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Supplemental Material

Polybrominated Diphenyl Ether Exposure and Thyroid Function Tests in North American Adults

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Table S1. Spearman correlation coefficients between PBDE congeners at initial sampling round (47 serum samples).

	BDE-28	BDE-47	BDE-99	BDE-100	BDE-153
BDE-28	1.0	r=0.92 p<0.0001	r=0.88 p<0.0001	r=0.85 p<0.0001	r=0.29 p=0.045
BDE-47		1.0	r=0.97 p<0.0001	r=0.96 p<0.0001	r=0.42 p=0.0033
BDE-99			1.0	r=0.95 p<0.0001	r=0.40 p=0.0054
BDE-100				1.0	r=0.47 p=0.0008
BDE-153					1.0

Abbreviations: p (p-value), r (spearman correlation coefficient)

Table S2. Results from general linear regression models evaluating the association between lipid-standardized PBDEs and thyroid function tests. (51 adults, 137 serum samples).

TFTs	**BDE-28** ***β*** **(95% CI)**	*p*	**BDE-47** ***β*** **(95% CI)**	*p*	**BDE-99** ***β*** **(95% CI)**	*p*	**BDE-100** ***β*** **(95% CI)**	*p*	**BDE-153** ***β*** **(95% CI)**	*p*
TT_4 (µg/dL)										
	-15 (-54, 23)	0.43	-13 (-27, 0.57)	0.06	-34 (-81, 13)	0.16	-48 (-90, -6.7)	0.02	-12 (-31, 6.8)	0.21
TSH ln(µIU/mL)[a]										
	47 (230, 130)	0.62	0.81 (-6.0, 7.6)	0.81	6.1 (-18, 30)	0.61	7.5 (-12, 14)	0.46	5.6 (-3.1, 14)	0.20
fT_4 ln(ng/dL)[a]										
	2.9 (-46, 51)	0.91	-0.57 (-2.3, 1.2)	0.53	-3.7 (-9.8, 2.5)	0.24	2.5 (-2.6, 7.5)	0.33	3.0 (0.87, 5.0)	0.01
TT_3 ln(ng/mL)[a]										
	6.1 (-44, 56)	0.81	0.15 (-1.7, 1.9)	0.87	1.4 (-5.3, 8.0)	0.68	-1.3 (-6.4, 3.8)	0.62	-1.5 (-3.7, 0.70)	0.18

Abbreviations: β (beta-estimate), CI (confidence interval), fT_4 (free thyroxine), p (p-value), TFTs (thyroid function tests), TT_3 (total triiodothyronine), TT_4 (total thyroxine), TSH (thyroid stimulating hormone)

a Dependent variable was natural log-transformed for regression analysis.

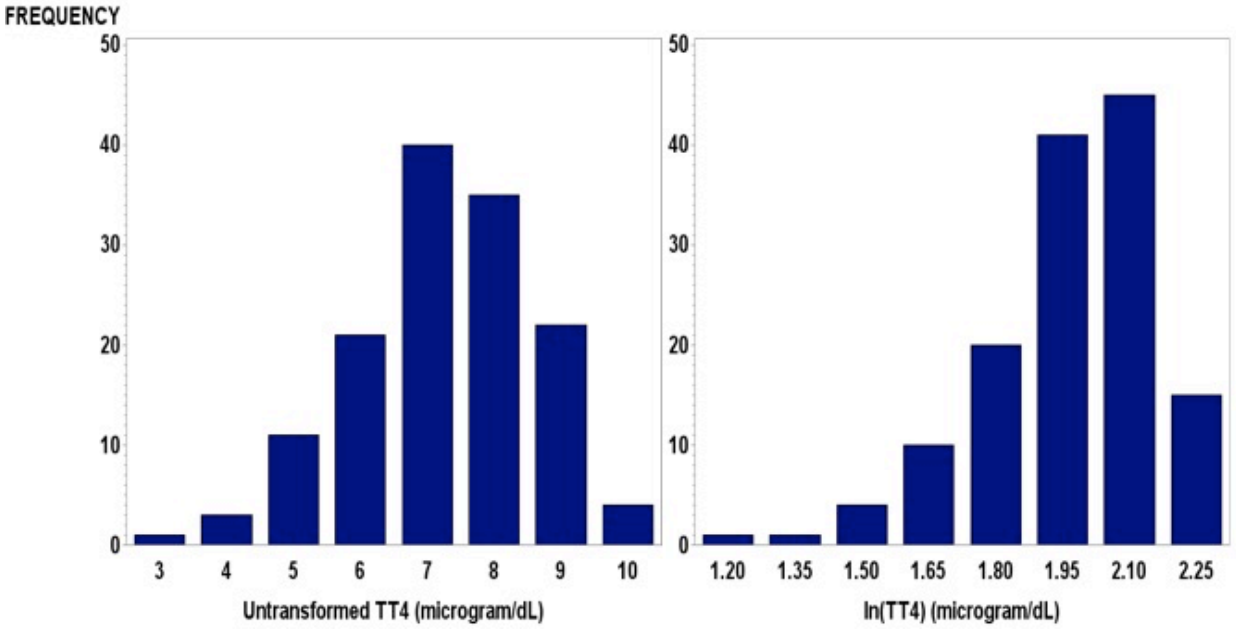
Table S3. Estimated ICCs and variance components for repeated serum markers of thyroid function tests.

Metrics	TSH (μIU/mL) Estimate (95% CI)	TT_4 Estimate (95% CI)	fT_4 Estimate (95% CI)	TT_3 Estimate (95% CI)	UIC Estimate (95% CI)
ICC	0.72 (0.56, 0.78)	0.80 (0.68, 0.85)	0.69 (0.53. 0.77)	0.56 (0.39, 0.67)	0.38 (0.19, 0.50)
σ^2_W	0.11 (0.09, 0.2)	0.36 (0.3, 0.5)	0.0075 (0.006, 0.01)	0.012 (0.009, 0.02)	0.38 (0.29, 0.53)
σ^2_B	0.28 (0.2, 04)	1.4 (0.8, 2.0)	0.017 (0.009, 0.03)	0.015 (0.007, 0.03)	0.23 (0.077, 0.38)

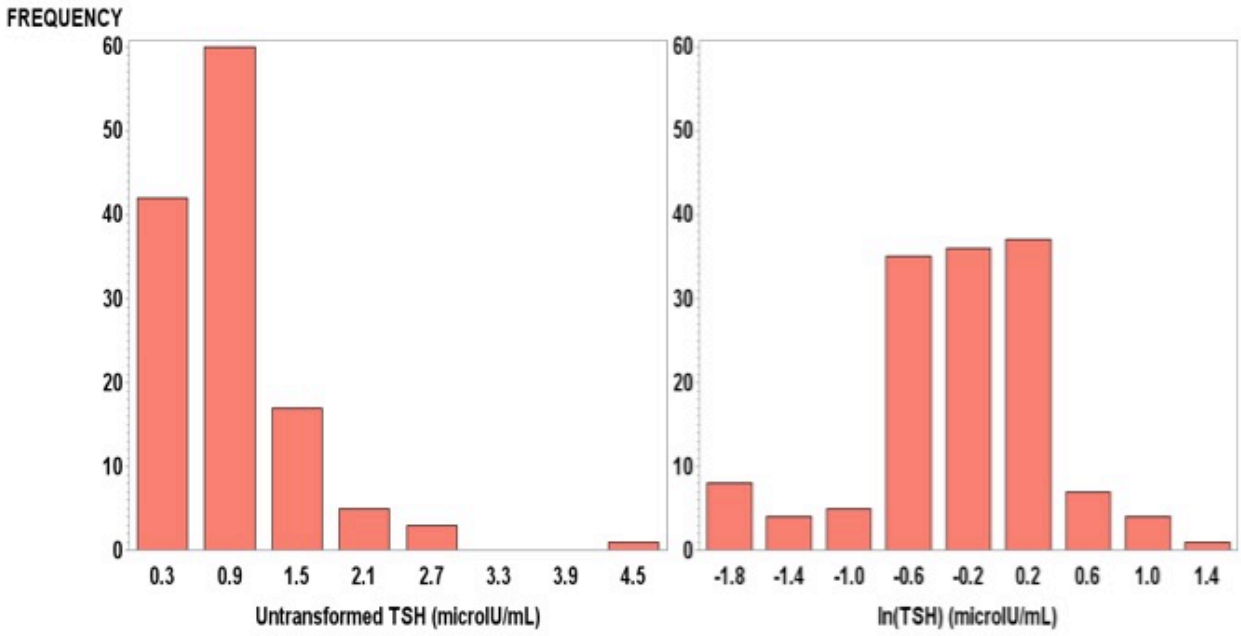
Abbreviations: ICC (intraclass correlation coefficient), TSH (thyroid stimulating hormone), TT_4 (total thyroxine), fT_4 (free thyroxine), TT_3 (total triiodothyronine), UIC (urinary iodide concentration), σ^2_W (within subject variability), σ^2_B (between subject variability)

Figure S1. Distribution of thyroid function tests: untransformed and natural log transformed: (A) Total T_4, (B) TSH, (C) Free T_4, (D) Total T_3.

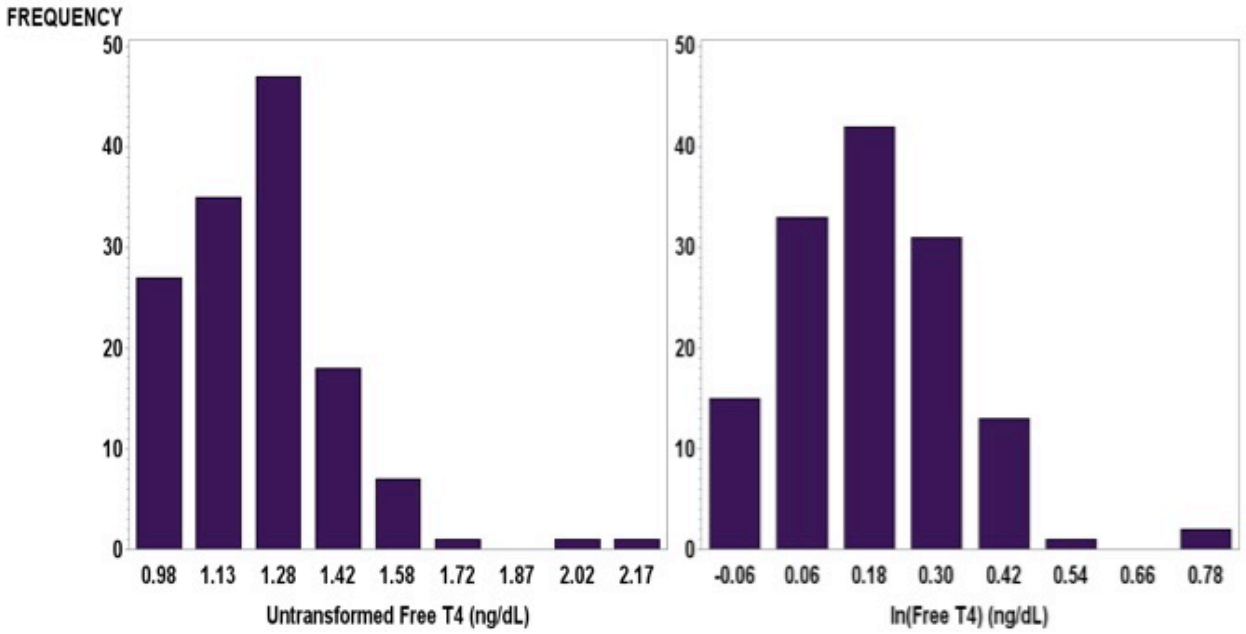
A.



B.



C.


FREQUENCY
50
40
30
20
10
0
0.98 1.13 1.28 1.42 1.58 1.72 1.87 2.02 2.17
Untransformed Free T4 (ng/dL)
-0.06 0.06 0.18 0.30 0.42 0.54 0.66 0.78
ln(Free T4) (ng/dL)

D.

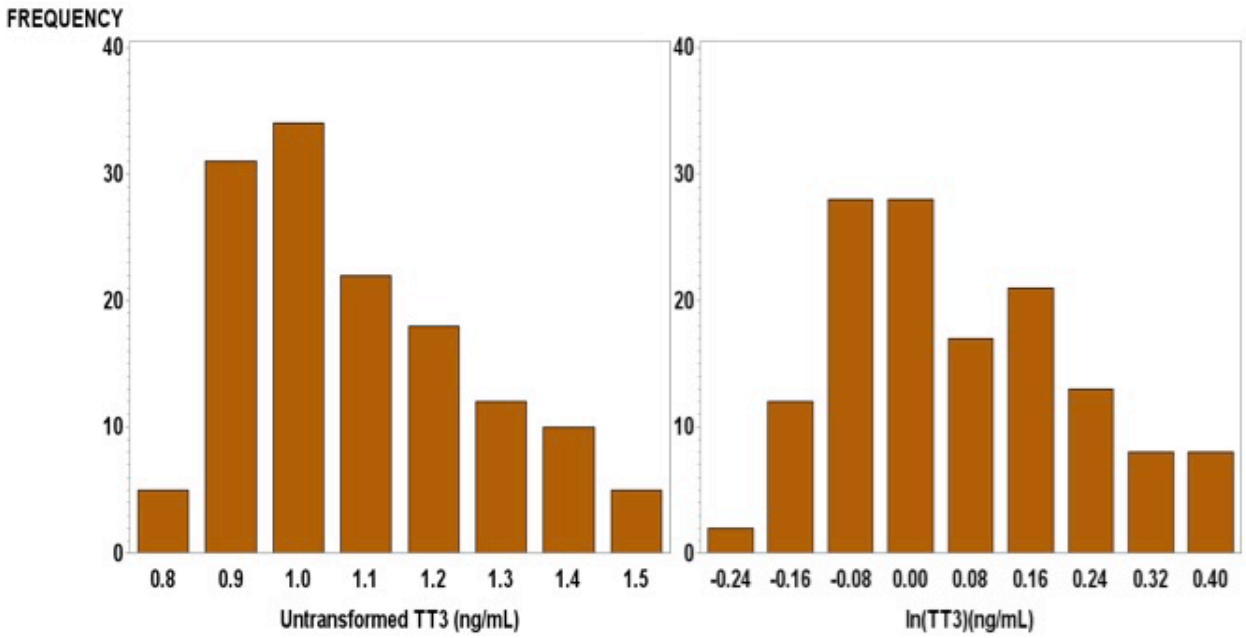
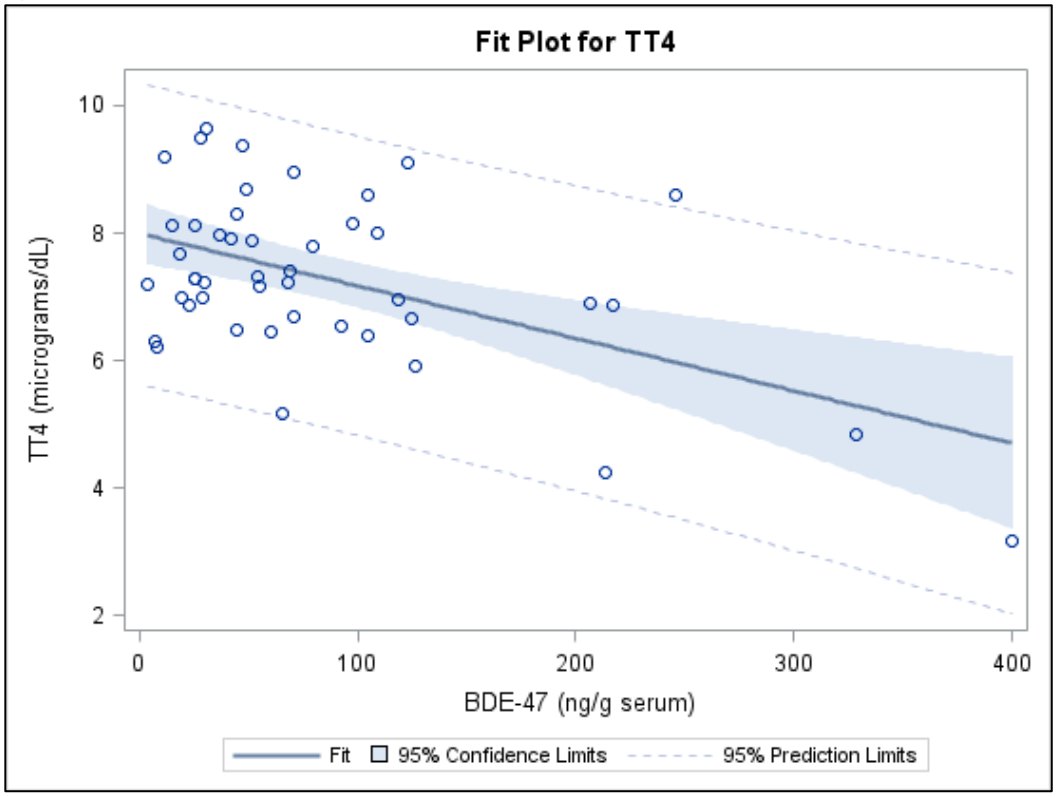
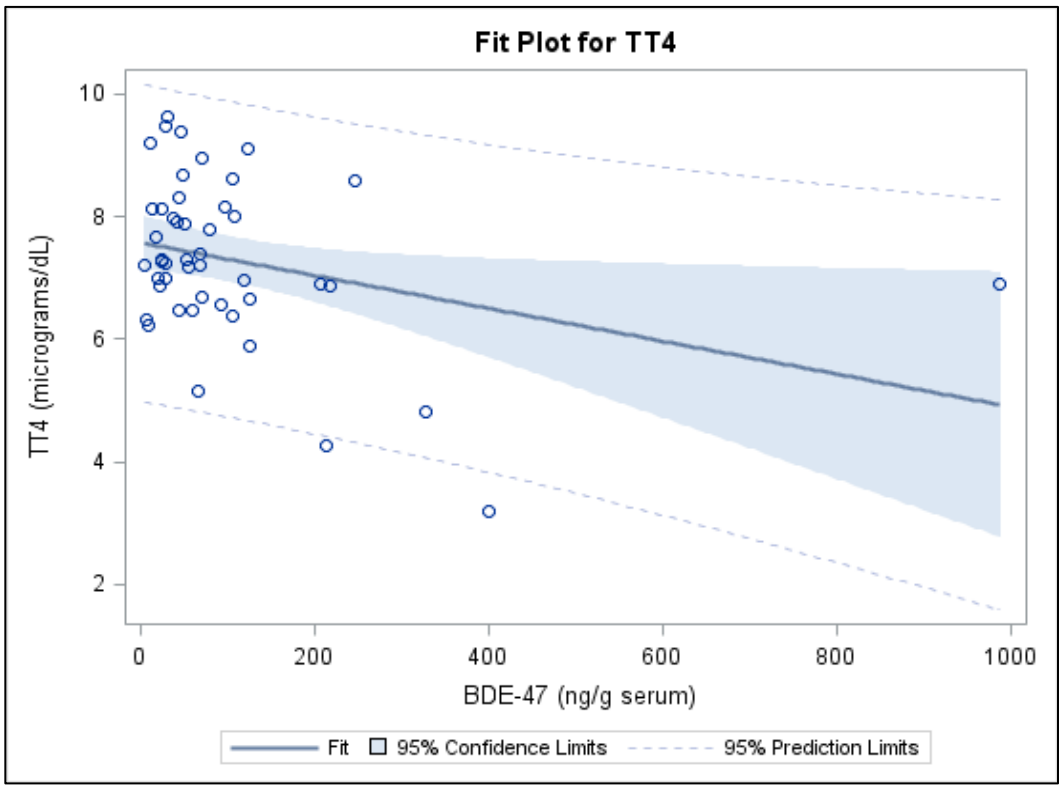

FREQUENCY
40
30
20
10
0
0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5
Untransformed TT3 (ng/mL)
-0.24 -0.16 -0.08 0.00 0.08 0.16 0.24 0.32 0.40
ln(TT3)(ng/mL)

Figure S2A-B. Unadjusted cross-sectional associations between BDE-47 and Total T_4 in Round 1: A) without outlier (N=46) B) with outlier (N=47)*.

A)



B.



A) Relationship between BDE-47 and Total T_4 in Round 1 without outlying participant (N=46) (β=-8.2, 95% CI: -12.3, -4.1). B) Relationship between BDE-47 and Total T_4 in Round 1 with outlying participant (N=47) (β=-2.7, 95% CI: -5.1, -0.27). * Outlying participant was a 64 year old, non-Hispanic white male.