

Cover Page for Supporting Information

Manuscript title: POLYBROMINATED DIPHENYL ETHERS, POLYCHLORINATED BIPHENYLS AND PERSISTENT PESTICIDES IN SERUM FROM THE NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY: 2003 – 2008

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Table S1. Number of serum pools created by race/ethnicity, age group, sex, and survey period. Eight samples were included in each pool except where noted.

Race/Ethnicity	Age (Years)	Number of serum pools			
		NHANES 2005/06		NHANES 2007/08	
		Females	Males	Females	Males
Mexican American (MA)	12-19	16	11	5 ¹	6
	20-39	9	9	8	9 ¹
	40-59	6	4	6 ²	6
	≥60	3	4	5 ³	5 ¹
Non-Hispanic Black (NHB)	12-19	14	13	5 ⁴	6 ⁴
	20-39	7	6	8 ⁵	6
	40-59	7	5	8 ⁵	6
	≥60	5	5	7 ¹	8
Non-Hispanic White (NHW)	12-19	10	9	7 ⁴	6
	20-39	16	12	13 ²	15
	40-59	13	12	17	16
	≥60	17	15	21	23
Other	All	9 ⁶		10 ⁷	

¹ One six sample pool. ² One 3 sample pool. ³ One 7 sample pool. ⁴ One 5 sample pool. ⁵ One 4 sample pool. ⁶ One 6 sample pool and one 7 sample pool. ⁷ Two 5 sample pools and one 7 sample pool.

Table S2. International Union of Pure and Applied Chemistry (IUPAC) name and common abbreviation for persistent organic pollutants measured in NHANES 2003/04 (Individual samples) and NHANES 2005/06 and 2007/08 (pooled samples). Median concentration (pg/g serum) detectable in blank samples and limit of detection for NHANES 2005/06 and 2007/08.

IUPAC Name	Abbreviation	Median conc. (pg/g serum) in method blanks		Limit of Detection (pg/g serum)	
		NHANES 2005/06	NHANES 2007/08	NHANES 2005/06	NHANES 2007/08
<i>Brominated Flame Retardants (BFRs)</i>	<i>Polybrominated Diphenyl Ethers (PBDEs)</i>				
2,2',4-Tribromodiphenyl ether	PBDE17	0	0	2.5 ¹	2.5 ¹
2,4,4'-Tribromodiphenyl ether	PBDE28	0	0	2.5 ¹	2.5 ¹
2,2',4,4'-Tetrabromodiphenyl ether	PBDE47	5.8	5.4	6.7 ²	2.5 ¹
2,3',4,4'-Tetrabromodiphenyl ether	PBDE66	0	0	2.5 ¹	2.5 ¹
2,2',3,4,4'-Pentabromodiphenyl ether	PBDE85	0	0	2.5 ¹	2.5 ¹
2,2',4,4',5-Pentabromodiphenyl ether	PBDE99	4.5	4	4.8 ²	2.5 ¹
2,2',4,4',6-Pentabromodiphenyl ether	PBDE100	0	0	2.5 ¹	2.5 ¹
2,2',4,4',5,5'-Hexabromodiphenyl ether	PBDE153	0	0	2.5 ¹	2.5 ¹
2,2',4,4',5,6'-Hexabromodiphenyl ether	PBDE154	0	0	2.5 ¹	2.5 ¹
2,2',3,4,4',5',6-Heptabromodiphenyl ether	PBDE183	0	0	2.5 ¹	2.5 ¹
Decabromodiphenyl ether	PBDE209	6.9	0	25 ¹	25 ¹
2,2',4,4',5,5'-Hexabromobiphenyl	PBB153	0	0	2.5 ¹	2.5 ¹
<i>Persistent Pesticides</i>	<i>Persistent Pesticides</i>				
p,p'-Dichlorodiphenyldichloroethylene	p,p'-DDE	16.5	4.6	33.0 ²	6.2 ¹
o,p'-Dichlorodiphenyltrichloroethane	o,p'-DDT	0	0	6.2 ¹	6.2 ¹
p,p'-Dichlorodiphenyltrichloroethane	p,p'-DDT	0	0	6.2 ¹	6.2 ¹
Hexachlorobenzene	HCB	37.8	8.4	17.1 ²	6.2 ¹
β-Hexachlorocyclohexane	β-HCCH	0	0	6.2 ¹	6.2 ¹
γ-Hexachlorocyclohexane	γ-HCCH	0	0	6.2 ¹	6.2 ¹

Mirex	MIREX	0	0	6.2 ¹	6.2 ¹
trans-Nonachlor	T-NONA	2.6	0	6.3 ²	6.2 ¹
Oxychlorane	OXYCHLOR	0	0	6.2 ¹	6.2 ¹

Polychlorinated Biphenyls (PCBs)

Polychlorinated Biphenyls (PCBs)

2,4,4'-Trichlorobiphenyl	PCB28	21.1	1.7	10.4 ²	3.1 ²
2,2',3,5'-Tetrachlorobiphenyl	PCB44	1.3	0	1.5 ²	1.2 ¹
2,2',4,5'-Tetrachlorobiphenyl	PCB49	1.2	0	1.2 ¹	1.2 ¹
2,2',5,5'-Tetrachlorobiphenyl	PCB52	2.3	0.5	1.4 ²	1.2 ¹
2,3',4,4'-Tetrachlorobiphenyl	PCB66	1.6	0	1.7 ²	1.2 ¹
2,4,4',5-Tetrachlorobiphenyl	PCB74	0	1.5	1.2 ¹	3.6 ²
2,2',3,4,5'-Pentachlorobiphenyl	PCB87	0	0	1.2 ¹	1.2 ¹
2,2',4,4',5-Pentachlorobiphenyl	PCB99	0	0	1.2 ¹	1.2 ¹
2,2',4,5,5'-Pentachlorobiphenyl	PCB101	1.1	0	2.4 ²	1.2 ¹
2,3,3',4,4'-Pentachlorobiphenyl	PCB105	0	0	1.2 ¹	1.2 ¹
2,3,3',4',6-Pentachlorobiphenyl	PCB110	0.8	0	1.2 ¹	1.2 ¹
2,3,4,4',5-Pentachlorobiphenyl	PCB114	0	0	1.2 ¹	1.2 ¹
2,3',4,4',5-Pentachlorobiphenyl	PCB118	1	0	2.9 ²	1.2 ¹
2,3',4,4',5'-Pentachlorobiphenyl	PCB123	0	0	1.2 ¹	1.2 ¹
2,2',3,3',4,4'-Hexachlorobiphenyl	PCB128	0	0	1.2 ¹	1.2 ¹
2,2',3,4,4',5'- and 2,3,3',4,4',6-Hexachlorobiphenyl	PCB138-158	0	0	1.2 ¹	1.2 ¹
2,2',3,4',5,5'-Hexachlorobiphenyl	PCB146	0	0	1.2 ¹	1.2 ¹
2,2',3,4',5',6-Hexachlorobiphenyl	PCB149	0	0	1.2 ¹	1.2 ¹
2,2',3,5,5',6-Hexachlorobiphenyl	PCB151	0	0	1.2 ¹	1.2 ¹
2,2',4,4',5,5'-Hexachlorobiphenyl	PCB153	1.4	0	1.3 ²	1.2 ¹
2,3,3',4,4',5-Hexachlorobiphenyl	PCB156	0	0	1.2 ¹	1.2 ¹
2,3,3',4,4',5'-Hexachlorobiphenyl	PCB157	0	0	1.2 ¹	1.2 ¹
2,3',4,4',5,5'-Hexachlorobiphenyl	PCB167	0	0	1.2 ¹	1.2 ¹
2,2',3,3',4,4',5-Heptachlorobiphenyl	PCB170	0	0	1.2 ¹	1.2 ¹
2,2',3,3',4,5,5'-Heptachlorobiphenyl	PCB172	0	0	1.2 ¹	1.2 ¹
2,2',3,3',4',5,6-Heptachlorobiphenyl	PCB177	0	0	1.2 ¹	1.2 ¹
2,2',3,3',5,5',6-Heptachlorobiphenyl	PCB178	0	0	1.2 ¹	1.2 ¹

2,2',3,4,4',5,5'-Heptachlorobiphenyl	PCB180	0	0	1.2 ¹	1.2 ¹
2,2',3,4,4',5',6-Heptachlorobiphenyl	PCB183	0	0	1.2 ¹	1.2 ¹
2,2',3,4',5,5',6-Heptachlorobiphenyl	PCB187	0	0	1.2 ¹	1.2 ¹
2,3,3',4,4',5,5'-Heptachlorobiphenyl	PCB189	0	0	1.2 ¹	1.2 ¹
2,2',3,3',4,4',5,5'-Octachlorobiphenyl	PCB194	0	0	1.2 ¹	1.2 ¹
2,2',3,3',4,4',5,6-Octachlorobiphenyl	PCB195	0	0	1.2 ¹	1.2 ¹
2,2',3,3',4,4',5,6'- and 2,2',3,4,4',5,5',6-Octachlorobiphenyl	PCB196-203	0	0	1.2 ¹	1.2 ¹
2,2',3,3',4,5,6,6'-Octachlorobiphenyl	PCB199	0	0	1.2 ¹	1.2 ¹
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	PCB206	0	0	1.2 ¹	1.2 ¹
Decachlorobiphenyl	PCB209	0	0	1.2 ¹	1.2 ¹

¹ Instrumental limit of detection defined as signal to noise greater than 3. ² Limit of detection defined as three times the standard deviation of method blanks analyzed in parallel with unknown samples.

Table S3. International Union of Pure and Applied Chemistry (IUPAC) name and common abbreviation for persistent organic pollutants detectable in over 50% of any demographic group (sex, age, race ethnicity) NHANES pooled serum samples.

IUPAC Name and Common Abbreviation	Detection Frequency (%)	
	NHANES 2005/06	NHANES 2007/08
	Mean (Range)	Mean (Range)
<i>Polybrominated Diphenyl Ethers</i>		
2,4,4'-Tribromodiphenyl ether (PBDE28)	97.7 (80 - 100)	100
2,2',4,4'-Tetrabromodiphenyl ether (PBDE47)	100	100
2,2',3,4,4'-Tentabromodiphenyl ether (PBDE85)	84.9 (53.8 - 100)	82.9 (58.8 - 100)
2,2',4,4',5'-Pentabromodiphenyl ether (PBDE99)	100	100
2,2',4,4',6'-Pentabromodiphenyl ether (PBDE100)	100	100
2,2',4,4',5,5'-Hexabromodiphenyl ether (PBDE153)	100	100
<i>Polychlorinated Biphenyls</i>		
2,4,4',5-Tetrachlorobiphenyl (PCB74)	98.5 (85.7 - 100)	97.7 (80 - 100)
2,2',4,4',5-Pentachlorobiphenyl (PCB99)	99.6 (90.9 - 100)	98.7 (83.3 - 100)
2,3',4,4',5-Pentachlorobiphenyl (PCB118)	100	99.2 (80 - 100)
2,2',3,4,4',5'- and 2,3,3',4,4',6-Hexachlorobiphenyl (PCB138-158)	99.7 (93.8 - 100)	99.3 (83.3 - 100)
2,2',4,4',5,5'-Hexachlorobiphenyl (PCB153)	100	99.3 (83.3 - 100)
2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB180)	99.4 (90.9 - 100)	100
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (PCB194)	93.8 (64.3 - 100)	91.4 (60 - 100)
<i>Persistent Pesticides</i>		
Hexachlorobenzene (HCB)	99.1 (85.7 - 100)	100
2,2-Bis(4-chlorophenyl)-1,1-dichloroethene (PP-DDE)	100	100

Table S7. Arithmetic mean concentration (ng/g lipid) of 2,4,4',5-tetrachlorobiphenyl (PCB74) and 2,2',4,4',5-pentachlorobiphenyl (PCB99) in pooled serum samples from NHANES participants by age group, survey period, ethnicity, and sex with 95% confidence interval (95%CI). All pairwise comparisons between each ethnic group within each sex group and between each sex within ethnic group have been given. ↑ indicates significant higher concentration compared with comparison group (non-overlap of 95%CI).

Age Group	Survey Period	Concentration (ng/g lipid) with 95%CI by ethnicity and gender						Which of two comparison groups are higher. No difference denoted with "---"								
		MA		NHB		NHW		Overlap of 95% CI for Females			Overlap of 95% CI for Males			Overlap of 95% CI by Gender		
		Females	Males	Females	Males	Females	Males	MA/NHB	MA/NHW	NHB/NHW	MA/NHB	MA/NHW	NHB/NHW	MA	NHB	NHW
2,4,4',5-Tetrachlorobiphenyl (PCB74)																
12-19	2003-04	2.0 ± 0.4	1.9 ± 0.2	2.2 ± 0.4	2.9 ± 0.3	2.6 ± 0.6	2.6 ± 0.4	---	---	---	NHB ↑	NHW ↑	---	---	Males ↑	---
	2005-06	1.1 ± 0.3	1.2 ± 0.3	1.3 ± 0.6	2.0 ± 0.3	1.8 ± 0.4	1.8 ± 0.4	---	NHW ↑	---	NHB ↑	---	---	---	---	---
	2007-08	0.8 ± 0.3	1.0 ± 0.3	1.0 ± 0.6	1.4 ± 0.5	1.7 ± 0.3	1.7 ± 0.8	---	NHW ↑	---	---	---	---	---	---	---
20-39	2003-04	2.3 ± 0.4	1.9 ± 0.3	3.8 ± 0.8	2.6 ± 0.4	3.9 ± 0.6	3.1 ± 0.3	NHB ↑	NHW ↑	---	---	NHW ↑	---	---	Females ↑	---
	2005-06	1.5 ± 0.5	1.6 ± 0.2	2.9 ± 0.9	2.3 ± 0.8	2.6 ± 0.5	2.6 ± 0.9	NHB ↑	NHW ↑	---	---	---	---	---	---	---
	2007-08	1.6 ± 0.4	1.6 ± 0.3	1.8 ± 0.4	1.8 ± 0.4	2.4 ± 0.8	2.2 ± 0.2	---	---	---	---	NHW ↑	---	---	---	---
40-59	2003-04	6.4 ± 3.5	4.3 ± 0.9	11.2 ± 1.6	7.3 ± 4.2	8.0 ± 0.7	6.6 ± 1.2	---	---	NHB ↑	---	NHW ↑	---	---	---	---
	2005-06	4.3 ± 0.9	2.9 ± 0.8	8.7 ± 1.9	4.5 ± 2.2	7.2 ± 0.9	5.3 ± 0.9	NHB ↑	NHW ↑	---	---	NHW ↑	---	---	Females ↑	Females ↑
	2007-08	4.7 ± 1.8	3.1 ± 0.6	8.0 ± 2.3	4.4 ± 2.6	6.3 ± 0.8	4.1 ± 0.6	---	---	---	---	---	---	---	---	Females ↑
≥60	2003-04	13.9 ± 2.8	6.2 ± 1.5	38.3 ± 9.1	26.2 ± 11.0	20.0 ± 3.2	12.2 ± 1.5	NHB ↑	NHW ↑	NHB ↑	NHB ↑	NHW ↑	NHB ↑	Females ↑	---	Females ↑
	2005-06	11.9 ± 5.4	6.4 ± 1.9	36.0 ± 21.6	16.5 ± 6.5	17.8 ± 3.5	11.7 ± 2.5	---	---	---	NHB ↑	NHW ↑	---	---	---	Females ↑
	2007-08	9.7 ± 3.8	6.5 ± 2.0	21.5 ± 4.3	11.5 ± 3.2	15.8 ± 2.2	10.5 ± 1.8	NHB ↑	NHW ↑	---	---	NHW ↑	---	---	Females ↑	Females ↑
2,2',4,4',5-Pentachlorobiphenyl (PCB99)																
12-19	2003-04	2.0 ± 0.4	2.1 ± 0.2	2.7 ± 0.6	3.4 ± 0.4	2.9 ± 0.6	2.8 ± 0.8	---	---	---	NHB ↑	---	---	---	---	---
	2005-06	0.8 ± 0.1	0.9 ± 0.2	1.4 ± 0.3	2.1 ± 0.5	1.3 ± 0.2	1.5 ± 0.7	NHB ↑	NHW ↑	---	NHB ↑	---	---	---	---	---
	2007-08	0.7 ± 0.2	0.8 ± 0.3	1.2 ± 0.7	1.4 ± 0.3	0.9 ± 0.6	1.5 ± 0.7	---	---	---	---	---	---	---	---	---
20-39	2003-04	2.1 ± 0.4	2.3 ± 0.4	4.9 ± 1.4	3.9 ± 0.9	3.5 ± 0.8	3.6 ± 0.5	NHB ↑	NHW ↑	---	NHB ↑	NHW ↑	---	---	---	---
	2005-06	1.1 ± 0.4	1.5 ± 0.3	2.4 ± 0.7	2.5 ± 0.6	1.9 ± 0.4	2.6 ± 0.8	NHB ↑	---	---	NHB ↑	NHW ↑	---	---	---	---
	2007-08	1.3 ± 0.2	1.5 ± 0.4	1.9 ± 0.7	2.2 ± 0.5	2.1 ± 1.2	2.3 ± 0.4	---	---	---	---	NHW ↑	---	---	---	---
40-59	2003-04	5.4 ± 3.9	3.8 ± 0.7	10.7 ± 2.1	8.7 ± 3.1	6.4 ± 1.1	6.7 ± 1.7	---	---	NHB ↑	NHB ↑	NHW ↑	---	---	---	---
	2005-06	3.3 ± 0.8	2.4 ± 0.5	7.6 ± 1.8	5.5 ± 2.2	4.5 ± 0.7	4.3 ± 0.9	NHB ↑	---	NHB ↑	NHB ↑	NHW ↑	---	---	---	---
	2007-08	2.7 ± 0.6	3.2 ± 1.3	6.4 ± 1.7	6.2 ± 3.2	3.9 ± 0.6	3.8 ± 0.7	NHB ↑	---	NHB ↑	---	---	---	---	---	---
≥60	2003-04	7.0 ± 0.8	5.0 ± 0.9	31.5 ± 7.4	25.2 ± 13.4	12.7 ± 4.6	8.5 ± 1.8	NHB ↑	NHW ↑	NHB ↑	NHB ↑	NHW ↑	NHB ↑	Females ↑	---	---
	2005-06	5.7 ± 1.8	4.2 ± 0.8	21.5 ± 13.3	14.2 ± 5.7	10.0 ± 1.9	8.0 ± 1.6	NHB ↑	NHW ↑	---	NHB ↑	NHW ↑	---	---	---	---
	2007-08	5.2 ± 1.6	4.5 ± 1.0	17.9 ± 6.0	11.5 ± 3.1	8.8 ± 1.7	8.5 ± 2.3	NHB ↑	NHW ↑	NHB ↑	NHB ↑	NHW ↑	---	---	---	---

Table S8. Arithmetic mean concentration (ng/g lipid) of 2,3',4,4',5-pentachlorobiphenyl (PCB118) and 2,2',3,4,4',5- and 2,3,3',4,4',6-hexachlorobiphenyl (PCB138-158) in pooled serum samples from NHANES participants by age group, survey period, ethnicity, and sex with 95% confidence interval (95%CI). All pairwise comparisons between each ethnic group within each sex group and between each sex within ethnic group have been given. ↑ indicates significant higher concentration compared with comparison group (non-overlap of 95%CI).

Age Group	Survey Period	Concentration (ng/g lipid) with 95%CI by ethnicity and gender						Which of two comparison groups are higher. No difference denoted with "---"								
		MA		NHB		NHW		Overlap of 95% CI for Females			Overlap of 95% CI for Males			Overlap of 95% CI by Gender		
		Females	Males	Females	Males	Females	Males	MA/NHB	MA/NHW	NHB/NHW	MA/NHB	MA/NHW	NHB/NHW	MA	NHB	NHW
2,3',4,4',5-Pentachlorobiphenyl (PCB118)																
12-19	2003-04	2.7 ± 0.5	2.6 ± 0.3	3.6 ± 1.0	3.9 ± 0.5	4.0 ± 1.1	3.6 ± 0.9	---	---	---	NHB ↑	---	---	---	---	---
	2005-06	1.4 ± 0.2	1.5 ± 0.2	2.0 ± 0.4	2.5 ± 0.5	2.1 ± 0.4	2.2 ± 1.1	NHB ↑	NHW ↑	---	NHB ↑	---	---	---	---	---
	2007-08	1.2 ± 1.1	1.5 ± 0.4	1.9 ± 1.0	2.0 ± 0.5	2.4 ± 0.7	2.3 ± 1.3	---	---	---	---	---	---	---	---	---
20-39	2003-04	3.3 ± 0.6	3.0 ± 0.6	5.9 ± 1.5	4.2 ± 1.4	5.2 ± 1.1	4.8 ± 1.1	NHB ↑	NHW ↑	---	---	NHW ↑	---	---	---	---
	2005-06	1.9 ± 0.6	2.2 ± 0.4	3.7 ± 1.4	2.6 ± 1.5	3.0 ± 0.6	3.3 ± 1.5	---	---	---	---	---	---	---	---	---
	2007-08	2.5 ± 0.5	2.7 ± 0.6	3.4 ± 0.9	2.8 ± 1.1	4.2 ± 2.0	3.3 ± 0.5	---	---	---	---	---	---	---	---	---
40-59	2003-04	11.7 ± 9.3	6.7 ± 1.3	15.6 ± 2.4	14.1 ± 12.3	9.9 ± 2.3	8.6 ± 2.3	---	---	NHB ↑	---	---	---	---	---	---
	2005-06	6.8 ± 1.6	4.1 ± 0.8	11.7 ± 1.9	7.3 ± 6.9	7.8 ± 2.1	7.6 ± 2.8	NHB ↑	---	---	---	---	---	Females ↑	---	---
	2007-08	6.1 ± 2.0	6.0 ± 1.7	11.2 ± 2.8	7.3 ± 4.7	7.6 ± 1.9	5.2 ± 0.4	NHB ↑	---	---	---	---	---	---	---	Females ↑
≥60	2003-04	17.8 ± 2.0	9.0 ± 3.4	56.4 ± 15.1	32.5 ± 15.2	26.6 ± 6.9	14.7 ± 2.9	NHB ↑	---	NHB ↑	NHB ↑	---	---	Females ↑	---	Females ↑
	2005-06	15.3 ± 6.7	8.1 ± 2.7	45.0 ± 28.0	19.9 ± 10.6	21.9 ± 4.4	13.3 ± 3.4	---	---	---	---	---	---	---	---	Females ↑
	2007-08	14.0 ± 3.9	8.7 ± 1.9	35.1 ± 9.1	16.1 ± 4.3	21.5 ± 6.0	15.5 ± 3.6	NHB ↑	---	---	NHB ↑	NHW ↑	---	---	Females ↑	---
2,2',3,4,4',5'- and 2,3,3',4,4',6-Hexachlorobiphenyl (PCB138-158)																
12-19	2003-04	3.8 ± 0.5	4.6 ± 0.8	6.2 ± 1.3	7.7 ± 1.1	6.3 ± 1.6	6.5 ± 1.7	NHB ↑	NHW ↑	---	NHB ↑	---	---	---	---	---
	2005-06	1.9 ± 0.4	2.7 ± 1.0	3.0 ± 0.5	4.8 ± 1.2	3.2 ± 0.8	4.1 ± 2.0	NHB ↑	NHW ↑	---	---	---	---	---	Males ↑	---
	2007-08	1.8 ± 1.5	2.6 ± 1.8	3.3 ± 1.6	4.6 ± 1.5	3.5 ± 2.0	4.8 ± 3.0	---	---	---	---	---	---	---	---	---
20-39	2003-04	5.6 ± 1.2	7.1 ± 1.8	12.5 ± 3.5	12.4 ± 4.8	11.4 ± 3.1	13.5 ± 2.8	NHB ↑	NHW ↑	---	---	NHW ↑	---	---	---	---
	2005-06	3.2 ± 1.1	4.5 ± 0.8	6.9 ± 2.5	7.7 ± 3.4	5.2 ± 0.9	8.0 ± 2.9	NHB ↑	---	---	---	---	---	---	---	---
	2007-08	4.4 ± 0.6	5.7 ± 1.5	7.2 ± 2.5	7.9 ± 2.3	7.9 ± 4.4	8.7 ± 1.6	---	---	---	---	---	---	---	---	---
40-59	2003-04	20.2 ± 10.4	18.6 ± 4.2	42.9 ± 9.7	41.3 ± 17.8	25.8 ± 3.3	28.4 ± 7.0	NHB ↑	---	NHB ↑	NHB ↑	---	---	---	---	---
	2005-06	12.5 ± 2.3	9.7 ± 1.6	25.5 ± 6.4	20.9 ± 8.4	16.5 ± 2.5	19.6 ± 6.9	NHB ↑	---	NHB ↑	NHB ↑	NHW ↑	---	---	---	---
	2007-08	14.6 ± 4.2	15.2 ± 4.5	28.2 ± 7.0	28.6 ± 14.5	21.5 ± 2.4	20.7 ± 4.3	NHB ↑	NHW ↑	---	---	---	---	---	---	---
≥60	2003-04	30.9 ± 7.6	26.6 ± 4.2	115.4 ± 24.7	108.0 ± 42.3	48.6 ± 7.6	46.1 ± 9.2	NHB ↑	NHW ↑	NHB ↑	NHB ↑	NHW ↑	NHB ↑	---	---	---
	2005-06	21.7 ± 11.9	19.6 ± 7.2	81.1 ± 58.7	56.5 ± 23.9	33.5 ± 6.1	32.6 ± 3.5	---	---	---	NHB ↑	NHW ↑	---	---	---	---
	2007-08	25.6 ± 13.1	23.9 ± 6.9	79.9 ± 15.5	68.2 ± 21.6	45.0 ± 6.4	47.5 ± 9.1	NHB ↑	---	NHB ↑	NHB ↑	NHW ↑	---	---	---	---

Table S9. Arithmetic mean concentration (ng/g lipid) of 2,2',4,4',5,5'-hexachlorobiphenyl (PCB153) and 2,2',3,4,4',5,5'-heptachlorobiphenyl (PCB180) in pooled serum samples from NHANES participants by age group, survey period, ethnicity, and sex with 95% confidence interval (95%CI). All pairwise comparisons between each ethnic group within each sex group and between each sex within ethnic group have been given. ↑ indicates significant higher concentration compared with comparison group (non-overlap of 95%CI).

Age Group	Survey Period	Concentration (ng/g lipid) with 95%CI by ethnicity and gender						Which of two comparison groups are higher. No difference denoted with "---"								
		MA		NHB		NHW		Overlap of 95% CI for Females			Overlap of 95% CI for Males			Overlap of 95% CI by Gender		
		Females	Males	Females	Males	Females	Males	MA/NHB	MA/NHW	NHB/NHW	MA/NHB	MA/NHW	NHB/NHW	MA	NHB	NHW
2,2',4,4',5,5'-Hexachlorobiphenyl (PCB153)																
12-19	2003-04	4.4 ± 0.5	5.7 ± 1.1	7.2 ± 1.5	9.7 ± 1.5	7.4 ± 2.3	8.6 ± 2.1	NHB ↑	NHW ↑	---	NHB ↑	---	---	---	---	---
	2005-06	2.8 ± 0.4	3.7 ± 1.1	4.2 ± 0.8	7.4 ± 1.8	4.6 ± 1.3	6.3 ± 2.7	NHB ↑	NHW ↑	---	NHB ↑	---	---	---	Males ↑	---
	2007-08	2.9 ± 3.3	3.3 ± 2.0	3.8 ± 1.8	5.7 ± 1.8	4.3 ± 2.9	5.8 ± 2.8	---	---	---	---	---	---	---	---	---
20-39	2003-04	6.6 ± 1.4	8.9 ± 2.0	15.3 ± 4.4	16.7 ± 7.3	14.4 ± 3.8	17.6 ± 3.9	NHB ↑	NHW ↑	---	---	NHW ↑	---	---	---	---
	2005-06	4.7 ± 1.9	6.9 ± 0.9	10.8 ± 4.1	13.8 ± 6.6	8.5 ± 1.9	13.2 ± 5.4	NHB ↑	---	---	---	NHW ↑	---	---	---	---
	2007-08	5.6 ± 1.2	6.8 ± 1.7	9.0 ± 3.2	10.3 ± 2.9	9.4 ± 4.6	11.0 ± 2.1	---	---	---	---	NHW ↑	---	---	---	---
40-59	2003-04	23.7 ± 10.5	26.5 ± 7.3	53.2 ± 11.9	59.9 ± 27.2	34.2 ± 3.5	38.2 ± 9.4	NHB ↑	---	NHB ↑	---	---	---	---	---	---
	2005-06	19.1 ± 3.3	16.5 ± 2.6	41.2 ± 10.1	38.8 ± 15.3	27.8 ± 2.5	36.4 ± 16.4	NHB ↑	NHW ↑	NHB ↑	NHB ↑	NHW ↑	---	---	---	---
	2007-08	20.9 ± 6.0	22.4 ± 6.1	35.7 ± 8.0	41.0 ± 18.6	27.7 ± 2.3	28.2 ± 4.8	NHB ↑	---	---	---	---	---	---	---	---
≥60	2003-04	39.5 ± 11.4	36.7 ± 5.5	146.5 ± 27.7	153.0 ± 53.6	62.1 ± 7.8	65.0 ± 11.0	NHB ↑	NHW ↑	NHB ↑	NHB ↑	NHW ↑	NHB ↑	---	---	---
	2005-06	36.2 ± 9.3	37.3 ± 16.8	129.5 ± 74.8	103.5 ± 40.9	58.0 ± 10.8	60.4 ± 6.2	NHB ↑	NHW ↑	---	NHB ↑	---	---	---	---	---
	2007-08	40.9 ± 32.1	39.5 ± 8.9	102.4 ± 15.6	94.5 ± 29.3	56.4 ± 7.8	63.9 ± 10.6	NHB ↑	---	NHB ↑	NHB ↑	NHW ↑	---	---	---	---
2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB180)																
12-19	2003-04	2.7 ± 0.6	3.6 ± 1.1	4.0 ± 0.7	5.5 ± 1.3	4.5 ± 1.7	6.3 ± 1.8	---	---	---	---	---	---	---	---	---
	2005-06	1.8 ± 0.4	2.0 ± 0.8	2.1 ± 0.3	4.1 ± 1.3	2.7 ± 0.6	4.2 ± 1.4	---	---	---	---	---	---	---	Males ↑	---
	2007-08	2.1 ± 3.9	2.2 ± 1.2	2.0 ± 0.7	3.5 ± 1.8	2.8 ± 2.1	3.5 ± 1.4	---	---	---	---	---	---	---	---	---
20-39	2003-04	4.6 ± 1.3	7.3 ± 2.4	8.8 ± 2.9	12.9 ± 6.2	10.4 ± 2.8	17.7 ± 10.3	NHB ↑	NHW ↑	---	---	---	---	---	---	---
	2005-06	3.4 ± 1.9	5.1 ± 0.7	6.9 ± 3.2	10.5 ± 4.1	6.4 ± 2.2	10.7 ± 6.1	---	---	---	NHB ↑	---	---	---	---	---
	2007-08	3.9 ± 0.7	5.5 ± 1.6	5.7 ± 2.6	7.4 ± 2.6	6.7 ± 2.8	8.4 ± 1.4	---	---	---	---	---	---	---	---	---
40-59	2003-04	16.7 ± 4.1	28.0 ± 11.3	36.6 ± 10.2	50.0 ± 18.6	28.8 ± 3.6	33.4 ± 7.2	NHB ↑	NHW ↑	---	---	---	---	---	---	---
	2005-06	15.5 ± 2.7	15.9 ± 4.2	30.5 ± 10.1	32.8 ± 8.0	22.4 ± 2.5	37.8 ± 24.9	NHB ↑	NHW ↑	---	NHB ↑	---	---	---	---	---
	2007-08	18.2 ± 5.1	20.9 ± 6.6	26.4 ± 7.9	34.2 ± 12.7	22.3 ± 2.2	25.8 ± 3.7	---	---	---	---	---	---	---	---	---
≥60	2003-04	33.7 ± 12.6	39.6 ± 8.4	94.5 ± 19.8	128.6 ± 41.3	50.9 ± 4.6	62.9 ± 10.0	NHB ↑	NHW ↑	NHB ↑	NHB ↑	NHW ↑	NHB ↑	---	---	---
	2005-06	30.9 ± 2.1	39.3 ± 38.4	88.6 ± 47.8	88.0 ± 29.7	48.3 ± 7.9	58.6 ± 9.3	NHB ↑	NHW ↑	---	---	---	---	---	---	---
	2007-08	33.7 ± 29.8	42.0 ± 18.3	73.1 ± 10.2	82.5 ± 29.2	45.7 ± 4.6	57.6 ± 9.0	---	---	NHB ↑	---	---	---	---	---	---

Table S11. Arithmetic mean concentration (ng/g lipid) of hexachlorobenzene (HCB) and 2,2-bis(4-chlorophenyl)-1,1-dichloroethene (p,p'-DDE) in pooled serum samples from NHANES participants by age group, survey period, ethnicity, and sex with 95% confidence interval (95%CI). All pairwise comparisons between each ethnic group within each sex group and between each sex within ethnic group have been given. ↑ indicates significant higher concentration compared with comparison group (non-overlap of 95%CI).

Age Group	Survey Period	Concentration (ng/g lipid) with 95%CI by ethnicity and gender											Which of two comparison groups are higher. No difference denoted with "---"									
		MA		NHB		NHW		Overlap of 95% CI for Females			Overlap of 95% CI for Males			Overlap of 95% CI by Gender								
		Females	Males	Females	Males	Females	Males	MA/NHB	MA/NHW	NHB/NHW	MA/NHB	MA/NHW	NHB/NHW	MA	NHB	NHW						
Hexachlorobenzene (HCB)																						
12-19	2003-04	15.7 ± 2.6	16.8	1.8	12.6	0.9	15.8	2.7	13.1	1.8	15.3	1.9	---	---	---	---	---	---	---	---	---	---
	2005-06	5.9 ± 1.5	6.3	1.0	4.4	0.5	6.4	0.9	5.4	1.0	7.6	3.3	---	---	---	---	---	---	---	---	Males ↑	---
	2007-08	6.8 ± 1.6	9.5	1.8	7.2	1.4	9.7	2.4	7.1	0.7	12.4	2.4	---	---	---	---	---	---	---	---	---	Males ↑
20-39	2003-04	19.6 ± 7.3	14.9	2.2	12.9	0.9	13.4	1.5	14.1	1.0	14.2	1.8	---	---	---	---	---	---	---	---	---	---
	2005-06	9.8 ± 2.5	9.6	5.5	5.9	1.4	5.8	1.0	7.1	0.8	7.3	1.1	MA ↑	---	---	---	---	---	---	---	---	---
	2007-08	10.4 ± 2.3	9.5	1.8	7.0	0.6	9.1	1.6	7.9	0.6	9.5	1.2	MA ↑	---	---	---	---	---	---	---	---	---
40-59	2003-04	23.6 ± 7.0	20.9	4.4	16.4	1.7	16.2	2.6	17.9	1.7	16.3	2.6	---	---	---	---	---	---	---	---	---	---
	2005-06	15.9 ± 3.3	14.0	4.7	9.2	1.4	7.2	1.1	9.3	0.8	8.8	1.0	MA ↑	MA ↑	---	MA ↑	---	---	---	---	---	---
	2007-08	20.6 ± 6.1	20.6	16.5	9.9	1.8	9.6	1.0	10.8	1.1	10.1	0.8	MA ↑	MA ↑	---	---	---	---	---	---	---	---
≥60	2003-04	23.5 ± 2.7	18.9	1.3	25.3	2.2	18.1	2.3	21.4	2.1	18.4	1.4	---	---	---	---	---	---	---	Females ↑	Females ↑	---
	2005-06	19.6 ± 10.3	10.5	3.2	18.1	3.4	10.9	4.7	13.9	2.1	11.1	1.0	---	---	---	---	---	---	---	---	---	---
	2007-08	20.7 ± 4.8	12.1	1.8	15.1	1.9	10.3	1.4	15.1	1.9	11.8	1.1	---	---	---	---	---	---	---	Females ↑	Females ↑	Females ↑
2,2-Bis(4-chlorophenyl)-1,1-dichloroethene (p,p'-DDE)																						
12-19	2003-04	539.2 ± 460.1	570.8 ± 354.4	89.9 ± 18.6	143.4 ± 20.6	113.5 ± 42.1	196.9 ± 115.7	---	---	---	---	---	---	---	---	MA ↑	---	---	---	---	Males ↑	---
	2005-06	463.7 ± 266.1	2454.7 ± 3191.0	81.8 ± 12.5	141.0 ± 28.0	83.6 ± 20.5	112.9 ± 48.2	MA ↑	MA ↑	---	---	---	---	---	---	---	---	---	---	---	Males ↑	---
	2007-08	164.2 ± 100.9	265.2 ± 111.4	63.6 ± 28.0	91.5 ± 13.5	70.2 ± 49.0	86.7 ± 21.2	---	---	---	---	---	---	---	---	MA ↑	MA ↑	---	---	---	---	---
20-39	2003-04	924.4 ± 856.9	678.8 ± 615.5	160.5 ± 37.1	256.0 ± 155.9	138.6 ± 32.0	170.1 ± 55.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2005-06	894.9 ± 619.4	1728.8 ± 1119.0	236.9 ± 259.4	235.6 ± 132.4	101.5 ± 25.0	399.1 ± 1044.4	---	MA ↑	---	---	---	---	---	---	MA ↑	---	---	---	---	---	---
	2007-08	653.1 ± 800.6	1087.7 ± 551.9	105.0 ± 30.1	123.1 ± 27.5	91.8 ± 21.8	112.9 ± 39.8	---	---	---	---	---	---	---	---	MA ↑	MA ↑	---	---	---	---	---
40-59	2003-04	927.4 ± 287.4	2268.6 ± 1359.2	1246.0 ± 677.6	578.6 ± 228.6	411.9 ± 153.7	418.1 ± 236.1	---	MA ↑	NHB ↑	---	---	---	---	---	MA ↑	MA ↑	---	---	---	---	---
	2005-06	1315.4 ± 379.2	2159.1 ± 2503.8	690.7 ± 400.2	453.6 ± 201.5	275.5 ± 133.3	220.1 ± 68.5	---	MA ↑	---	---	---	---	---	---	---	---	---	---	---	---	---
	2007-08	1077.0 ± 415.4	1005.1 ± 356.7	495.3 ± 244.4	332.5 ± 53.2	178.7 ± 43.0	175.5 ± 51.1	---	MA ↑	NHB ↑	---	---	---	---	---	MA ↑	MA ↑	NHB ↑	---	---	---	---
≥60	2003-04	3146.6 ± 798.9	1888.3 ± 344.6	2038.7 ± 669.3	1457.7 ± 628.7	871.7 ± 285.8	715.9 ± 232.8	---	MA ↑	NHB ↑	---	---	---	---	---	MA ↑	---	---	---	Females ↑	---	---
	2005-06	1551.1 ± 517.2	1183.4 ± 749.5	2113.9 ± 980.2	1905.9 ± 1213.6	736.1 ± 257.2	696.0 ± 199.2	---	MA ↑	NHB ↑	---	---	---	---	---	---	---	---	---	---	---	---
	2007-08	2961.5 ± 3213.4	1158.5 ± 369.6	2390.0 ± 768.4	854.0 ± 203.7	521.2 ± 165.3	502.5 ± 165.2	---	---	NHB ↑	---	---	---	---	---	MA ↑	---	---	---	---	Females ↑	---