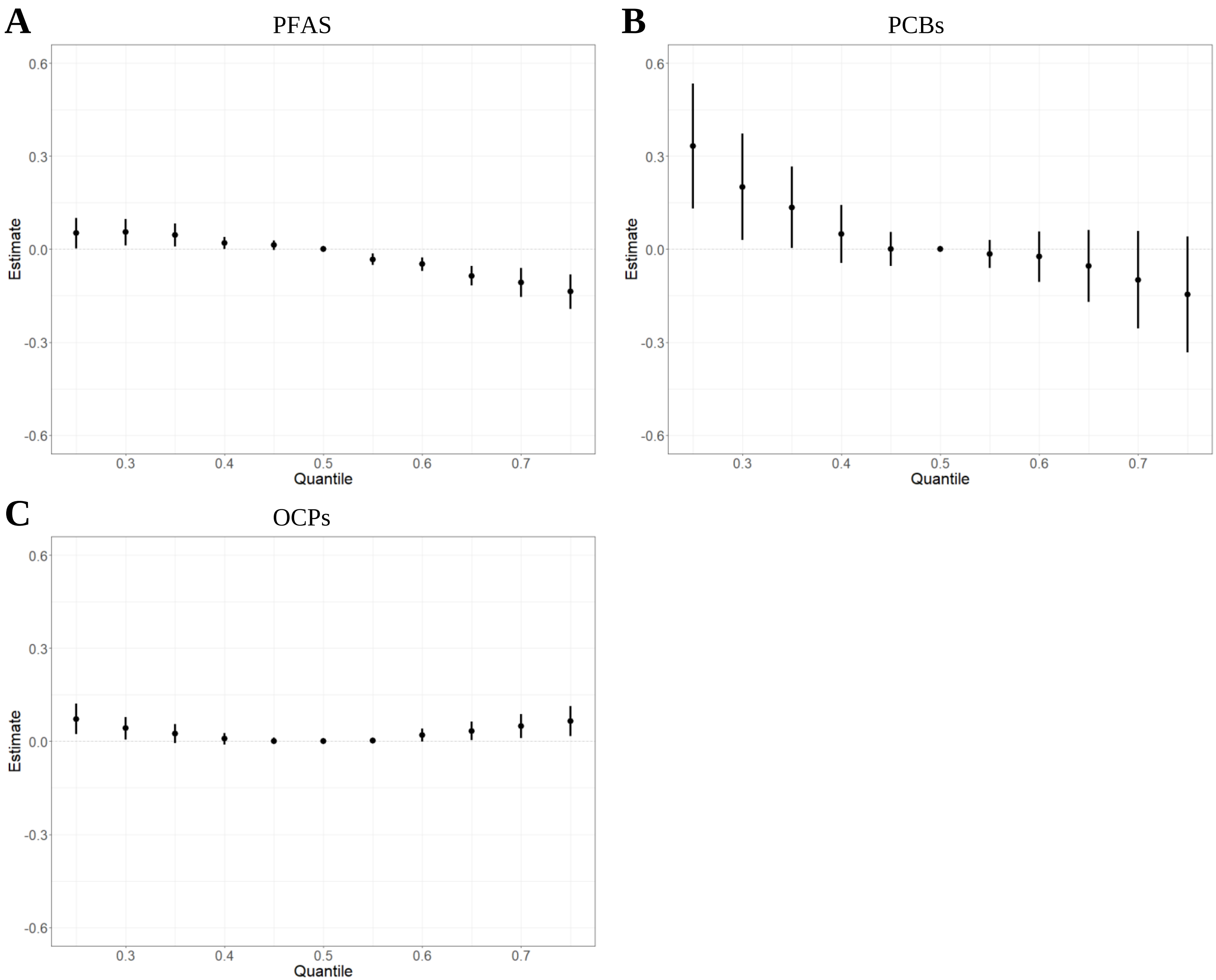
A
PFAS
B
PCBs
C
OCPs
Estimate
Quantile
0.6
0.3
0.0
-0.3
-0.6
0.3
0.4
0.5
0.6
0.7

Figure S2. A Overall effect of the PFAS mixture on weight-for-age z-scores (estimates and 95% credible intervals), comparing the outcome when all exposures are at a particular quantile to the median (n=347). **B** Overall effect of the PCB mixture on weight-for-age z-scores (estimates and 95% credible intervals), comparing the outcome when all concentrations are at a particular quantile to the median (n=308). **C** Overall effect of the OCP mixture on weight-for-age z-scores (estimates and 95% credible intervals), comparing the outcome when all concentrations are at a particular quantile to the median (n=319). Bayesian kernel machine regression models adjusted for maternal education, parity, pre-pregnancy body mass index, maternal age at delivery, prenatal smoking, age at measurement, and gestational week at sample collection, and used a random intercept to account for repeated measures at 0, 2, 9, and 19 months. All chemical concentrations were natural log-transformed and standardized; PCBs and OCPs were lipid adjusted.

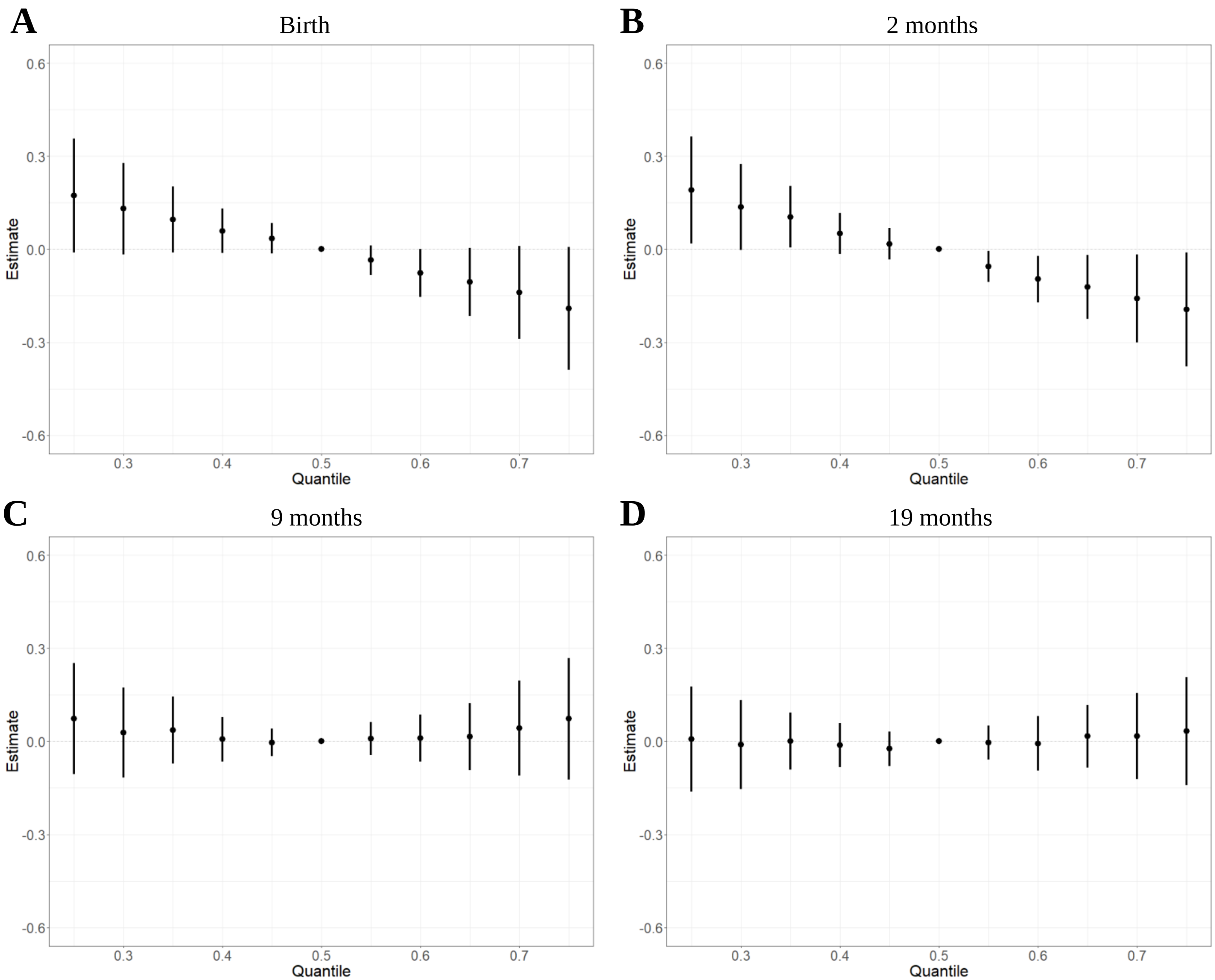
A
Birth
0.6
0.3
0.0
-0.3
-0.6
Estimate
0.3
0.4
0.5
0.6
0.7
Quantile
B
2 months
0.6
0.3
0.0
-0.3
-0.6
Estimate
0.3
0.4
0.5
0.6
0.7
Quantile
C
9 months
0.6
0.3
0.0
-0.3
-0.6
Estimate
0.3
0.4
0.5
0.6
0.7
Quantile
D
19 months
0.6
0.3
0.0
-0.3
-0.6
Estimate
0.3
0.4
0.5
0.6
0.7
Quantile

Figure S3. A Overall effect of the mixture (all three classes combined) on weight-for-age z-scores at birth (estimates and 95% credible intervals), comparing the outcome when all exposures are at a particular quantile to the median (n=295). **B** Overall effect of the mixture (all three classes combined) on weight-for-age z-scores at 2 months (estimates and 95% credible intervals), comparing the outcome when all concentrations are at a particular quantile to the median (n=283). **C** Overall effect of the mixture (all three classes combined) on weight-for-age z-scores at 9 months (estimates and 95% credible intervals), comparing the outcome when all concentrations are at a particular quantile to the median (n=272). **D** Overall effect of the mixture (all three classes combined) on weight-for-age z-scores at 19 months (estimates and 95% credible intervals), comparing the outcome when all concentrations are at a particular quantile to the median (n=255). Bayesian kernel machine regression models adjusted for maternal education, parity, pre-pregnancy body mass index, maternal age at delivery, prenatal smoking, and gestational week at sample collection. All chemical concentrations were natural log-transformed and standardized; PCBs and OCPs were lipid adjusted.

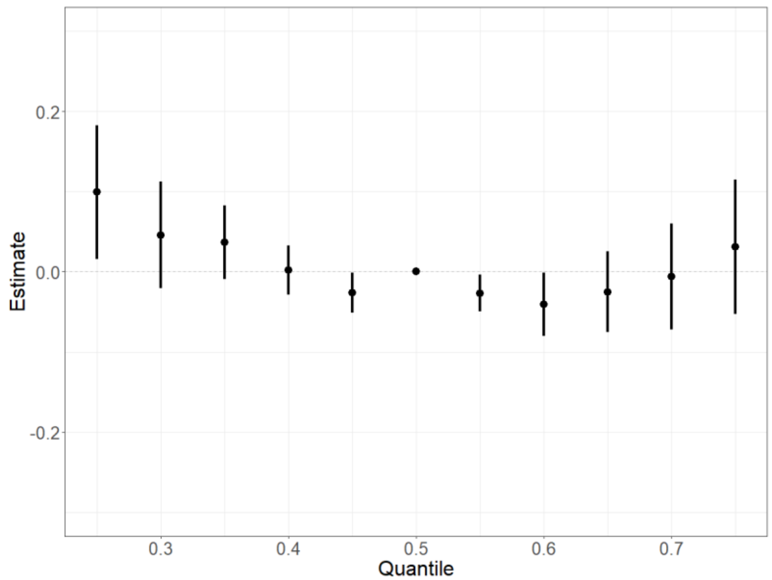

Figure S4. Overall effect of the mixture (all three classes combined) on weight-for-age z-scores (estimates and 95% credible intervals) excluding the birth weight measurements, comparing the outcome when all concentrations are at a particular quantile to the median (n=301). The Bayesian kernel machine regression model adjusted for maternal education, parity, pre-pregnancy body mass index, maternal age at delivery, prenatal smoking, age at measurement, and gestational week at sample collection, and used a random intercept to account for repeated measures at 2, 9, and 19 months. All chemical concentrations were natural log-transformed and standardized; PCB and OCP concentrations were lipid-adjusted.

Table S1. Persistent endocrine disrupting chemicals measured in maternal serum in the ALSPAC nested case-control study.

Chemical Name	Abbreviated Name	Limit of Detection
Per- and Polyfluoroalkyl Substances		
Perfluorooctanoate	PFOA	0.10 ng/mL
Perfluorooctane sulfonate	PFOS	0.20 ng/mL
Perfluorohexane sulfonate	PFHxS	0.10 ng/mL
Perfluorononanoate	PFNA	0.082 ng/mL
2-(N-methyl-perfluorooctanesulfonamido) acetate	MeFOSAA	0.174 ng/mL
2-(N-ethyl-perfluorooctanesulfonamido) acetate	EtFOSAA	0.20 ng/mL
Perfluorooctane sulfonamide	FOSA	0.10 ng/mL
Perfluorodecanoate	PFDA	0.20 ng/mL
Polychlorinated Biphenyls		
2,4,4'-trichlorobiphenyl	PCB28	Individual[a]
2,2',3,5'-tetrachlorobiphenyl	PCB44	Individual[a]
2,2',4,5'-tetrachlorobiphenyl	PCB49	Individual[a]
2,2',5,5'-tetrachlorobiphenyl	PCB52	Individual[a]
2,3',4,4'-tetrachlorobiphenyl	PCB66	Individual[a]
2,4,4',5-tetrachlorobiphenyl	PCB74	Individual[a]
2,2',3,4,5'-pentachlorobiphenyl	PCB87	Individual[a]
2,2',4,4',5-pentachlorobiphenyl	PCB99	Individual[a]
2,2',4,5,5'-pentachlorobiphenyl	PCB101	Individual[a]
2,3,3',4,4'-pentachlorobiphenyl	PCB105	Individual[a]
2,3,3',4',6-pentachlorobiphenyl	PCB110	Individual[a]
2,3',4,4',5-pentachlorobiphenyl	PCB118	Individual[a]

2,2',3,3',4,4'-hexachlorobiphenyl	PCB128	Individual[a]
2,2',3,4,4',5'-hexachlorobiphenyl & 2,3,3',4,4',6-hexachlorobiphenyl	PCB138-158	Individual[a]
2,2',3,4',5,5'-hexachlorobiphenyl	PCB146	Individual[a]
2,2',3,4',5',6-hexachlorobiphenyl	PCB149	Individual[a]
2,2',3,5,5',6-hexachlorobiphenyl	PCB151	Individual[a]
2,2',4,4',5,5'-hexachlorobiphenyl	PCB153	Individual[a]
2,3,3',4,4',5-hexachlorobiphenyl	PCB156	Individual[a]
2,3,3',4,4',5'-hexachlorobiphenyl	PCB157	Individual[a]
2,3',4,4',5,5'-hexachlorobiphenyl	PCB167	Individual[a]
2,2',3,3',4,4',5-heptachlorobiphenyl	PCB170	Individual[a]
2,2',3,3',4,5,5'-heptachlorobiphenyl	PCB172	Individual[a]
2,2',3,3',4',5,6-heptachlorobiphenyl	PCB177	Individual[a]
2,2',3,3',5,5',6-heptachlorobiphenyl	PCB178	Individual[a]
2,2',3,4,4',5,5'-heptachlorobiphenyl	PCB180	Individual[a]
2,2',3,4,4',5',6-heptachlorobiphenyl	PCB183	Individual[a]
2,2',3,4',5,5',6-heptachlorobiphenyl	PCB187	Individual[a]
2,3,3',4,4',5,5'-heptachlorobiphenyl	PCB189	Individual[a]
2,2',3,3',4,4',5,5'-octachlorobiphenyl	PCB194	Individual[a]
2,2',3,3',4,4',5,6-octachlorobiphenyl	PCB195	Individual[a]
2,2',3,3',4,4',5',6-octachlorobiphenyl & 2,2',3,4,4',5,5',6-octachlorobiphenyl	PCB196-203	Individual[a]
2,2',3,3',4,5,6,6'-octachlorobiphenyl	PCB199	Individual[a]
2,2',3,3',4,4',5,5',6-nonachlorobiphenyl	PCB206	Individual[a]
Decachlorobiphenyl	PCB209	Individual[a]
Organochlorine Pesticides		
Hexachlorobenzene	HCB	Individual[a]
β-Hexachlorocyclohexane	β-HCH	Individual[a]
ϒ-Hexachlorocyclohexane (Lindane)	γ-HCH	Individual[a]

Oxychlordane	Oxychlordane	Individual[a]
Trans-Nonachlor	Trans-nonachlor	Individual[a]
2,2-Bis(4-chlorophenyl)-1,1-dichloroethene	p,p'-DDE	Individual[a]
2-(4-chlorophenyl)-2-(2-chlorophenyl)-1,1,1-trichloroethan	o,p'-DDT	Individual[a]
2,2-Bis(4-chlorophenyl)-1,1,1-trichloroethan	p,p'-DDT	Individual[a]
Mirex	Mirex	Individual[a]

[a]LODs for PCBs and OCPs are dependent on the size of the sample available, thus an individual LOD was reported for each individual result rather than an overall LOD. The range of individual LODs for most PCBs under study was 0.40–6.00 ng/g lipid. The range of individual LODs for OCPs was 2.10–30.20 ng/g lipid.

Table S2. Serum concentrations of persistent endocrine disrupting chemicals (EDCs) among mothers of the Avon Longitudinal Study of Parents and Children (ALSPAC) during pregnancy (median gestational age at sample collection: 15 weeks) (N=425 mother-daughter dyads).

	Serum concentrations			
	Median	**Q1**	**Q3**	**% <LOD[a]**
Per- and polyfluoroalkyl substances (ng/mL)				
PFOA	3.7	2.8	4.8	0.0
PFOS	19.6	15.0	25.0	0.0
PFHxS	1.6	1.2	2.2	0.2
PFNA	0.49	0.41	0.66	0.2
FOSA	0.20	<LOD	0.30	30.9
MeFOSAA	0.35	0.26	0.70	13.9
EtFOSAA	0.70	0.40	0.90	2.4
PFDA	<LOD	<LOD	<LOD	97.4
Polychlorinated biphenyls (PCBs) (ng/g lipid)				
PCB28	5.5	3.5	8.4	8.7
PCB44	1.9	<LOD	4.0	29.7
PCB49	<LOD	<LOD	1.9	57.7
PCB52	3.3	<LOD	7.7	29.4
PCB66	1.6	<LOD	2.5	30.8
PCB74	11.0	8.6	15.2	0.2
PCB87	<LOD	<LOD	1.7	59.5
PCB99	9.4	7.0	12.2	0.9
PCB101	2.3	<LOD	5.5	29.9
PCB105	2.8	2.0	3.9	7.5
PCB110	<LOD	<LOD	2.8	53.4

PCB118	14.8	10.8	20.4	0.2
PCB128	<LOD	<LOD	<LOD	89.4
PCB138_158[b]	41.2	30.2	53.8	0.2
PCB146	6.0	4.6	8.1	2.6
PCB149	<LOD	<LOD	1.9	60.7
PCB151	<LOD	<LOD	<LOD	78.8
PCB153	64.3	48.1	85.5	0.0
PCB156	6.3	4.8	8.3	1.4
PCB157	1.3	<LOD	1.9	33.9
PCB167	2.0	<LOD	2.9	26.1
PCB170	18.8	14.4	24.8	0.0
PCB172	1.9	1.1	2.7	22.8
PCB177	3.0	2.3	4.1	8.7
PCB178	2.7	1.8	3.7	14.4
PCB180	45.1	33.3	60.1	0.0
PCB183	6.1	4.6	8.1	3.5
PCB187	11.2	8.6	15.1	1.2
PCB189	<LOD	<LOD	0.7	74.6
PCB194	7.4	5.5	10.4	3.5
PCB195	2.2	1.5	2.9	19.1
PCB196_203[b]	7.6	5.7	10.5	2.1
PCB199	5.5	3.9	7.7	2.6
PCB206	2.3	1.7	3.2	10.6
PCB209	1.5	<LOD	2.0	27.5
Organochlorine pesticides (OCPs) (ng/g lipid)				
HCB	50.0	37.8	62.7	0.0
β-HCCH	46.8	34.5	60.8	1.4

γ-HCCH	<LOD	<LOD	<LOD	79.5
Oxychlordane	<LOD	<LOD	4.2	72.2
Trans-nonachlor	<LOD	<LOD	4.5	67.5
p,p'-DDE	311	190	493	0.2
o,p'-DDT	<LOD	<LOD	<LOD	98.4
p,p'-DDT	10.9	7.7	16.1	11.8
Mirex	<LOD	<LOD	<LOD	99.3

Abbreviations: Q1, quartile 1; Q3, quartile 3; LOD, limit of detection; ng/mL, nanogram per milliliter; ng/g lipid, nanogram per gram lipid

[a] The LODs for PFAS were 0.082 ng/mL for PFNA, 0.10 ng/mL for PFOA, PFHxS, and FOSA, 0.174 ng/mL for MeFOSAA, and 0.20 ng/mL for PFOS, EtFOSAA, and PFDA. Detection limits for analytes of OCPs and PCBs are dependent on the sample size and blanks, thus, an individual limit of detection is reported for each individual result rather than an overall limit of detection.

[b] PCB congeners 138 and 158 could not be separated and were quantified as a summed concentration, referred to as PCB138. Similarly, PCB congeners 196 and 203 could not be separated and were quantified as a summed concentration, referred to as PCB196.

Table S3. Adjusted[a] single[b]- and multi[c]-chemical associations of maternal serum concentrations of persistent endocrine disrupting chemicals (EDCs) and weight-for-age z-score at 19 months in the Avon Longitudinal Study of Parents and Children (ALSPAC) sub-study (N=296 mother-daughter dyads). Beta estimates represent the change in weight-for-age z-score for 10% higher chemical concentrations[d].

	Single-chemical models[be]		**Multi-chemical models[ce]**	
	β	**95% CI**	**β**	**95% CI**
Per- and polyfluoroalkyl substances (PFAS) (ng/mL)				
PFOA			-0.02	-0.07, 0.03
PFOS			-0.02	-0.07, 0.04
PFHxS			0.01	-0.01, 0.03
PFNA	0.01	-0.01, 0.04	0.02	-0.01, 0.06
MeFOSAA				
EtFOSAA			0.01	-0.01, 0.03
Polychlorinated biphenyls (PCBs) (ng/g lipid)				
PCB28				
PCB74	0.03	-0.01, 0.06	0.11	0.04, 0.19
PCB99			-0.01	-0.13, 0.11
PCB105			0.05	-0.08, 0.18
PCB118			-0.10	-0.26, 0.06
PCB138[f]			0.12	-0.11, 0.35
PCB146			0.01	-0.04, 0.06
PCB153			-0.26	-0.61, 0.10
PCB156	0.02	-0.01, 0.06	0.05	-0.09, 0.20
PCB170			-0.07	-0.31, 0.17
PCB172	0.01	-0.01, 0.03		

PCB177			-0.01	-0.07, 0.04
PCB178	0.02	-0.01, 0.05	0.02	-0.03, 0.07
PCB180			0.02	-0.26, 0.30
PCB183	0.01	-0.02, 0.04	0.02	-0.11, 0.14
PCB187	0.01	-0.02, 0.04	-0.10	-0.21, 0.02
PCB194	0.01	-0.01, 0.03	-0.02	-0.06, 0.02
PCB195	0.01	-0.01, 0.04		
PCB196[f]	0.03	-0.01, 0.07	0.16	0.01, 0.31
PCB199	0.03	0.00, 0.05	0.03	-0.03, 0.08
PCB206	0.02	-0.01, 0.05		
Organochlorine pesticides (OCPs) (ng/g lipid)				
HCB	0.01	-0.02, 0.05	-0.03	-0.08, 0.01
β-HCH	0.02	0.00, 0.05	0.04	0.01, 0.07
p,p'-DDE				
p,p'-DDT				

Abbreviations: CI, confidence interval; ng/mL, nanogram per milliliter; ng/g lipid, nanogram per gram lipid

[a] Adjusted for parity, pre-pregnancy BMI, maternal age at delivery, education, prenatal smoking, and gestational age at sample collection.

[b] Single-chemical linear regression models were run to examine associations between each chemical and weight-for-age z-scores. Betas represent a change of 10% higher chemical concentrations.

[c] Multi-chemical linear regression models were run to examine associations between each chemical in a class (e.g., PFAS) and weight-for-age z-scores, independent of other chemicals in the class (i.e., adjusting for other chemicals in the class). Betas represent a change of 10% higher chemical concentrations.

[d] 10% change in chemical concentrations calculated as β*ln(1.1)

[e] Only β values ≥|0.01| are displayed

[f] PCB congeners 138 and 158 could not be separated and were quantified as a summed concentration, referred to as

PCB138. Similarly, PCB congeners 196 and 203 could not be separated and were quantified as a summed concentration, referred to as PCB196.

Table S4. Adjusted[a] associations of mixtures with accompanying weights of maternal serum concentrations of persistent endocrine disrupting chemicals (EDCs) with weight-for-age z-scores at varying measurement time points in the Avon Longitudinal Study of Parents and Children (ALSPAC) sub-study (N=301 mother-daughter dyads) using weighted quantile sum regression. Estimates represent the change in weight-for-age z-score for one-unit higher of the WQS index (representing a one-decile increase in all chemical concentrations).

	0 months n=295			**2 months** n=283			**9 months** n=272			**19 months** n=255		
	β[b]	**95% CI**	**Weight[c]**	**β[b]**	**95% CI**	**Weight[c]**	**β[b]**	**95% CI**	**Weight[c]**	**β[b]**	**95% CI**	**Weight[c]**
Overall[d]	-0.19	-0.31, -0.08		-0.11	-0.24, 0.01		-0.04	-0.13, 0.05		-0.04	-0.15, 0.07	
PFOA			0.02			0.11†						0.03†
PFOS						0.02			0.05†			0.07†
PFHxS			0.04†			0.01						0.13†
PFNA			0.02			0.06†			0.01			0.09†
MeFOSAA			0.04†			0.26†			0.09†			0.01
EtFOSAA			0.19†			0.12†			0.01			0.03
PCB28			0.01			0.03†						0.01
PCB74			0.04†						0.01			0.01
PCB99			0.01			0.02						0.05†

PCB105				
PCB118				0.02
PCB138[e]				0.09†
PCB146	0.08†	0.03†	0.02	0.07†
PCB153	0.09†			0.16†
PCB156		0.03		0.01
PCB170				0.01
PCB172	0.04†	0.02		0.01
PCB177	0.01	0.02		
PCB178	0.02		0.13†	0.02
PCB180	0.03	0.01	0.04†	0.07†
PCB183				
PCB187		0.02	0.01	0.01
PCB194		0.01	0.02	0.06†
PCB195	0.02	0.01	0.04†	0.02
PCB196[e]			0.01	
PCB199	0.19†	0.12†	0.09†	
PCB206	0.02	0.01	0.46†	

HCB	0.01	0.06[†]		0.01
β-HCH	0.01	0.01		
p,p'-DDE	0.03	0.01		0.01
p,p'-DDT	0.09[†]	0.01		

Abbreviations: CI, confidence interval

[a] Adjusted for education, parity, pre-pregnancy body mass index, maternal age at delivery, prenatal smoking, and gestational week at sample collection

[b] β for one-unit higher of the WQS index (representing a one-decile increase in chemical concentrations)

[c] Weights greater than 1/number of chemicals in the mixture are considered significant contributors to the overall mixture effect; in this case, a weight over 0.032 (1/31).

[d] Overall mixture includes PFAS, PCB, and OCP classes

[e] PCB congeners 138 and 158 could not be separated and were quantified as a summed concentration, referred to as PCB138. Similarly, PCB congeners 196 and 203 could not be separated and were quantified as a summed concentration, referred to as PCB196

† Significant contributor to the overall mixture effect (>1/number of chemicals in mixture)

Supplemental methods:

Linear mixed-effects models for weight-for-age scores at 0, 2, 9, and 19 months

We explored use of an age^2 term in our mixed models to represent the quadratic nature of childhood growth. Most models with the age^2 term did not converge, and of those that converged, the age^2 term was not significant and therefore not included.

We also examined potential interaction between the EDC concentrations and age at measurement (as a continuous variable (age in months) and as a categorical variable (0, 2, 9, or 19 months)). We did not observe interaction with age at measurement for the vast majority of EDCs under study and therefore did not include interaction terms in our models.

We assessed the need for including a random slope for age at the measurement in the model (**Model 1**). Model fit for the mixed single- and multi-chemical models was improved with the addition of a random slope for age at measurement (as indicated by a smaller AIC fit statistic), but fixed effect estimates did not notably differ from the random intercept only models (**Model 2**). Therefore, for comparison with BKMR models where only a random intercept is possible, we have presented single- and multi-chemical model results from the random intercept only models (**Table 3**).

We explored a variety of covariance structures for the R matrix, including autoregressive(1), compound symmetric, Toeplitz, Toeplitz with two bands, unstructured, and the default structure (variance components). Some correlation structures led to receipt of error messages and lack of convergence (compound symmetric, Toeplitz, and unstructured). Of those that converged (autoregressive(1), Toeplitz with two bands, and the default structure (variance components), models with the Toeplitz with two bands R matrix consistently produced the lowest

AIC, indicating best model fit. Therefore, we used Toeplitz with two bands R matrix in all proc mixed models.

<u>**Model 1:** Random intercept and slope (full) model:</u>

$E(\text{Weight-for-age}_{ij}) = (\beta_0 + b_{0i}) + \beta_1 \text{EDC}_{ij} + \beta_2 \text{MatAge}_{ij} + \beta_3 \text{Edu1}_{ij} + \beta_4 \text{Edu2}_{ij} + \beta_5 \text{Smoke}_{ij} + \beta_6 \text{Parity}_{ij} + \beta_7 \text{BMI}_{ij} + \beta_8 \text{SampleGA}_{ij} + (\beta_9 + b_{9i}) \text{MeasurementAge}_{ij} + e_{ij}$

Weight-for-age: continuous z-score for weight-for-age

EDC (continuous): EDC of interest, measured during the prenatal period (log-transformed continuous variable)

MatAge (continuous): Maternal age at delivery in years

Edu (3-level categorical using dummy variables): Maternal education; classified as <O-level (ordinary level: required, completed at age 16), O-level, or > O-level

Smoke (categorical): Prenatal smoking; any smoking or no smoking

Parity (categorical): Parity; nulliparous or multiparous

BMI (continuous): Pre-pregnancy body mass index (kg/m^2)

SampleGA (categorical): Gestational week at serum sample collection; ≤20 weeks or >20 weeks

MeasurementAge (continuous): Age at anthropometric measurement in months

where b_{0i} represents the random intercept for subject i, and where b_{9i} represents a random slope for the variable MeasurementAge for subject i, $b_{0i} \sim N(0, \sigma_s^2)$ and $b_{9i} \sim N(0, \sigma_M^2)$

j=1, 2, 3, 4

i=1,2,…n

e_{ij} =errors, assumed to be $N(0, \sigma^2)$ …

Model 2: Random intercept (final) model:

$E(\text{Weight-for-age}_{ij}) = (\beta_0 + b_{0i}) + \beta_1 \text{EDC}_{ij} + \beta_2 \text{MatAge}_{ij} + \beta_3 \text{Edu1}_{ij} + \beta_4 \text{Edu2}_{ij} + \beta_5 \text{Smoke}_{ij} + \beta_6 \text{Parity}_{ij} + \beta_7 \text{BMI}_{ij} + \beta_8 \text{SampleGA}_{ij} + \beta_9 \text{MeasurementAge}_{ij} + e_{ij}$

Weight-for-age: continuous z-score for weight-for-age

EDC (continuous): EDC of interest, measured during the prenatal period

MatAge (continuous): Maternal age at delivery in years

Edu (3-level categorical using dummy variables): Maternal education; classified as <O-level (ordinary level: required, completed at age 16), O-level, or > O-level

Smoke (categorical): Prenatal smoking; any smoking or no smoking

Parity (categorical): Parity; nulliparous or multiparous

BMI (continuous): Pre-pregnancy body mass index (kg/m^2)

SampleGA (categorical): Gestational week at serum sample collection; ≤20 weeks or >20 weeks

MeasurementAge (continuous): Age at anthropometric measurement in months

where b_{0i} represents the random intercept for subject i, $b_{0i} \sim N(0, \sigma_s^2)$

j=1, 2, 3, 4

i=1, 2,....n

e_{ij} = errors, assumed to be $N(0, \sigma^2)$

Sensitivity analyses results

In sensitivity analyses, we used BKMR to model the mixture of all three classes combined in relation to weight-for-age scores at 2, 9, and 19 months (excluding birth weight measures) using a random intercept (**Figure S3**). Excluding weight at birth from the analysis showed attenuation of the inverse association seen in **Figure 3A** (estimate for 75th percentile compared to the 25th percentile: -0.07 (95% credible interval: -0.20, 0.06) versus -0.27 (95% credible interval: -0.42, -0.11)). As in the model including birth weight, PCBs and OCPs had the highest PIPs (PIP_{PCBs}: 0.58 and PIP_{OCPs}: 0.57). Within the PCB class, PCB118 contributed the most to the model (conditional PIP: 0.16) and within the OCP class, p,p'-DDE (conditional PIP: 0.33) contributed the most. Similar to the model including birth weight measures, the most important PFAS was PFOS (conditional PIP: 0.23).

Further, we conducted a sensitivity analysis using BKMR with a random intercept to examine the mixture of 31 chemicals with weight-for-age scores adjusted for gestational age at birth (n=301). Adjustment of the weight-for-age z-scores for gestational age at birth had minimal impact on the overall effect estimates. Holding all persistent EDCs at the 75th percentile compared to the 25th percentile was associated with 0.20 lower weight-for-age z-score (estimate: -0.20, 95% credible interval: -0.34, -0.07), compared to a 0.27 lower weight-for-age z-score (estimate: -0.27, 95% credible interval: -0.42, -0.11) in models not adjusting for gestational age.