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Table S1. Demographics of I-KIDS women in analytic sample by nausea type.

Characteristic	All women (n=467)	Never nausea (n=43)	Typical nausea (n=198)	Persistent nausea (n=115)	Irregular nausea (n=111)	#Sensitivity Analysis (n=311)
	n (%)					
Race/Ethnicity						
Non-Hispanic White (<i>ref</i>)	376 (80.7)	33 (76.7)	162 (82.2)	90 (78.3)	91 (82)	254 (81.7)
Others	90 (19.3)	10 (23.3)	35 (17.8)	25 (21.7)	20 (18)	57 (18.33)
Education						
Some college or less (<i>ref</i>)	85 (18.2)	10 (23.3)	27 (13.6)	26 (22.6)	22 (19.8)	52 (16.7)
College graduate or higher	382 (81.8)	33 (76.7)	171 (86.4)	89 (77.4)	89 (80.2)	259 (83.3)
Income						
<\$60,000	130 (28.1)	12 (27.9)	50 (25.5)	37 (32.7)	31 (27.9)	83 (26.9)
\$60,000-\$99,999	177 (38.2)	18 (41.9)	69 (35.2)	41 (36.3)	49 (44.1)	116 (37.5)
>\$100,000	156 (33.7)	13 (30.2)	77 (39.3)	35 (31)	31 (27.9)	110 (35.6)
Alcohol since conception						
None (<i>ref</i>)	271 (58.2)	30 (69.8)	104 (52.5)	75 (65.2)	62 (56.4)	180 (57.9)
Any alcohol consumed	195 (41.8)	13 (30.2)	94 (47.5)	40 (34.8)	48 (43.6)	131 (42.1)
Parity						
No children (<i>ref</i>)	242 (51.8)	25 (58.1)	108 (54.5)	54 (47)	55 (49.5)	168 (54.0)
At least 1 child	225 (48.2)	18 (41.9)	90 (45.5)	61 (53)	56 (50.5)	143 (46.0)
Fetal Sex						
Male (<i>ref</i>)	224 (48.0)	24 (55.8)	97 (49.0)	52 (45.0)	51 (46.0)	161 (51.8)
Female	243 (52.0)	19 (44.2)	101 (51.0)	63 (55.0)	60 (54.0)	150 (48.2)
Fragrance-free product use						
Sometimes/Always (<i>ref</i>)	291 (62.3)	20 (46.5)	131 (66.2)	62 (53.9)	78 (70.3)	191 (61.4)
Never	176 (37.7)	23 (53.5)	67 (33.8)	53 (46.1)	33 (29.7)	120 (38.6)
	Median (25 th , 75 th percentile)					
Maternal age (years)	29.9 (27.3, 32.7)	30.5 (27.2, 32.6)	30.3 (28.0, 32.7)	29.4 (26.8, 32.8)	29.6 (26.7, 32.5)	30.3 (27.5, 32.8)
Pre-pregnancy body mass index (kg/m²)	24.5 (21.9, 29.2)	25.5 (21.9, 34.0)	24.0 (21.8, 27.4)	25.0 (21.9, 30.2)	24.5 (21.8, 30.6)	24.7 (21.8, 29.2)
Early pregnancy Alternative Healthy Eating Index 2010*	51.6 (44.2, 59.8)	51.4 (36.4, 55.8)	52.8 (45.7, 61.0)	49.0 (43.9, 57.7)	51.5 (41.5, 60.3)	51.7 (44.6, 59.3)
Early pregnancy perceived stress	10.8 (6.8, 16.1)	8.1 (5.8, 10.8)	9.8 (6.2, 15.1)	13.0 (9.0, 16.8)	11.9 (7.5, 17.2)	11.1 (7.1, 16.6)

*Alcohol intake removed from the index (total score out of 100). #Women who had measurable levels of two DEHTP metabolites and all three DiNP metabolites.

Table S2. Unadjusted associations of EDC biomarkers with nausea persistence (n=467).

Biomarker	Never v typical nausea (n=241)	Persistent v typical nausea (n=313)	Irregular v typical nausea (n=309)
Odds ratio (95% Confidence Interval)			
Phthalates/replacements			
ΣDEHP	1.32 (0.97, 1.80)	1.14 (0.90, 1.45)	1.01 (0.78, 1.29)
MCPP	1.19 (0.90, 1.58)	1.15 (0.94, 1.41)	1.21 (0.99, 1.48)
MCNP	1.17 (0.88, 1.57)	0.98 (0.78, 1.24)	1.07 (0.86, 1.34)
MBzP	1.04 (0.83, 1.29)	1.09 (0.93, 1.27)	1.11 (0.95, 1.29)
MEP	1.02 (0.79, 1.30)	1.18 (1.00, 1.40)	1.19 (1.00, 1.41)
ΣDiNP (2 metabolites)	1.18 (0.95, 1.47)	1.06 (0.90, 1.24)	1.03 (0.88, 1.21)
ΣDiNP (3 metabolites)	0.81 (0.51, 1.27)	1.16 (0.94, 1.44)	1.01 (0.80, 1.29)
ΣDBP	1.36 (0.96, 1.93)	1.25 (0.98, 1.60)	1.21 (0.95, 1.56)
ΣDiBP	1.13 (0.85, 1.51)	1.03 (0.83, 1.27)	1.05 (0.85, 1.30)
ΣDINCH	0.82 (0.55, 1.21)	1.22 (0.99, 1.52)	1.05 (0.83, 1.33)
ΣDEHTP	0.81 (0.60, 1.10)	0.98 (0.83, 1.15)	0.98 (0.82, 1.18)
Phenols			
BPA	1.18 (0.91, 1.54)	1.07 (0.92, 1.24)	1.16 (0.97, 1.39)
BPS	1.05 (0.82, 1.33)	1.08 (0.91, 1.28)	1.04 (0.87, 1.23)
Methylparaben	1.06 (0.90, 1.26)	0.97 (0.86, 1.09)	0.98 (0.87, 1.11)
Ethylparaben	0.96 (0.86, 1.07)	1.03 (0.95, 1.11)	1.00 (0.93, 1.09)
Propylparaben	1.05 (0.92, 1.19)	0.99 (0.90, 1.08)	0.98 (0.90, 1.08)
BP-3	0.93 (0.81, 1.07)	0.90 (0.81, 0.99)	0.99 (0.89, 1.10)
TCS	0.91 (0.79, 1.04)	0.93 (0.84, 1.02)	0.92 (0.84, 1.02)
2,4-DCP	0.88 (0.65, 1.19)	0.96 (0.79, 1.17)	0.93 (0.76, 1.14)
2,5-DCP	0.99 (0.83, 1.17)	1.01 (0.90, 1.14)	1.01 (0.90, 1.14)

OR and 95% CI are interpreted as odds of nausea type for 2-fold increase in biomarker. Unadjusted models. Reference group: typical nausea (n=198).

Table S3. Associations of EDC biomarkers with never having nausea or having irregular nausea.

Biomarker	Never versus typical nausea (n=230)				Irregular versus typical nausea (n=291)			
	All women	Female (n=113)	Male (n=117)		All women	Female (n=150)	Male (n=141)	
	Odds Ratio (95% Confidence Interval)			P_{int}	Odds Ratio (95% Confidence Interval)			P_{int}
Phthalates/replacements								
ΣDEHP	1.31 (0.94, 1.84)	1.93 (1.11, 3.36)	1.03 (0.65, 1.62)	0.08	0.99 (0.76, 1.30)	1.36 (0.91, 2.02)	0.76 (0.51, 1.12)	0.04
MCPP	1.19 (0.88, 1.61)	1.36 (0.88, 2.11)	1.05 (0.68, 1.61)	0.40	1.18 (0.95, 1.46)	1.29 (0.96, 1.75)	1.06 (0.78, 1.45)	0.37
MCNP	1.21 (0.89, 1.64)	1.08 (0.69, 1.69)	1.35 (0.89, 2.06)	0.47	1.01 (0.79, 1.28)	0.82 (0.58, 1.17)	1.22 (0.87, 1.70)	0.11
MBzP	0.99 (0.78, 1.27)	1.10 (0.79, 1.54)	0.90 (0.64, 1.26)	0.38	1.09 (0.92, 1.29)	1.21 (0.97, 1.51)	0.94 (0.73, 1.22)	0.14
MEP	1.02 (0.78, 1.32)	1.00 (0.68, 1.46)	1.04 (0.73, 1.48)	0.89	1.19 (0.99, 1.44)	1.23 (0.96, 1.59)	1.14 (0.87, 1.49)	0.67
ΣDiNP (2 metabolites)	1.18 (0.94, 1.49)	1.31 (0.93, 1.85)	1.09 (0.79, 1.50)	0.44	1.01 (0.85, 1.20)	1.15 (0.91, 1.46)	0.88 (0.69, 1.14)	0.14
ΣDiNP (3 metabolites)	0.85 (0.52, 1.39)	0.93 (0.46, 1.88)	0.74 (0.37, 1.49)	0.65	0.98 (0.76, 1.28)	1.24 (0.90, 1.71)	0.63 (0.39, 1.01)	0.02
ΣDBP	1.39 (0.95, 2.03)	1.66 (0.97, 2.85)	1.18 (0.70, 2.00)	0.37	1.29 (0.98, 1.70)	1.23 (0.86, 1.75)	1.39 (0.92, 2.10)	0.65
ΣDiBP	1.13 (0.85, 1.51)	1.59 (1.08, 2.35)	0.70 (0.43, 1.15)	0.01	1.08 (0.86, 1.35)	1.36 (1.00, 1.85)	0.76 (0.51, 1.12)	0.02
ΣDINCH	0.84 (0.70, 1.02)	0.88 (0.62, 1.25)	0.83 (0.66, 1.04)	0.75	1.01 (0.87, 1.17)	0.99 (0.79, 1.23)	1.03 (0.83, 1.28)	0.80
ΣDEHTP	0.84 (0.60, 1.17)	0.87 (0.50, 1.50)	0.84 (0.56, 1.25)	0.92	0.86 (0.70, 1.05)	0.89 (0.67, 1.18)	0.83 (0.63, 1.10)	0.74
Phenols								
BPA	1.24 (0.92, 1.68)	1.16 (0.78, 1.72)	1.41 (0.91, 2.20)	0.50	1.15 (0.95, 1.40)	1.06 (0.87, 1.31)	1.41 (1.00, 1.99)	0.17
BPS	1.01 (0.76, 1.33)	1.12 (0.74, 1.70)	0.92 (0.62, 1.38)	0.51	0.99 (0.83, 1.18)	1.23 (0.95, 1.60)	0.79 (0.58, 1.06)	0.02
Methylparaben	1.09 (0.90, 1.31)	0.76 (0.58, 1.01)	1.49 (1.14, 1.96)	0.001	1.02 (0.90, 1.17)	1.00 (0.84, 1.20)	1.04 (0.86, 1.26)	0.77
Ethylparaben	1.00 (0.89, 1.12)	0.90 (0.75, 1.08)	1.08 (0.93, 1.27)	0.12	1.02 (0.94, 1.11)	0.95 (0.84, 1.08)	1.09 (0.96, 1.23)	0.13
Propylparaben	1.08 (0.93, 1.24)	0.87 (0.70, 1.08)	1.28 (1.05, 1.55)	0.01	1.00 (0.90, 1.10)	0.98 (0.85, 1.13)	1.01 (0.87, 1.16)	0.78
BP-3	0.96 (0.83, 1.12)	0.89 (0.74, 1.06)	1.08 (0.86, 1.36)	0.17	1.03 (0.92, 1.15)	0.96 (0.83, 1.11)	1.12 (0.94, 1.33)	0.19
TCS	0.89 (0.77, 1.03)	0.84 (0.67, 1.05)	0.93 (0.77, 1.12)	0.51	0.93 (0.84, 1.03)	0.96 (0.83, 1.11)	0.90 (0.78, 1.05)	0.57
2,4-DCP	0.87 (0.63, 1.19)	0.86 (0.52, 1.42)	0.87 (0.58, 1.32)	0.96	0.94 (0.75, 1.18)	0.95 (0.71, 1.29)	0.92 (0.66, 1.28)	0.88
2,5-DCP	0.92 (0.75, 1.12)	0.63 (0.41, 0.97)	1.06 (0.84, 1.33)	0.04	0.99 (0.85, 1.15)	0.95 (0.76, 1.17)	1.02 (0.84, 1.24)	0.59
OR and 95% CI are interpreted as odds of never nausea or irregular nausea for 2-fold increase in biomarker compared to reference group (typical nausea; n=187). Models accounted for age, race/ethnicity, education, diet quality, fragrant product use, pre-pregnancy BMI, early pregnancy perceived stress, alcohol since conception, parity, and fetal sex. Models assessing fetal sex included a multiplicative interaction term. Some women are missing covariates (n=25; race/ethnicity: n=1; diet quality index: n=19; perceived stress score: n=8; alcohol since conception: n=1). Abbreviations: EDC, endocrine disrupting chemical; P_{int} , interaction p value.								

Table S4. Associations of EDC mixture with persistent nausea during pregnancy by fetal sex (n=295).

	Persistent nausea versus typical nausea					
	All women		Women carrying females		Women carrying males	
QGComp OR (95% CI)	1.29 (0.98, 1.70)		1.01 (0.68, 1.50)		1.80 (1.12, 2.88)	
QGComp RR (95% CI)	1.14 (1.01, 1.30)		1.01 (0.80, 1.26)		1.26 (1.13, 1.41)	
Constraint	+	-	+	-	+	-
Partial effects	1.69	0.76	1.77	0.57	2.22	0.81
Biomarker						
Phthalates/Replacements						
ΣDEHP	0.16	--	0.23	--	0.02	--
MCPP	0.10	--	0.08	--	--	0.13
MCNP	--	0.33	--	0.16	--	0.33
MBzP	0.03	--	--	0.11	0.13	--
MEP	0.13	--	0.06	--	0.14	--
ΣDiNP (2 metabolites)	0.01	--	--	0.05	0.12	--
ΣDBP	0.01	--	0.11	--	0.01	--
ΣDiBP	--	0.04	0.01	--	--	0.16
ΣDiNCH	0.17	--	0.14	--	0.17	--
Phenols						
BPA	0.08	--	--	0.05	0.12	--
BPS	0.02	--	0.02	--	0.02	--
Methylparaben	--	0.28	--	0.35	0.04	--
Ethylparaben	0.17	--	0.03	--	0.18	--
Propylparaben	0.06	--	0.22	--	--	0.05
BP-3	--	0.12	--	0.13	--	0.10
TCS	--	0.24	--	0.14	--	0.23
2,4-DCP	0.04	--	0.07	--	0.00	--
2,5-DCP	0.03	--	0.02	--	0.07	--
<p>OR and 95% CI are interpreted as odds of nausea persistence for 10% increase in mixture compared to reference group (typical nausea; n=187). Models accounted for age, race/ethnicity, education, diet quality, fragrant product use, pre-pregnancy BMI, early pregnancy perceived stress, alcohol since conception, parity, and fetal sex. Some women are missing covariates (n=25; race/ethnicity: n=1; diet quality index: n=19; perceived stress score: n=8; alcohol since conception: n=1). Models were fitted without bootstraps to generate individual weights and with 500 bootstraps to estimate RR. The analytic sample was stratified by fetal sex for mixture analyses. Mixture does not include DEHP and full DiNP biomarkers. Abbreviations: CI, confidence interval; OR, odds ratio; RR, risk ratio.</p>						

Table S5. Associations of EDC mixture with persistent nausea during pregnancy by fetal sex: Sensitivity Analysis(n=209).

	Persistent nausea versus typical nausea					
	All women		Women carrying females		Women carrying males	
QGComp OR (95% CI)	1.21 (0.86, 1.69)		0.96 (0.61, 1.51)		1.68 (0.89, 3.20)	
QGComp RR (95% CI)	1.10 (0.93, 1.29)		0.98 (0.79, 1.22)		1.23 (1.00, 1.51)	
Constraint	+	-	+	-	+	-
Partial effects	2.32	0.52	1.95	0.49	4.48	0.38
Biomarker						
Phthalates/Replacements						
ΣDEHP	0.07	--	0.12	--	--	0.02
MCP	--	0.01	0.04	--	--	0.15
MNP	--	0.19	--	0.08	--	0.13
MBzP	--	0.12	--	0.17	0.08	--
MEP	0.05	--	--		0.00	--
ΣDiNP (3 metabolites)	0.15	--	0.12	--	0.14	--
ΣDBP	0.11	--	0.25	--	0.05	--
ΣDiBP	0.02	--	0.09	--	--	0.08
ΣDiNCH	0.09	--	--	0.01	0.15	--
ΣDEHTP	--	0.23	--	0.24	--	0.18
Phenols						
BPA	0.12	--	0.04	--	0.06	--
BPS	--	0.04	--	0.03	--	0.02
Methylparaben	--	0.18	--	0.28	0.11	--
Ethylparaben	0.27	--	0.08	--	0.26	--
Propylparaben	0.08	--	0.26	--	--	0.11
BP-3	0.03	--	--	0.01	0.07	--
TCS	--	0.12	--	0.04	--	0.13
2,4-DCP	--	0.10	--	0.05	--	0.17
2,5-DCP	0.01	--	--	0.07	0.09	--

OR/RR and 95% CI are interpreted as odds/risk of nausea persistence for 10% increase in mixture compared to reference group (typical nausea; n=126). Models accounted for age, race/ethnicity, education, diet quality, fragrant product use, pre-pregnancy BMI, early pregnancy perceived stress, alcohol since conception, parity, and fetal sex. Some women are missing covariates (diet quality index: n=2; perceived stress score: n=1). Models were fitted without bootstraps to generate individual weights and with 500 bootstraps to estimate RR. The analytic sample was stratified by fetal sex for mixture analyses. Abbreviations: CI, confidence interval; OR, odds ratio, RR, risk ratio.

Table S6. Posterior inclusion probabilities of EDC biomarkers and persistent nausea in the BKMR mixture (n=295).

	All women		Carrying females		Carrying males	
Phthalates/Replacements	GroupPIP	PIP	GroupPIP	PIP	GroupPIP	PIP
ΣDEHP	0.71	0.08	0.60	0.15	0.73	0.06
MCP	0.71	0.18	0.60	0.14	0.73	0.08
MCNP	0.71	0.03	0.60	0.08	0.73	0.04
MBzP	0.71	0.06	0.60	0.09	0.73	0.07
MEP	0.71	0.10	0.60	0.07	0.73	0.37
ΣDiNP (2 metabolites)	0.71	0.05	0.60	0.08	0.73	0.05
ΣDBP	0.71	0.10	0.60	0.18	0.73	0.05
ΣDiBP	0.71	0.04	0.60	0.09	0.73	0.11
ΣDiNCH	0.71	0.35	0.60	0.60	0.73	0.17
Phenols						
BPA	0.55	0.19	0.66	0.12	0.67	0.20
BPS	0.55	0.08	0.66	0.06	0.67	0.06
Methylparaben	0.55	0.07	0.66	0.14	0.67	0.15
Ethylparaben	0.55	0.16	0.66	0.06	0.67	0.09
Propylparaben	0.55	0.06	0.66	0.07	0.67	0.09
BP-3	0.55	0.12	0.66	0.24	0.67	0.05
TCS	0.55	0.20	0.66	0.17	0.67	0.08
2,4-DCP	0.55	0.06	0.66	0.08	0.67	0.06
2,5-DCP	0.55	0.07	0.66	0.06	0.67	0.06

Posterior inclusion probabilities calculated from hierarchical BKMR models fit with 200,000 iterations. Models accounted for age, race/ethnicity, education, diet quality, fragrant free product use, pre-pregnancy BMI, early pregnancy perceived stress, alcohol since conception, parity, and fetal sex. For fetal sex analyses, the sample was stratified by fetal sex. Mixture does not include DEHTP and full DiNP biomarkers.

Table S7. Posterior inclusion probabilities of EDC biomarkers with persistent nausea in the BKMR mixture: Sensitivity Analysis (n=209).

	All women		Carrying females		Carrying males	
Phthalates/Replacements	GroupPIP	PIP	GroupPIP	PIP	GroupPIP	PIP
ΣDEHP	0.64	0.05	0.64	0.10	0.85	0.02
MCP	0.64	0.13	0.64	0.11	0.85	0.02
MCNP	0.64	0.04	0.64	0.05	0.85	0.02
MBzP	0.64	0.09	0.64	0.08	0.85	0.02
MEP	0.64	0.12	0.64	0.06	0.85	0.29
ΣDiNP (3 metabolites)	0.64	0.07	0.64	0.08	0.85	0.02
ΣDBP	0.64	0.18	0.64	0.20	0.85	0.02
ΣDiBP	0.64	0.06	0.64	0.07	0.85	0.40
ΣDiNCH	0.64	0.06	0.64	0.05	0.85	0.05
ΣDEHTP	0.64	0.19	0.64	0.21	0.85	0.13
Phenols						
BPA	0.70	0.18	0.60	0.16	0.89	0.05
BPS	0.70	0.03	0.60	0.07	0.89	0.01
Methylparaben	0.70	0.04	0.60	0.12	0.89	0.04
Ethylparaben	0.70	0.39	0.60	0.07	0.89	0.82
Propylparaben	0.70	0.05	0.60	0.07	0.89	0.02
BP-3	0.70	0.06	0.60	0.22	0.89	0.01
TCS	0.70	0.14	0.60	0.11	0.89	0.03
2,4-DCP	0.70	0.06	0.60	0.09	0.89	0.01
2,5-DCP	0.70	0.05	0.60	0.08	0.89	0.02
Posterior inclusion probabilities calculated from hierarchical BKMR models fit with 200,000 iterations. Models accounted for age, race/ethnicity, education, diet quality, fragrant product use, pre-pregnancy BMI, early pregnancy perceived stress, alcohol since conception, parity, and fetal sex. For fetal sex analyses, the sample was stratified by fetal sex.						

Table S8. Associations of EDC mixture with never nausea during pregnancy by fetal sex (n= 231).

	Never nausea versus typical nausea					
	All women		Women carrying females		Women carrying males	
QGComp OR (95% CI)	0.90 (0.61, 1.34)		0.61 (0.32, 1.17)		1.17 (0.66, 2.09)	
QGComp RR (95% CI)	0.93 (0.65, 1.32)		0.74 (0.52, 1.06)		1.12 (0.74, 1.68)	
Constraint	+	-	+	-	+	-
Partial effects	1.45	0.62	1.97	0.31	2.32	0.50
Biomarker						
Phthalates/Replacements						
ΣDEHP	0.14	--	0.03	--	--	0.04
MCPP	--	0.02	--	0.01	0.03	--
MCNP	0.06	--	--	0.02	0.04	--
MBzP	--	0.10	--	0.03	--	0.13
MEP	0.01	--	0.09	--	--	0.11
ΣDiNP (2 metabolites)	0.19	--	0.11	--	0.00	--
ΣDBP	0.10	--	0.06	--	0.14	--
ΣDiBP	--	0.08	0.20	--	--	0.21
ΣDiNCH	--	0.19	--	0.05	--	0.05
Phenols						
BPA	0.07	--	0.08	--	0.06	--
BPS	--	0.01	0.15	--	--	0.02
Methylparaben	0.29	--	--	0.13	0.43	--
Ethylparaben	--	0.05	0.00	--	--	0.18
Propylparaben	0.01	--	--	0.01	0.02	--
BP-3	--	0.08	--	0.19	0.08	--
TCS	--	0.38	--	0.30	--	0.10
2,4-DCP	0.12	--	0.27	--	--	0.17
2,5-DCP	--	0.09	--	0.28	0.21	--
OR and 95% CI are interpreted as odds of never having nausea for 10% increase in mixture compared to reference group (typical nausea; n=187). Models accounted for age, race/ethnicity, education, diet quality, fragrant product use, pre-pregnancy BMI, stress at PA, alcohol since conception, parity, and fetal sex. Some women are missing covariates (n=10; diet quality index: n=9; perceived stress score: n=1). Models were fitted without bootstraps to generate individual weights and with 500 bootstraps to estimate RR. The analytic sample was stratified by fetal sex for mixture analyses. Mixture does not include DEHP and full DiNP biomarkers. Abbreviations: CI, confidence interval; OR, odds ratio; RR, risk ratio.						

Table S9. Associations of EDC mixture with never nausea during pregnancy by fetal sex: Sensitivity Analysis (n=145).

	Never nausea versus typical nausea					
	All women		Women carrying females		Women carrying males	
QGComp OR (95% CI)	0.94 (0.47, 1.88)		0.79 (0.30, 2.07)†		0.92 (0.34, 2.52)	
QGComp RR (95% CI)	0.95 (0.47, 1.93)		0.89 (0.45, 1.79)		0.94 (0.47, 1.87)	
Constraint	+	-	+	-	+	-
Partial effects	5.93	0.16	3.35	0.24	3.82	0.24
Biomarker						
Phthalates/Replacements						
ΣDEHP	0.12	--	0.11	--	0.06	--
MCP	--	0.38	--	0.20	--	0.15
MCP	0.03	--	0.06	--	0.05	--
MBzP	--	0.14	--	0.04	--	0.06
MEP	0.15	--	0.13	--	--	0.07
ΣDiNP (3 metabolites)	0.25	--	0.15	--	0.16	--
ΣDBP	--	0.05	--	0.05	--	0.00
ΣDiBP	0.12	--	0.38	--	--	0.03
ΣDiNCH	--	0.03	--	0.05	0.06	--
ΣDEHTP	--	0.01	0.01	--	--	0.10
Phenols						
BPA	0.01	--	0.00	--	--	0.04
BPS	0.02	--	0.08	--	--	0.13
Methylparaben	0.31	--	0.06	--	0.40	--
Ethylparaben	--	0.06	0.02	--	--	0.06
Propylparaben	--	0.11	--	0.00	--	0.15
BP-3	--	0.05	--	0.17	0.03	--
TCS	--	0.13	--	0.10	--	0.18
2,4-DCP	--	0.01	--	0.04	--	0.04
2,5-DCP	--	0.03	--	0.35	0.24	--

OR and 95% CI are interpreted as odds of never having nausea for 10% increase in mixture compared to reference group (typical nausea; n=126). Models accounted for age, race/ethnicity, education, diet quality, fragrant product use, pre-pregnancy BMI, stress at PA, alcohol since conception, parity, and fetal sex. Some women are missing covariates (n=9; diet quality index: n=9). Models were fitted without bootstraps to generate individual weights and with 500 bootstraps to estimate RR. The analytic sample was stratified by fetal sex for mixture analyses. Mixture does not include DEHTP and full DiNP biomarkers. Abbreviations: CI, confidence interval; OR, odds ratio; RR, risk ratio.

†Model would not converge due to sparsity unless education covariate was removed.

Table S10. Posterior inclusion probabilities of EDC biomarkers with never nausea for the BKMR mixture (n=231).

	All women		Carrying females		Carrying males	
Phthalates/Replacements	GroupPIP	PIP	GroupPIP	PIP	GroupPIP	PIP
ΣDEHP	0.77	0.06	0.65	0.21	0.60	0.07
MCPP	0.77	0.53	0.65	0.06	0.60	0.24
MCNP	0.77	0.05	0.65	0.10	0.60	0.11
MBzP	0.77	0.03	0.65	0.05	0.60	0.07
MEP	0.77	0.04	0.65	0.05	0.60	0.06
ΣDiNP (2 metabolites)	0.77	0.07	0.65	0.07	0.60	0.07
ΣDBP	0.77	0.13	0.65	0.14	0.60	0.15
ΣDiBP	0.77	0.04	0.65	0.28	0.60	0.09
ΣDiNCH	0.77	0.06	0.65	0.04	0.60	0.12
Phenols						
BPA	0.58	0.10	0.90	0.02	0.78	0.08
BPS	0.58	0.06	0.90	0.02	0.78	0.03
Methylparaben	0.58	0.07	0.90	0.08	0.78	0.46
Ethylparaben	0.58	0.07	0.90	0.02	0.78	0.05
Propylparaben	0.58	0.08	0.90	0.10	0.78	0.17
BP-3	0.58	0.11	0.90	0.08	0.78	0.04
TCS	0.58	0.32	0.90	0.07	0.78	0.06
2,4-DCP	0.58	0.10	0.90	0.02	0.78	0.05
2,5-DCP	0.58	0.09	0.90	0.61	0.78	0.06
Posterior inclusion probabilities calculated from hierarchical BKMR models fit with 200,000 iterations. Models accounted for age, race/ethnicity, education, diet quality, fragrant free product use, pre-pregnancy BMI, early pregnancy perceived stress, alcohol since conception, parity, and fetal sex. For fetal sex analyses, the sample was stratified by fetal sex. Mixture does not include DEHTP and full DiNP biomarkers.						

Table S11. Associations of EDC mixture with irregular nausea during pregnancy by fetal sex (n= 292).

	Irregular nausea versus typical nausea					
	All women		Women carrying females		Women carrying males	
QGComp OR (95% CI)	1.05 (0.81, 1.36)		1.05 (0.73, 1.52)		1.00 (0.61, 1.64)	
QGComp RR (95% CI)	1.03 (0.87, 1.22)		1.03 (0.81, 1.31)		1.00 (0.76, 1.32)	
Constraint	+	-	+	-	+	-
Partial effects	1.43	0.73	1.87	0.56	2.59	0.39
Biomarker						
Phthalates/Replacements						
ΣDEHP	0.02	--	0.09	--	--	0.10
MCP	0.20	--	0.10	--	0.06	--
MCNP	--	0.10	--	0.25	0.17	--
MBzP	0.03	--	0.20	--	--	0.15
MEP	0.12	--	0.15	--	0.05	--
ΣDiNP (2 metabolites)	--	0.19	0.10	--	--	0.30
ΣDBP	0.13	--	--	0.07	0.20	--
ΣDiBP	0.03	--	0.23	--	--	0.16
ΣDiNCH	--	0.06	--	0.16	0.06	--
Phenols						
BPA	0.12	--			0.23	--
BPS	--	0.06	0.08	--	--	0.06
Methylparaben	0.12	--	--	0.09	0.00	--
Ethylparaben	0.02	--	--	0.04	0.07	--
Propylparaben	--	0.25	0.04	--	--	0.14
BP-3	0.08	--	--	0.08	0.07	--
TCS	--	0.28	--	0.05	--	0.10
2,4-DCP	0.14	--	--	0.04	0.03	--
2,5-DCP	--	0.06	--	0.06	0.06	--
OR and 95% CI are interpreted as odds of irregular nausea for 10% increase in mixture compared to reference group (typical nausea; n=187). Models accounted for age, race/ethnicity, education, diet quality, fragrant product use, pre-pregnancy BMI, stress at PA, alcohol since conception, parity, and fetal sex. Some women are missing covariates (n=17; diet quality index: n=13; perceived stress score: n=3; alcohol since conception: n=1). Models were fitted without bootstraps to generate individual weights and with 500 bootstraps to estimate RR. The analytic sample was stratified by fetal sex for mixture analyses. Mixture does not include DEHTP and DiNP (3 metabolite) biomarkers. Abbreviations: CI, confidence interval; OR, odds ratio; RR, risk ratio.						

Table S12. Associations of EDC mixture with irregular nausea during pregnancy by fetal sex: Sensitivity Analysis (n=190).

	Irregular nausea versus typical nausea					
	All women		Women carrying females		Women carrying males	
QGComp OR (95% CI)	0.93 (0.66, 1.33)		0.93 (0.58, 1.50)		0.69 (0.31, 1.54)	
QGComp RR (95% CI)	0.96 (0.77, 1.20)		0.96 (0.70, 1.31)		0.84 (0.61, 1.16)	
Constraint	+	-	+	-	+	-
Partial effects	1.63	0.57	2.14	0.43	3.71	0.19
Biomarker						
Phthalates/Replacements						
ΣDEHP	0.08	--	0.14	--	--	0.07
MCP	0.08	--	0.12	--	--	0.00
MCP	0.03	--	--	0.21	0.12	--
MBzP	--	0.12	0.04	--	--	0.10
MEP	0.23	--	0.22	--	--	0.04
ΣDiNP (3 metabolites)	--	0.18	0.08	--	--	0.15
ΣDBP	0.08	--	0.09	--	0.14	--
ΣDiBP	--	0.01	0.16	--	--	0.16
ΣDiNCH	0.05	--	0.00	--	--	0.02
ΣDEHTP	--	0.15	--	0.15	--	0.04
Phenols						
BPA	0.09	--	--	0.11	0.24	--
BPS	--	0.27	--	0.16	--	0.13
Methylparaben	--	0.04	--	0.11	--	0.02
Ethylparaben	0.06	--	--	0.08	0.15	--
Propylparaben	--	0.01	0.13	--	--	0.06
BP-3	0.13	--	--	0.10	0.25	--
TCS	--	0.22	--	0.09	--	0.14
2,4-DCP	0.03	--	0.00	--	--	0.06
2,5-DCP	0.13	--	0.02	--	0.10	--

OR and 95% CI are interpreted as odds of irregular nausea for 10% increase in mixture compared to reference group (typical nausea; n=126). Models accounted for age, race/ethnicity, education, diet quality, fragrant product use, pre-pregnancy BMI, stress at PA, alcohol since conception, parity, and fetal sex. Some women are missing covariates (n=13; diet quality index: n=12; perceived stress score: n=1). Models were fitted without bootstraps to generate individual weights and with 500 bootstraps to estimate RR. The analytic sample was stratified by fetal sex for mixture analyses. Mixture does not include DEHTP and full DiNP biomarkers. Abbreviations: CI, confidence interval; OR, odds ratio; RR, risk ratio.

Table S13. Posterior inclusion probabilities of EDC biomarkers with irregular nausea for the BKMR mixture (n=231).

	All women		Carrying females		Carrying males	
Phthalates/Replacements	GroupPIP	PIP	GroupPIP	PIP	GroupPIP	PIP
ΣDEHP	0.65	0.08	0.76	0.14	0.63	0.12
MCP	0.65	0.19	0.76	0.09	0.63	0.07
MCNP	0.65	0.04	0.76	0.05	0.63	0.07
MBzP	0.65	0.06	0.76	0.12	0.63	0.06
MEP	0.65	0.08	0.76	0.05	0.63	0.07
ΣDiNP (2 metabolites)	0.65	0.13	0.76	0.06	0.63	0.25
ΣDBP	0.65	0.26	0.76	0.08	0.63	0.23
ΣDiBP	0.65	0.06	0.76	0.39	0.63	0.09
ΣDiNCH	0.65	0.04	0.76	0.03	0.63	0.05
Phenols						
BPA	0.52	0.17	0.57	0.18	0.67	0.48
BPS	0.52	0.14	0.57	0.14	0.67	0.11
Methylparaben	0.52	0.08	0.57	0.08	0.67	0.05
Ethylparaben	0.52	0.08	0.57	0.09	0.67	0.06
Propylparaben	0.52	0.07	0.57	0.06	0.67	0.05
BP-3	0.52	0.08	0.57	0.13	0.67	0.07
TCS	0.52	0.15	0.57	0.09	0.67	0.09
2,4-DCP	0.52	0.11	0.57	0.11	0.67	0.05
2,5-DCP	0.52	0.10	0.57	0.12	0.67	0.05

Posterior inclusion probabilities calculated from hierarchical BKMR models fit with 200,000 iterations. Models accounted for age, race/ethnicity, education, diet quality, fragrant free product use, pre-pregnancy BMI, early pregnancy perceived stress, alcohol since conception, parity, and fetal sex. For fetal sex analyses, the sample was stratified by fetal sex. Mixture does not include DEHTP and full DiNP biomarkers.

Table S14. Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement—Checklist of items that should be included in reports of cohort studies.

	Item No	Recommendation	Section
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	Abstract
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	Abstract
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	1
Objectives	3	State specific objectives, including any prespecified hypotheses	1
Methods			
Study design	4	Present key elements of study design early in the paper	2.1
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	2
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up	2.1
		(b) For matched studies, give matching criteria and number of exposed and unexposed	N/A
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	2.3-2.5
Data sources/measurement	8	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	2.2-2.4
Bias	9	Describe any efforts to address potential sources of bias	2.2-2.5
Study size	10	Explain how the study size was arrived at	2.1, 2.5.1,
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	2.4
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	2.5
		(b) Describe any methods used to examine subgroups and interactions	2.5.7
		(c) Explain how missing data were addressed	2.5.2
		(d) If applicable, explain how loss to follow-up was addressed	2.1
		(e) Describe any sensitivity analyses	2.5.8
Results			
Participants	13	(a) Report numbers of individuals at each stage of study—e.g. numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analyzed	2.5.1, 3.1, Table 1
		(b) Give reasons for non-participation at each stage	2.5.1
		(c) Consider use of a flow diagram	Supplemental Figure 1
Descriptive data	14	(a) Give characteristics of study participants (e.g. demographic, clinical, social) and information on exposures and potential confounders	3.1, Table 1, Supplemental Table 1
		(b) Indicate number of participants with missing data for each variable of interest	2.5.2, Table 2
		(c) Summarize follow-up time (e.g., average and total amount)	2.4
Outcome data	15	Report numbers of outcome events or summary measures over time	3, Table 2, Figure 1
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (e.g., 95% confidence interval). Make clear which confounders were adjusted for and why they were included	3.3, 3.4, Table 3, Supplemental Table 2
		(b) Report category boundaries when continuous variables were categorized	2.5.4, Table 1
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A
Other analyses	17	Report other analyses done—e.g. analyses of subgroups and interactions, and sensitivity analyses	Supplemental Tables and Figures
Discussion			
Key results	18	Summarize key results with reference to study objectives	4.1
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	4.6
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	4.6
Generalizability	21	Discuss the generalizability (external validity) of the study results	4
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	Included

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background each published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at <http://www.strobe-statement.org>.

Table S15. Unadjusted associations between EDC biomarkers and gestational hormones in I-KIDS women (n=302).

Biomarker	Progesterone (n=300)	Estradiol (n=300)	Testosterone (n=254)	Free T4 (n=299)	Total T4 (n=299)	TSH (n=299)
	%Δ (95% CI)	%Δ (95% CI)	%Δ (95% CI)	%Δ (95% CI)	%Δ (95% CI)	μIU/mL Δ (95% CI)
Phthalates/replacements						
ΣDEHP	0.05 (-0.42, 0.51)	0.07 (-0.69, 0.85)	-0.41 (-1.24, 0.42)	0.04 (-0.13, 0.22)	0.07 (-0.19, 0.33)	0.00 (-0.02, 0.02)
MCPP	-0.21 (-0.63, 0.21)	-0.69 (-1.39, 0.01)	-0.74 (-1.50, 0.03)	0.04 (-0.12, 0.21)	0.11 (-0.13, 0.35)	0.00 (-0.02, 0.01)
MCNP	-0.23 (-0.74, 0.28)	-0.86 (-1.7, -0.02)*	-0.22 (-1.21, 0.77)	0.08 (-0.12, 0.27)	0.27 (-0.02, 0.56)	0.00 (-0.02, 0.02)
MBzP	-0.04 (-0.35, 0.26)	-0.08 (-0.59, 0.42)	0.07 (-0.48, 0.62)	0.05 (-0.07, 0.16)	0.23 (0.06, 0.40)*	0.01 (0.00, 0.02)
MEP	-0.05 (-0.39, 0.29)	-0.26 (-0.81, 0.30)	0.66 (0.05, 1.28)*	0.04 (-0.08, 0.17)	0.00 (-0.19, 0.19)	-0.01 (-0.02, 0.01)
ΣDiNP	-0.23 (-0.59, 0.13)	-0.44 (-1.03, 0.15)	-0.22 (-0.87, 0.44)	-0.04 (-0.18, 0.09)	0.04 (-0.16, 0.25)	0.00 (-0.02, 0.01)
ΣDBP	0.23 (-0.25, 0.70)	-0.49 (-1.27, 0.30)	-0.02 (-0.88, 0.85)	0.07 (-0.11, 0.25)	0.00 (-0.26, 0.27)	0.01 (-0.01, 0.03)
ΣDiBP	-0.14 (-0.53, 0.25)	-0.61 (-1.24, 0.02)	0.25 (-0.43, 0.94)	0.06 (-0.09, 0.21)	-0.07 (-0.29, 0.16)	-0.01 (-0.02, 0.01)
ΣDiNCH	-0.18 (-0.51, 0.15)	-0.25 (-0.8, 0.29)	0.25 (-0.36, 0.87)	0.03 (-0.09, 0.16)	-0.02 (-0.20, 0.17)	-0.01 (-0.02, 0.01)
ΣDEHTP	-0.33 (-0.60, -0.05)*	-0.28 (-0.74, 0.18)	0.11 (-0.40, 0.63)	0.02 (-0.08, 0.13)	0.05 (-0.11, 0.21)	0.00 (-0.01, 0.01)
Paraben						
Ethylparaben	0.04 (-0.11, 0.19)	-0.15 (-0.40, 0.10)	-0.10 (-0.36, 0.17)	0.00 (-0.06, 0.05)	-0.03 (-0.11, 0.06)	0.00 (-0.01, 0.00)
Methylparaben	-0.09 (-0.33, 0.15)	0.02 (-0.38, 0.42)	-0.17 (-0.60, 0.27)	0.06 (-0.04, 0.15)	-0.01 (-0.15, 0.13)	-0.01 (-0.02, 0.00)
Propylparaben	-0.12 (-0.29, 0.06)	0.06 (-0.24, 0.35)	-0.4 (-0.72, -0.08)*	0.02 (-0.04, 0.09)	0.00 (-0.10, 0.10)	-0.01 (-0.01, 0.00)
Phenols						
BPA	-0.01 (-0.30, 0.29)	0.18 (-0.31, 0.68)	0.39 (-0.13, 0.91)	0.04 (-0.07, 0.16)	0.09 (-0.08, 0.26)	-0.01 (-0.02, 0.01)
BPS	-0.17 (-0.47, 0.14)	0.07 (-0.44, 0.59)	-0.19 (-0.77, 0.39)	-0.04 (-0.16, 0.07)	-0.05 (-0.23, 0.12)	-0.01 (-0.02, 0.01)
BP-3	-0.02 (-0.20, 0.17)	-0.15 (-0.45, 0.16)	0.02 (-0.31, 0.35)	-0.02 (-0.09, 0.05)	0.01 (-0.09, 0.12)	0.00 (-0.01, 0.01)
TCS	0.12 (-0.06, 0.29)	0.10 (-0.2, 0.40)	-0.41 (-0.74, -0.09)*	-0.02 (-0.09, 0.05)	-0.05 (-0.15, 0.05)	0.00 (-0.01, 0.01)
2,4-DCP	0.34 (-0.02, 0.71)	0.08 (-0.53, 0.70)	-0.58 (-1.23, 0.06)	0.12 (-0.02, 0.26)	0.13 (-0.08, 0.34)	0.00 (-0.01, 0.01)
2,5-DCP	0.06 (-0.18, 0.29)	-0.16 (-0.55, 0.22)	-0.19 (-0.60, 0.22)	0.05 (-0.03, 0.14)	0.18 (0.05, 0.31)*	-0.01 (-0.02, 0.00)

Data are presented as the percent change (%Δ) and 95% CI in plasma hormone concentrations with every 10% increase in chemical biomarker. For TSH, data are presented as μIU/mL change and 95% CI in TSH for every 10% increase in chemical biomarker. Linear regression models evaluated associations of individual chemical biomarkers with plasma hormones. Bold signifies potentially meaningful findings with asterisk (*) denoting statistically significant findings at $P < 0.05$. ΣDEHP = (MEHP/278) + (MEHHP/294) + (MEOHP/292) + (MECPP/308); ΣDiNP = (MiNP/292) + (MCOP/322) + (MONP/306); ΣDBP = (MBP/222) + (MHBP/238); ΣDiBP = (MiBP/222) + (MHiBP/238); ΣDiNCH = (MHiNCH/314) + (MCOCH/328); and ΣDEHTP = (MEHHTP/294) + (MECPTP/308). Abbreviations: CI, confidence interval; EDCs, endocrine disrupting chemicals; ΣDEHP, sum of di-2-ethylhexyl phthalate metabolites; ΣDEHTP, sum of di-2-ethylhexyl terephthalate metabolites; ΣDiNP, sum of di-isononyl phthalate metabolites; ΣDiBP, sum of di-iso-butyl phthalate metabolites; ΣDiNCH, sum of di(isononyl) cyclohexane-1,2-dicarboxylate metabolites; BPA, bisphenol A; BPS, bisphenol S; BPF, bisphenol F; TCS, triclosan; 2,4-DCP, 2,4-dichlorophenol; 2,5-DCP, 2,5-dichlorophenol; T4, thyroxine; TSH, thyroid stimulating hormone.

Table S16. Associations between the EDC biomarker mixture and mid-pregnancy plasma hormones.

	Negatively Constrained WQSR Models			Positively Constrained WQSR Models		
	All women	Carrying females	Carrying Males	All women	Carrying females	Carrying Males
	%Δ (95% CI)	%Δ (95% CI)	%Δ (95% CI)	%Δ (95% CI)	%Δ (95% CI)	%Δ (95% CI)
Progesterone	n = 295	n = 151	n = 144	n = 295	n = 151	n = 144
	0.18 (-1.76, 2.16)	-1.47 (-4.42, 1.58)	No - β	-1.62 (-3.55, 0.36)	No + β	1.12 (-2.61, 4.99)
Estradiol	n = 295	n = 150	n = 145	n = 295	n = 150	n = 145
	-2.00 (-5.64, 1.77)	-1.52 (-6.36, 3.57)	-3.92 (-9.70, 2.20)	No + β	2.59 (-2.97, 8.47)	No + β
Testosterone	n = 250	n = 128	n = 122	n = 250	n = 128	n = 122
	-5.65 (-9.79, -1.28)*	-3.53 (-9.61, 2.96)	-4.71 (-11.83, 2.98)	No + β	No + β	No + β
Free T4	n = 294	n = 150	n = 144	n = 294	n = 150	n = 144
	0.09 (-0.87, 1.06)	0.48 (-0.86, 1.83)	-0.91 (-2.51, 0.72)	No + β	0.39 (-0.89, 1.69)	No + β
Total T4	n = 294	n = 150	n = 144	n = 294	n = 150	n = 144
	0.02 (-1.47, 1.54)	No - β	-1.77 (-4.08, 0.58)	0.67 (-0.75, 2.10)	1.50 (-0.15, 3.18)	-1.08 (-3.04, 0.91)
TSH	n = 294	n = 150	n = 144	n = 294	n = 150	n = 144
	-0.09 (-0.20, 0.00)*	-0.05 (-0.18, 0.08)	-0.18 (-0.33, -0.03)*	No + β	No + β	No + β

Data are presented as the percent change (%Δ) and 95% CI in plasma hormone concentrations with every 10% increase in EDC mixture. For TSH, data are presented as μIU/mL change in TSH for every 10% increase in the EDC mixture. All models account for educational attainment, age, diet quality, pre-pregnancy body mass index, perceived stress in early pregnancy, lifetime smoking status, parity, race/ethnicity, gestational age at plasma hormone assessment, and fetal sex. WQSR models evaluated associations of the chemical biomarker mixture with plasma hormones; models constrained in the positive and negative directions were assessed. Bold signifies potentially meaningful findings with asterisk (*) denoting statistically significant findings at $P < 0.05$. $^1\Sigma\text{DEHP} = (\text{MEHP}/278) + (\text{MEHHP}/294) + (\text{MEOHP}/292) + (\text{MECPP}/308)$; $\Sigma\text{DiNP} = (\text{MiNP}/292) + (\text{MCOP}/322) + (\text{MONP}/306)$; $\Sigma\text{DBP} = (\text{MBP}/222) + (\text{MHBP}/238)$; $\Sigma\text{DiBP} = (\text{MiBP}/222) + (\text{MHBP}/238)$; $\Sigma\text{DiNCH} = (\text{MHINCH}/314) + (\text{MCOCH}/328)$; and $\Sigma\text{DEHTP} = (\text{MEHHTP}/294) + (\text{MECTP}/308)$. Abbreviations: CI, confidence interval; EDCs, endocrine disrupting chemicals; T4, thyroxine; TSH, thyroid stimulating hormone; WQSR, weighted quantile sum regression.

Women missing covariates in progesterone analyses (n=5). Diet (n=3), stress (n=2).

Women missing covariates in estradiol analyses (n=5). Diet (n=3), stress (n=2).

Women missing covariates in testosterone analyses (n=4). Diet (n=2), stress (n=2).

Women missing covariates in thyroid hormones analyses (n=5). Diet (n=3), stress (n=2).

Table S17. Relative weights (95% Confidence Intervals) from weighted quantile sums regression models evaluating associations of the EDC biomarkers mixture with sex-steroid hormones.

	Progesterone			Estradiol			Testosterone		
	All women (n=295)	Carrying females (n=151)	Carrying males (n=144)	All women (n=295)	Carrying females (n=150)	Carrying males (n=145)	All women (n=250)	Carrying females (n=128)	Carrying males (n=122)
Negatively Constrained WQSR Model									
Biomarker	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
BP-3	0.07 (0.00, 0.21)	0.12 (0.02, 0.31)	--	0.08 (0.00, 0.21)	0.07 (0.00, 0.22)	0.06 (0.00, 0.16)	0.02 (0.00, 0.10)	0.03 (0.00, 0.09)	0.05 (0.00, 0.14)
ΣDEHTP	0.11 (0.10, 0.28)	0.11 (0.02, 0.30)	--	0.05 (0.00, 0.16)	0.05 (0.00, 0.15)	0.04 (0.00, 0.13)	0.07 (0.00, 0.15)	0.05 (0.00, 0.15)	0.10 (0.02, 0.25)
BPA	0.07 (0.00, 0.19)	0.10 (0.01, 0.27)	--	0.02 (0.00, 0.09)	0.00 (0.00, 0.04)	0.09 (0.01, 0.25)	0.01 (0.00, 0.07)	0.02 (0.00, 0.06)	0.06 (0.00, 0.17)
MEP	0.07 (0.00, 0.21)	0.07 (0.00, 0.24)	--	0.07 (0.00, 0.18)	0.08 (0.00, 0.20)	0.09 (0.01, 0.21)	0.01 (0.00, 0.02)	0.01 (0.00, 0.06)	0.03 (0.00, 0.10)
Ethylparaben	0.05 (0.00, 0.16)	0.07 (0.00, 0.22)	--	0.07 (0.00, 0.19)	0.04 (0.00, 0.14)	0.06 (0.00, 0.17)	0.04 (0.00, 0.16)	0.09 (0.00, 0.24)	0.03 (0.00, 0.12)
Methylparaben	0.06 (0.00, 0.20)	0.07 (0.00, 0.22)	--	0.04 (0.00, 0.10)	0.02 (0.00, 0.08)	0.05 (0.00, 0.16)	0.04 (0.00, 0.13)	0.04 (0.00, 0.13)	0.06 (0.00, 0.16)
ΣDiNCH	0.03 (0.00, 0.13)	0.05 (0.00, 0.17)	--	0.05 (0.00, 0.14)	0.08 (0.00, 0.22)	0.02 (0.00, 0.11)	0.03 (0.00, 0.11)	0.06 (0.00, 0.17)	0.03 (0.00, 0.10)
ΣDiBP	0.03 (0.00, 0.16)	0.05 (0.0, 0.21)	--	0.10 (0.01, 0.23)	0.12 (0.01, 0.27)	0.07 (0.00, 0.19)	0.01 (0.00, 0.06)	0.02 (0.00, 0.02)	0.03 (0.00, 0.10)
MBzP	0.06 (0.00, 0.20)	0.05 (0.0, 0.17)	--	0.03 (0.00, 0.13)	0.04 (0.00, 0.13)	0.04 (0.00, 0.14)	0.02 (0.00, 0.08)	0.04 (0.00, 0.13)	0.04 (0.00, 0.12)
ΣDEHP	0.06 (0.00, 0.19)	0.05 (0.0, 0.15)	--	0.05 (0.00, 0.18)	0.08 (0.00, 0.28)	0.04 (0.00, 0.14)	0.05 (0.00, 0.14)	0.07 (0.00, 0.17)	0.03 (0.00, 0.12)
MCNP	0.02 (0.00, 0.09)	0.05 (0.0, 0.15)	--	0.05 (0.00, 0.17)	0.06 (0.00, 0.20)	0.06 (0.00, 0.16)	0.05 (0.00, 0.15)	0.04 (0.00, 0.15)	0.04 (0.00, 0.10)
TCS	0.05 (0.00, 0.17)	0.04 (0.0, 0.15)	--	0.05 (0.00, 0.15)	0.06 (0.00, 0.21)	0.03 (0.00, 0.11)	0.14 (0.04, 0.28)	0.10 (0.01, 0.34)	0.11 (0.02, 0.22)
2,5-DCP	0.06 (0.00, 0.21)	0.04 (0.0, 0.16)	--	0.10 (0.02, 0.22)	0.06 (0.00, 0.17)	0.12 (0.02, 0.23)	0.12 (0.02, 0.28)	0.10 (0.01, 0.27)	0.12 (0.02, 0.27)
2,4-DCP	0.04 (0.00, 0.16)	0.04 (0.0, 0.12)	--	0.08 (0.01, 0.21)	0.07 (0.00, 0.22)	0.02 (0.00, 0.07)	0.08 (0.01, 0.19)	0.05 (0.00, 0.17)	0.05 (0.00, 0.13)
Propylparaben	0.07 (0.00, 0.20)	0.03 (0.0, 0.13)	--	0.03 (0.00, 0.13)	0.02 (0.00, 0.08)	0.04 (0.00, 0.11)	0.13 (0.02, 0.30)	0.12 (0.01, 0.27)	0.05 (0.00, 0.15)
BPS	0.06 (0.00, 0.23)	0.02 (0.0, 0.09)	--	0.03 (0.00, 0.10)	0.02 (0.00, 0.09)	0.07 (0.00, 0.25)	0.11 (0.02, 0.23)	0.11 (0.02, 0.22)	0.07 (0.01, 0.18)
ΣDBP	0.01 (0.00, 0.05)	0.02 (0.0, 0.10)	--	0.02 (0.00, 0.08)	0.06 (0.00, 0.21)	0.03 (0.00, 0.09)	0.01 (0.00, 0.05)	0.02 (0.00, 0.06)	0.03 (0.00, 0.08)
MCPP	0.05 (0.00, 0.17)	0.01 (0.0, 0.04)	--	0.05 (0.00, 0.15)	0.03 (0.00, 0.12)	0.04 (0.00, 0.12)	0.04 (0.00, 0.12)	0.03 (0.00, 0.12)	0.04 (0.00, 0.12)
ΣDiNP	0.03 (0.00, 0.14)	0.01 (0.0, 0.06)	--	0.03 (0.00, 0.10)	0.06 (0.00, 0.18)	0.02 (0.00, 0.06)	0.01 (0.00, 0.05)	0.04 (0.00, 0.12)	0.03 (0.00, 0.11)
Positively Constrained WQSR Model									
Biomarker	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
BP-3	0.05 (0.00, 0.19)	--	0.08 (0.00, 0.25)	--	0.04 (0.0, 0.17)	--	--	--	--
ΣDEHTP	0.02 (0.00, 0.11)	--	0.04 (0.00, 0.16)	--	0.04 (0.0, 0.16)	--	--	--	--
BPA	0.04 (0.00, 0.19)	--	--	--	0.22 (0.04, 0.41)	--	--	--	--
MEP	0.04 (0.00, 0.16)	--	0.07 (0.0, 0.21)	--	0.03 (0.0, 0.12)	--	--	--	--
Ethylparaben	0.09 (0.00, 0.25)	--	0.08 (0.01, 0.25)	--	0.12 (0.01, 0.30)	--	--	--	--
Methylparaben	0.03 (0.00, 0.10)	--	0.04 (0.00, 0.13)	--	0.05 (0.0, 0.21)	--	--	--	--
ΣDiNCH	0.08 (0.00, 0.23)	--	0.08 (0.01, 0.18)	--	0.03 (0.0, 0.14)	--	--	--	--
DiBP	0.09 (0.00, 0.23)	--	0.08 (0.00, 0.20)	--	0.01 (0.0, 0.07)	--	--	--	--
MBzP	0.02 (0.00, 0.09)	--	0.04 (0.0, 0.11)	--	0.02 (0.0, 0.08)	--	--	--	--
ΣDEHP	0.03 (0.00, 0.15)	--	0.04 (0.00, 0.14)	--	0.03 (0.0, 0.12)	--	--	--	--
MCNP	0.09 (0.00, 0.26)	--	0.10 (0.02, 0.22)	--	0.03 (0.0, 0.14)	--	--	--	--
TCS	0.07 (0.00, 0.20)	--	0.04 (0.00, 0.17)	--	0.06 (0.0, 0.14)	--	--	--	--
2,5-DCP	0.07 (0.00, 0.21)	--	0.07 (0.00, 0.17)	--	0.04 (0.0, 0.18)	--	--	--	--
2,4-DCP	0.06 (0.00, 0.17)	--	0.07 (0.00, 0.20)	--	0.02 (0.0, 0.09)	--	--	--	--
Propylparaben	0.01 (0.00, 0.06)	--	0.02 (0.00, 0.07)	--	0.07 (0.00, 0.026)	--	--	--	--
BPS	0.08 (0.00, 0.20)	--	0.02 (0.00, 0.08)	--	0.15 (0.01, 0.35)	--	--	--	--
ΣDBP	0.06 (0.00, 0.17)	--	0.06 (0.00, 0.15)	--	0.00 (0.0, 0.03)	--	--	--	--
MCPP	0.02 (0.00, 0.12)	--	0.01 (0.0, 0.06)	--	0.02 (0.0, 0.11)	--	--	--	--
ΣDiNP	0.04 (0.00, 0.18)	--	0.02 (0.0, 0.07)	--	0.02 (0.0, 0.07)	--	--	--	--

Negative and positive WQSR covariate-adjusted models evaluated associations of the chemical biomarker mixture with plasma hormones. All models account for educational attainment, age, diet quality, pre-pregnancy body mass index, perceived stress in early pregnancy, lifetime smoking status, parity, race/ethnicity, gestational age at plasma hormone assessment, and fetal sex. Bold signifies values that met WQS threshold ($> 1/19$). Models without bolded weights should be interpreted with caution. Models without reported weights did not converge. ΣDEHP, sum of di-2-ethylhexyl phthalate metabolites; ΣDEHTP, sum of di-2-ethylhexyl terephthalate metabolites; ΣDiNP, sum of di-isononyl phthalate metabolites; ΣDiBP, sum of di-iso-butyl phthalate metabolites; ΣDiNCH, sum of di(isononyl) cyclohexane-1,2-dicarboxylate metabolites; BPA, bisphenol A; BPS, bisphenol S; BPF, bisphenol F; TCS, triclosan; 2,4-DCP, 2,4-dichlorophenol; 2,5-DCP, 2,5-dichlorophenol; WQSR, weighted quantile sum regression.

Table S18. Relative weights (95% Confidence Intervals) from weighted quantile sums regression models evaluating associations of the EDC biomarkers mixture with thyroid hormones.

	Free T4			Total T4			TSH		
	All women (n=294)	Carrying females (n=150)	Carrying males (n=144)	All women (n=294)	Carrying females (n=150)	Carrying males (n=144)	All women (n=294)	Carrying females (n=150)	Carrying males (n=144)
Negatively Constrained WQSR Model									
Biomarker	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
BP-3	0.07 (0.00, 0.18)	0.04 (0.00, 0.14)	0.08 (0.00, 0.21)	0.02 (0.00, 0.08)	--	0.03 (0.00, 0.11)	0.02 (0.00, 0.08)	0.05 (0.00, 0.23)	0.01 (0.00, 0.06)
ΣDEHTP	0.03 (0.00, 0.13)	0.03 (0.00, 0.14)	0.04 (0.00, 0.16)	0.04 (0.00, 0.16)	--	0.05 (0.00, 0.13)	0.04 (0.00, 0.15)	0.04 (0.00, 0.15)	0.05 (0.00, 0.14)
BPA	0.06 (0.00, 0.20)	0.08 (0.00, 0.22)	0.04 (0.00, 0.11)	0.03 (0.00, 0.11)	--	0.02 (0.00, 0.09)	0.13 (0.02, 0.28)	0.10 (0.01, 0.23)	0.07 (0.01, 0.18)
MEP	0.03 (0.00, 0.09)	0.08 (0.00, 0.22)	0.03 (0.00, 0.09)	0.08 (0.00, 0.22)	--	0.06 (0.00, 0.17)	0.03 (0.00, 0.15)	0.03 (0.00, 0.14)	0.07 (0.00, 0.18)
Ethylparaben	0.12 (0.01, 0.27)	0.13 (0.01, 0.28)	0.07 (0.01, 0.17)	0.09 (0.00, 0.25)	--	0.04 (0.00, 0.14)	0.10 (0.01, 0.25)	0.05 (0.00, 0.18)	0.12 (0.02, 0.27)
Methylparaben	0.02 (0.00, 0.07)	0.03 (0.00, 0.11)	0.03 (0.00, 0.11)	0.05 (0.00, 0.16)	--	0.08 (0.00, 0.22)	0.06 (0.00, 0.20)	0.08 (0.00, 0.22)	0.06 (0.00, 0.18)
ΣDiNCH	0.04 (0.00, 0.15)	0.06 (0.00, 0.23)	0.06 (0.00, 0.17)	0.09 (0.01, 0.27)	--	0.11 (0.02, 0.24)	0.07 (0.00, 0.18)	0.08 (0.00, 0.19)	0.05 (0.00, 0.14)
ΣDiBP	0.06 (0.00, 0.19)	0.03 (0.00, 0.12)	0.07 (0.01, 0.18)	0.14 (0.02, 0.31)	--	0.12 (0.03, 0.23)	0.07 (0.00, 0.19)	0.09 (0.01, 0.26)	0.03 (0.00, 0.12)
MBzP	0.04 (0.00, 0.19)	0.06 (0.00, 0.19)	0.02 (0.00, 0.07)	0.00 (0.00, 0.03)	--	0.02 (0.00, 0.08)	0.01 (0.00, 0.07)	0.03 (0.00, 0.10)	0.02 (0.00, 0.08)
ΣDEHP	0.06 (0.00, 0.21)	0.09 (0.00, 0.25)	0.03 (0.00, 0.11)	0.05 (0.00, 0.18)	--	0.04 (0.00, 0.12)	0.01 (0.00, 0.07)	0.01 (0.00, 0.05)	0.04 (0.00, 0.11)
MCNP	0.05 (0.00, 0.15)	0.04 (0.00, 0.18)	0.07 (0.00, 0.23)	0.04 (0.00, 0.15)	--	0.03 (0.00, 0.10)	0.04 (0.00, 0.14)	0.04 (0.00, 0.13)	0.06 (0.00, 0.16)
TCS	0.13 (0.02, 0.27)	0.06 (0.00, 0.22)	0.17 (0.05, 0.29)	0.11 (0.02, 0.26)	--	0.13 (0.03, 0.24)	0.06 (0.00, 0.19)	0.06 (0.00, 0.17)	0.06 (0.00, 0.17)
2,5-DCP	0.03 (0.00, 0.14)	0.13 (0.02, 0.28)	0.01 (0.00, 0.06)	0.01 (0.00, 0.05)	--	0.03 (0.00, 0.11)	0.10 (0.01, 0.25)	0.03 (0.00, 0.11)	0.17 (0.06, 0.32)
2,4-DCP	0.00 (0.00, 0.03)	0.00 (0.00, 0.03)	0.02 (0.00, 0.06)	0.01 (0.00, 0.07)	--	0.01 (0.00, 0.04)	0.03 (0.00, 0.10)	0.04 (0.00, 0.17)	0.02 (0.00, 0.08)
Propylparaben	0.02 (0.00, 0.10)	0.01 (0.00, 0.06)	0.04 (0.00, 0.13)	0.04 (0.00, 0.15)	--	0.07 (0.00, 0.20)	0.07 (0.00, 0.19)	0.06 (0.00, 0.21)	0.04 (0.00, 0.13)
BPS	0.11 (0.01, 0.23)	0.06 (0.00, 0.22)	0.09 (0.01, 0.20)	0.13 (0.04, 0.29)	--	0.12 (0.03, 0.24)	0.10 (0.01, 0.24)	0.14 (0.03, 0.28)	0.04 (0.00, 0.11)
ΣDBP	0.04 (0.00, 0.15)	0.02 (0.00, 0.11)	0.04 (0.00, 0.12)	0.03 (0.00, 0.12)	--	0.02 (0.00, 0.09)	0.00 (0.00, 0.04)	0.03 (0.00, 0.11)	0.00 (0.00, 0.01)
MCPP	0.01 (0.00, 0.07)	0.02 (0.00, 0.10)	0.02 (0.00, 0.07)	0.02 (0.00, 0.08)	--	0.01 (0.00, 0.07)	0.02 (0.00, 0.07)	0.01 (0.00, 0.07)	0.02 (0.00, 0.09)
ΣDiNP	0.08 (0.00, 0.21)	0.03 (0.00, 0.15)	0.08 (0.01, 0.23)	0.02 (0.00, 0.10)	--	0.03 (0.00, 0.10)	0.05 (0.00, 0.14)	0.02 (0.00, 0.07)	0.07 (0.00, 0.17)
Positively Constrained WQSR Model									
Biomarker	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
BP-3	--	0.04 (0.00, 0.14)	--	0.12 (0.01, 0.26)	0.08 (0.01, 0.20)	0.09 (0.01, 0.24)	--	--	--
ΣDEHTP	--	0.06 (0.00, 0.19)	--	0.05 (0.0, 0.15)	0.05 (0.00, 0.16)	0.05 (0.00, 0.17)	--	--	--
BPA	--	0.06 (0.00, 0.18)	--	0.06 (0.00, 0.17)	0.06 (0.00, 0.14)	0.05 (0.00, 0.16)	--	--	--
MEP	--	0.03 (0.00, 0.14)	--	0.03 (0.00, 0.16)	0.02 (0.00, 0.07)	0.06 (0.00, 0.19)	--	--	--
Ethylparaben	--	0.03 (0.00, 0.13)	--	0.04 (0.00, 0.13)	0.02 (0.00, 0.11)	0.05 (0.00, 0.18)	--	--	--
Methylparaben	--	0.03 (0.00, 0.10)	--	0.03 (0.00, 0.13)	0.02 (0.00, 0.09)	0.03 (0.00, 0.11)	--	--	--
ΣDiNCH	--	0.05 (0.00, 0.16)	--	0.03 (0.00, 0.11)	0.03 (0.00, 0.12)	0.03 (0.00, 0.10)	--	--	--
DiBP	--	0.09 (0.00, 0.24)	--	0.00 (0.00, 0.04)	0.02 (0.00, 0.09)	0.02 (0.00, 0.10)	--	--	--
MBzP	--	0.03 (0.00, 0.11)	--	0.15 (0.01, 0.35)	0.14 (0.02, 0.30)	0.09 (0.00, 0.28)	--	--	--
ΣDEHP	--	0.03 (0.00, 0.12)	--	0.04 (0.00, 0.15)	0.06 (0.00, 0.20)	0.05 (0.00, 0.19)	--	--	--
MCNP	--	0.06 (0.00, 0.16)	--	0.04 (0.00, 0.15)	0.03 (0.00, 0.14)	0.07 (0.00, 0.20)	--	--	--
TCS	--	0.04 (0.00, 0.17)	--	0.01 (0.00, 0.06)	0.02 (0.00, 0.08)	0.02 (0.00, 0.09)	--	--	--
2,5-DCP	--	0.01 (0.00, 0.05)	--	0.15 (0.00, 0.29)	0.10 (0.01, 0.26)	0.10 (0.01, 0.24)	--	--	--
2,4-DCP	--	0.16 (0.02, 0.32)	--	0.09 (0.00, 0.24)	0.08 (0.01, 0.22)	0.08 (0.01, 0.21)	--	--	--
Propylparaben	--	0.10 (0.00, 0.24)	--	0.04 (0.00, 0.13)	0.10 (0.01, 0.35)	0.03 (0.00, 0.13)	--	--	--
BPS	--	0.07 (0.00, 0.19)	--	0.02 (0.00, 0.08)	0.07 (0.00, 0.17)	0.01 (0.00, 0.05)	--	--	--
ΣDBP	--	0.03 (0.00, 0.11)	--	0.02 (0.00, 0.11)	0.02 (0.00, 0.14)	0.06 (0.00, 0.27)	--	--	--
MCPP	--	0.05 (0.00, 0.17)	--	0.04 (0.00, 0.16)	0.02 (0.00, 0.11)	0.07 (0.00, 0.17)	--	--	--
ΣDiNP	--	0.04 (0.00, 0.16)	--	0.04 (0.00, 0.15)	0.06 (0.00, 0.19)	0.04 (0.00, 0.12)	--	--	--

Negative and positive WQSR covariate-adjusted models evaluated associations of the chemical biomarker mixture with plasma hormones. All models account for educational attainment, age, diet quality, pre-pregnancy body mass index, perceived stress in early pregnancy, lifetime smoking status, parity, race/ethnicity, gestational age at plasma hormone assessment, and fetal sex. Bold signifies values that met WQS threshold (> 1/19). Models without bolded weights should be interpreted with caution. Models without reported weights did not converge. T4, thyroxine; TSH, thyroid stimulating hormone; ΣDEHP, sum of di-2-ethylhexyl phthalate metabolites; ΣDEHTP, sum of di-2-ethylhexyl terephthalate metabolites; ΣDiNP, sum of di-isononyl phthalate metabolites; ΣDiBP, sum of di-iso-butyl phthalate metabolites; ΣDiNCH, sum of di(isononyl) cyclohexane-1,2-dicarboxylate metabolites; BPA, bisphenol A; BPS, bisphenol S; BPF, bisphenol F; TCS, triclosan; 2,4-DCP, 2,4-dichlorophenol; 2,5-DCP, 2,5-dichlorophenol; WQSR, weighted quantile sum regression.

Table S19. Posterior inclusion probabilities from Bayesian kernel machine regression evaluating associations of the EDC biomarkers mixture with mid-pregnancy hormones.

Biomarker	Progesterone			Estradiol			Testosterone			Free T4			Total T4			TSH		
	Overall (n=295)	Female (n=151)	Male (n=144)	Overall (n=295)	Female (n=150)	Male (n=145)	Overall (n=250)	Female (n=128)	Male (n=122)	Overall (n=294)	Female (n=150)	Male (n=144)	Overall (n=294)	Female (n=150)	Male (n=144)	Overall (n=294)	Female (n=150)	Male (n=144)
MCNP	0.30	0.25	0.37	0.44	0.34	0.40	0.41	0.32	0.32	0.20	0.28	0.54	0.24	0.24	0.63	0.48	0.17	0.34
MCP	0.33	0.25	0.33	0.44	0.39	0.33	0.52	0.31	0.34	0.19	0.34	0.55	0.21	0.28	0.55	0.49	0.19	0.46
MBzP	0.32	0.27	0.33	0.42	0.37	0.29	0.45	0.33	0.33	0.20	0.29	0.59	0.56	0.61	0.78	0.51	0.19	0.44
MEP	0.32	0.29	0.40	0.43	0.37	0.34	0.51	0.38	0.32	0.20	0.31	0.58	0.18	0.29	0.60	0.47	0.19	0.37
ΣDEHP	0.37	0.25	0.37	0.40	0.36	0.33	0.48	0.34	0.35	0.20	0.30	0.60	0.20	0.29	0.63	0.47	0.20	0.36
ΣDiNP	0.38	0.28	0.34	0.40	0.50	0.33	0.43	0.31	0.33	0.20	0.31	0.77	0.23	0.26	0.62	0.48	0.19	0.49
ΣDBP	0.33	0.24	0.37	0.45	0.42	0.32	0.44	0.32	0.34	0.19	0.27	0.55	0.25	0.29	0.59	0.50	0.20	0.45
ΣDiBP	0.32	0.25	0.33	0.45	0.35	0.34	0.42	0.34	0.31	0.19	0.30	0.52	0.27	0.25	0.72	0.49	0.50	0.36
ΣDiNCH	0.34	0.27	0.39	0.41	0.30	0.33	0.40	0.31	0.34	0.21	0.28	0.52	0.20	0.23	0.68	0.45	0.18	0.38
ΣDEHTP	0.32	0.40	0.34	0.40	0.35	0.30	0.46	0.32	0.38	0.20	0.27	0.63	0.18	0.24	0.55	0.45	0.18	0.35
BPA	0.33	0.30	0.35	0.42	0.95	0.41	0.45	0.42	0.36	0.23	0.29	0.56	0.20	0.25	0.57	0.54	0.23	0.39
BPS	0.32	0.27	0.37	0.41	0.45	0.35	0.50	0.34	0.35	0.20	0.28	0.55	0.22	0.26	0.79	0.48	0.21	0.35
Ethylparaben	0.32	0.30	0.33	0.42	0.29	0.35	0.43	0.34	0.35	0.21	0.30	0.53	0.19	0.29	0.61	0.47	0.23	0.38
Methylparaben	0.34	0.35	0.33	0.42	0.48	0.32	0.48	0.34	0.35	0.23	0.30	0.53	0.19	0.27	0.69	0.47	0.21	0.39
Propylparaben	0.36	0.29	0.36	0.41	0.75	0.33	0.69	0.53	0.36	0.22	0.35	0.51	0.18	0.30	0.63	0.50	0.22	0.38
BP-3	0.31	0.40	0.35	0.43	0.37	0.31	0.47	0.33	0.35	0.21	0.28	0.56	0.23	0.26	0.56	0.46	0.19	0.38
TCS	0.34	0.26	0.32	0.40	0.35	0.31	0.59	0.37	0.37	0.22	0.30	0.64	0.28	0.25	0.79	0.45	0.19	0.38
2,4-DCP	0.34	0.25	0.36	0.44	0.34	0.32	0.48	0.32	0.41	0.24	0.39	0.56	0.28	0.24	0.77	0.45	0.20	0.39
2,5-DCP	0.32	0.26	0.35	0.45	0.36	0.35	0.59	0.37	0.42	0.23	0.35	0.68	0.40	0.33	0.64	0.49	0.20	0.62

BKMR models were fit with 200,000 iterations and 50 knots accounting for educational attainment, age, diet quality, pre-pregnancy body mass index, perceived stress in early pregnancy, lifetime smoking status, parity, race/ethnicity, gestational age at plasma hormone assessment. Posterior inclusion probabilities generated. PIPs > 0.5 are bolded. Overall, all women; Female, women carrying females; Male, women carrying males; ΣDEHP, sum of di-2-ethylhexyl phthalate metabolites; ΣDEHTP, sum of di-2-ethylhexyl terephthalate metabolites; ΣDiNP, sum of di-isononyl phthalate metabolites; ΣDiBP, sum of di-iso-butyl phthalate metabolites; ΣDiNCH, sum of di(isononyl) cyclohexane-1,2-dicarboxylate metabolites; BPA, bisphenol A; BPS, bisphenol S; BPF, bisphenol F; TCS, triclosan; 2,4-DCP, 2,4-dichlorophenol; 2,5-DCP, 2,5-dichlorophenol; T4, thyroxine; TSH, thyroid stimulating hormone.

Table S20. Characteristics of I-KIDS women in analytic sample by nausea status (n=410).

Characteristic	All women (n=410)	Never nausea (n=39)	Typical nausea (n=166)	Persistent nausea (n=104)	Irregular nausea (n=101)	P
Race/Ethnicity			n (%)			0.69
Non-Hispanic White (ref)	336 (82.0)	31 (79.5)	140 (83.3)	82 (78.9)	83 (82.2)	
Others	74 (18.0)	8 (20.5)	26 (15.7)	22 (21.1)	18 (18.8)	
Education						0.09
Some college or less (ref)	61 (14.9)	7 (18.0)	16 (9.6)	21 (20.2)	17 (16.8)	
College graduate or higher	349 (85.1)	32 (82.0)	150 (90.4)	83 (79.8)	84 (83.2)	
Income						
<\$60,000	109 (26.7)	9 (23.0)	40 (24.3)	34 (33.0)	26 (25.7)	0.25
\$60,000-\$99,999	155 (38.0)	18 (46.2)	56 (33.9)	37 (35.9)	44 (43.6)	
>\$100,000	144 (35.3)	12 (30.8)	69 (41.8)	32 (31.1)	31 (30.7)	
Alcohol since conception						0.09
None (ref)	238 (58.2)	27 (69.2)	88 (53.0)	68 (65.4)	55 (55.0)	
Any alcohol consumed	171 (41.8)	12 (30.8)	78 (47.0)	36 (34.6)	45 (45.0)	
Parity						0.75
No children (ref)	217 (52.9)	22 (56.4)	92 (55.4)	52 (50.0)	51 (50.5)	
At least 1 child	193 (47.1)	17 (43.6)	74 (44.6)	52 (50.0)	50 (49.5)	
Conception Season						0.37
Winter (ref)	97 (23.6)	9 (23.1)	38 (22.9)	30 (28.9)	20 (19.8)	
Spring	107 (26.1)	9 (23.1)	40 (24.1)	31 (29.8)	27 (26.7)	
Summer	95 (23.2)	9 (23.1)	47 (28.3)	14 (13.5)	25 (24.8)	
Fall	111 (27.1)	12 (30.8)	41 (24.7)	29 (27.9)	29 (28.7)	
Fetal Sex						0.72
Male (ref)	197 (48.0)	22 (56.4)	80 (48.2)	48 (46.2)	47 (46.5)	
Female	213 (52.0)	17 (43.6)	86 (51.8)	56 (53.4)	54 (53.5)	
			Median (25th, 75th percentile)			
Maternal age (years)	30.0 (27.5, 32.7)	30.9 (27.4, 33.1)	30.2 (28.3, 32.5)	29.3 (26.9, 33.0)	29.7 (27.0, 32.6)	0.33
Pre-Pregnancy BMI (kg/m²)	24.5 (21.9, 29.1)	25.7 (21.9, 34.0)	23.9 (21.8, 27.1)	25.1 (21.9, 29.9)	24.5 (21.9, 30.2)	0.05
Early pregnancy AHEI-2010*	51.8 (45.3, 60.0)	51.7 (46.1, 56.0)	52.9 (46.4, 61.0)	49.1 (44.6, 58.5)	51.6 (41.5, 60.6)	0.17
Early pregnancy PSS-10	10.7 (6.8, 17.0)	8.1 (5.8, 10.2)	9.5 (6.1, 13.7)	13.2 (8.8, 16.8)	11.8 (7.8, 17.0)	<.0001
Gestational age at hormone collection	17.0 (16.4, 17.7)	17.1 (16.5, 17.6)	17.0 (16.4, 17.7)	17.0 (16.4, 17.7)	16.8 (16.1, 17.5)	0.16

*Alcohol intake was removed from the index (total score out of 100). Abbreviations: AHEI-2010: alternative healthy eating index 2010; PSS-10: perceived stress score 10.

Table S21. Distribution of mid-pregnancy gestational hormones by fetal sex (n=410).

	Reportable range	% \geq lower limit of reportable range	All women	Women carrying females	Women carrying males
Gestational hormone			Median (25th, 75th percentile)		
Progesterone, ng/mL	0.2 – 40.0	100	29.1 (24.3, 33.9)	27.8 (23.1, 32.8)	31.0 (26.0, 35.2)
Estradiol, pg/mL	20.0 – 2000.0	100	2727.5 (1955.0, 3660.0)	2690.0 (1925.0, 3660.0)	2737.5 (1960.0, 3660.0)
Testosterone, ng/dL	20.0 – 1600.0	83.0	44.1 (32.6, 64.4)	41.7 (32.0, 60.6)	45.0 (33.6, 68.8)
Free T4, ng/dL	0.3 - 0.6	100	0.9 (0.8, 1.0)	0.9 (0.8, 1.0)	0.9 (0.8, 1.0)
Total T4, μ g/dL	1.0 – 24.0	100	8.9 (8.0, 9.9)	8.9 (8.2, 9.8)	9.0 (8.0, 9.9)
TSH, μ IU/mL	Up to 75.0	99.8	1.8 (1.2, 2.5)	1.9 (1.3, 2.6)	1.8 (1.2, 2.4)
<p>*Values are outside of manufacturer's reportable range because estradiol was diluted 10x prior to analysis and machine-read values were multiplied by 10. Bolded values are statistically different by fetal sex.</p> <p>Abbreviations: TSH, thyroid stimulating hormone.</p>					

Table S23. Unadjusted associations of hormones and persistent nausea (n=410).

	Never nausea v typical nausea (n=205)	Persistence nausea v typical nausea (n=270)	Irregular nausea v typical nausea (n=267)
	Odds Ratio (95% Confidence Interval)		
Gestational hormone			
Progesterone	1.00 (0.89, 1.11)	1.00 (0.93, 1.08)	1.01 (0.94, 1.09)
Estradiol	1.01 (0.94, 1.08)	1.02 (0.97, 1.07)	0.99 (0.94, 1.04)
Testosterone	1.08 (1.00, 1.17)*	1.09 (1.03, 1.15)*	1.06 (1.00, 1.12)*
Free T4	1.04 (0.78, 1.38)	1.12 (0.91, 1.37)	1.00 (0.82, 1.23)
Total T4	1.03 (0.84, 1.26)	1.07 (0.93, 1.23)	0.99 (0.85, 1.14)
Thyroid Stimulating Hormone	0.96 (0.92, 1.01)	0.97 (0.93, 1.01)	0.99 (0.95, 1.03)
Data are presented as OR and 95% CI of never nausea, persistent nausea, or irregular nausea compared to typical nausea for a 10% increase in the hormone. Reference: typical nausea (n=166). Sample sizes: progesterone and estradiol (n=407); testosterone (n=326); FT4, TT4, TSH (n=407).			

Table S24. Associations of mid-pregnancy hormones with nausea during pregnancy by fetal sex (n=410).

	Never nausea v typical nausea (n=205)			<i>P</i> _{int}	Persistent nausea v typical nausea (n=270)			<i>P</i> _{int}	Irregular nausea v typical nausea (n=267)			
	Odds Ratio (95% Confidence Interval)				Odds Ratio (95% Confidence Interval)				Odds Ratio (95% Confidence Interval)			<i>P</i> _{int}
Gestational hormone	All women	Carrying females	Carrying males		All women	Carrying females	Carrying males		All women	Carrying females	Carrying males	
Progesterone	1.10 (0.96, 1.25)	0.96 (0.79, 1.17)	1.20 (1.02, 1.42)*	0.07	1.08 (0.98, 1.19)	1.11 (0.97, 1.26)	1.06 (0.92, 1.21)	0.60	1.08 (0.98, 1.19)	1.03 (0.90, 1.17)	1.17 (1.02, 1.34)	0.15
Estradiol	1.04 (0.96, 1.12)	1.03 (0.91, 1.16)	1.04 (0.95, 1.14)	0.85	1.03 (0.97, 1.09)	1.02 (0.94, 1.11)	1.03 (0.96, 1.11)	0.89	1.00 (0.95, 1.06)	0.97 (0.90, 1.05)	1.03 (0.95, 1.12)	0.28
Testosterone	1.09 (1.00, 1.18)*	1.07 (0.95, 1.21)	1.10 (0.99, 1.23)	0.72	1.06 (1.00, 1.13)	1.03 (0.94, 1.13)	1.09 (1.00, 1.19)*	0.39	1.03 (0.96, 1.09)	1.02 (0.93, 1.12)	1.03 (0.95, 1.12)	0.47
Free T4	1.19 (0.85, 1.66)	1.10 (0.68, 1.78)	1.18 (0.80, 1.74)	0.82	1.20 (0.93, 1.54)	1.19 (0.85, 1.67)	1.19 (0.87, 1.64)	0.99	1.07 (0.86, 1.34)	1.26 (0.92, 1.74)	0.91 (0.66, 1.24)	0.54
Total T4	1.00 (0.81, 1.24)	0.87 (0.64, 1.20)	1.13 (0.85, 1.49)	0.24	1.02 (0.87, 1.20)	1.00 (0.80, 1.24)	1.05 (0.84, 1.31)	0.75	0.95 (0.81, 1.10)	0.94 (0.75, 1.17)	0.95 (0.76, 1.18)	0.64
TSH	0.96 (0.92, 1.01)	0.98 (0.90, 1.08)	0.95 (0.90, 1.01)	0.57	0.97 (0.93, 1.01)	0.99 (0.93, 1.05)	0.96 (0.91, 1.01)	0.40	0.99 (0.95, 1.03)	0.98 (0.92, 1.04)	1.00 (0.94, 1.07)	0.92

Data are presented as OR and 95% CI of nausea outcome for a 10% increase in the hormone. Nausea type modeled with never nausea and persistent nausea compared to typical nausea (n=166). Fully adjusted models accounted for maternal age, race/ethnicity, education level, alcohol since conception, diet quality, perceived stress score, pre-pregnancy body mass index, conception season, and fetal sex.

Sample sizes: progesterone (n=385; f=197; m=188) and estradiol (n=385; F=196; M=189); testosterone (n=311; f=154; m=157); FT4, TT4, TSH (n=384; f=196; m=188). Some women are missing covariate information. Progesterone, estradiol, FT4, TT4, TSH (n=23; diet quality: n=18; stress score: n=4; alcohol: n=1); testosterone (n=15; diet quality: n=10, stress score: n=4; alcohol: n=1).

Abbreviations: *P*_{int}: interaction p value; TSH, thyroid stimulating hormone.

Table S25. WQSR weights for mid-pregnancy gestational hormones models in all women and by fetal sex (n=311).

Group	All women		Women carrying females		Women carrying males	
WQSR Constraint	Positive	Negative	Positive	Negative	Positive	Negative
Hormones	Never nausea v typical nausea (n=157)					
Testosterone	0.30	X	^a 0.20	X	0.38	X
Progesterone	0.24	X	^a 0.20	X	0.14	X
Free T4	0.19	X	^a 0.27	X	0.12	X
Total T4	0.12	X	^a 0.11	X	0.22	X
TSH	0.07	X	^a 0.09	X	0.08	X
Estradiol	0.07	X	^a 0.13	X	0.07	X
OR (95% CI)	1.26 (0.90, 1.76)	No - β	^a 1.11 (0.57, 2.17)	^a No - β	1.36 (0.57, 3.29)	No - β
Hormones	Persistent nausea v typical nausea (n=202)					
Free T4	0.27	X	0.20	0.15	0.18	X
Testosterone	0.21	X	0.14	0.19	0.27	X
Progesterone	0.18	X	0.20	0.11	0.13	X
Total T4	0.14	X	0.13	0.22	0.19	X
Estradiol	0.11	X	0.12	0.19	0.16	X
TSH	0.09	X	0.22	0.14	0.07	X
OR (95% CI)	1.23 (0.93, 1.64)	No - β	1.04 (0.71, 1.52)	1.23 (0.79, 1.91)	1.32 (0.82, 2.13)	No - β
Hormones	Irregular nausea v typical nausea (n=202)					
Progesterone	0.37	0.04	0.20	0.15	0.36	X
Testosterone	0.19	0.10	0.24	0.10	0.14	X
Free T4	0.16	0.18	0.23	0.13	0.08	X
Total T4	0.15	0.18	0.13	0.22	0.13	X
TSH	0.07	0.32	0.11	0.24	0.16	X
Estradiol	0.05	0.20	0.09	0.16	0.13	X
OR (95% CI)	1.10 (0.86, 1.41)	1.03 (0.82, 1.29)	0.93 (0.66, 1.32)	1.07 (0.74, 1.57)	1.17 (0.79, 1.73)	No - β
Weights and OR (95% CI) from WQSR models. All models account for maternal age, race/ethnicity, education level, alcohol since conception, diet quality, conception season, perceived stress score, pre-pregnancy body mass index, and fetal sex. Bold weights signify values >1/# of hormones in models with potentially meaningful results. ^a Fully adjusted models did not converge; estimates and weights from models without educational attainment and conception season.						
Sample sizes: Never nausea versus typical nausea (female: n=77; male: n=80), persistent nausea versus typical nausea (female: n= 101; male: n=101), irregular nausea versus typical nausea (female: n= 100; male: n=102).						
Abbreviations: CI: confidence interval; OR: odds ratio; TSH, thyroid stimulating hormone; X, no weights generated in model.						

Table S26. STROBE Statement—Checklist of items that should be included in reports of cohort studies.

	Item No	Recommendation	Section
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	Abstract
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	Abstract
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	1
Objectives	3	State specific objectives, including any prespecified hypotheses	1
Methods			
Study design	4	Present key elements of study design early in the paper	2.1
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	2
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up	2.1
		(b) For matched studies, give matching criteria and number of exposed and unexposed	N/A
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	2.2, 2.3, 2.4.1, 2.4.2, Supplemental Figure 2
Data sources/measurement	8	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	2.2-2.4
Bias	9	Describe any efforts to address potential sources of bias	2.2-2.4
Study size	10	Explain how the study size was arrived at	2.1, 2.4.1,
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	2.4
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	2.4
		(b) Describe any methods used to examine subgroups and interactions	2.4
		(c) Explain how missing data were addressed	2.3, 3.3
		(d) If applicable, explain how loss to follow-up was addressed	2.1
		(e) Describe any sensitivity analyses	2.4.5
Results			
Participants	13	(a) Report numbers of individuals at each stage of study—e.g. numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analyzed	3.1
		(b) Give reasons for non-participation at each stage	3.1
		(c) Consider use of a flow diagram	Supplemental Figure 1
Descriptive data	14	(a) Give characteristics of study participants (e.g. demographic, clinical, social) and information on exposures and potential confounders	3.1, Table 1, Supplemental Table 1
		(b) Indicate number of participants with missing data for each variable of interest	2.4.1, Table 1, Supplemental Figure 1
		(c) Summarize follow-up time (e.g., average and total amount)	2.4
Outcome data	15	Report numbers of outcome events or summary measures over time	3.2, Figure 1
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (e.g., 95% confidence interval). Make clear which confounders were adjusted for and why they were included	3.4, 3.5, Table 3, Supplemental Table 3
		(b) Report category boundaries when continuous variables were categorized	2.4, Table 1
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A
Other analyses	17	Report other analyses done—e.g. analyses of subgroups and interactions, and sensitivity analyses	3.4-3.5, Supplemental Tables 4
Discussion			
Key results	18	Summarize key results with reference to study objectives	4.1
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	4.4
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	4
Generalizability	21	Discuss the generalizability (external validity) of the study results	4
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	Included

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at <http://www.strobe-statement.org>.

Figure S1.

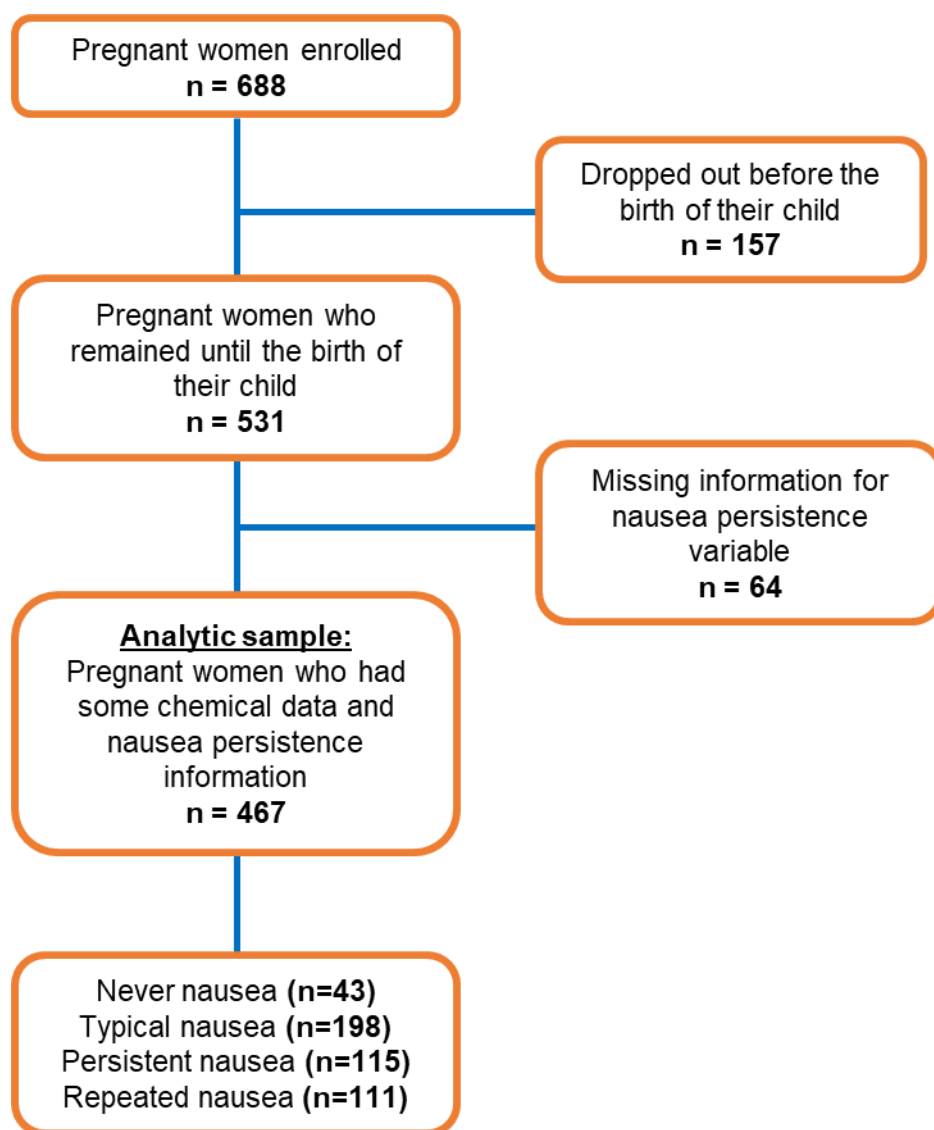


Figure S1. Analytic sample flowchart from pregnant women enrolled in I-KIDS (n=688) to the final analytic sample (n=467), with sample sizes by type of nausea.

Figure S2.

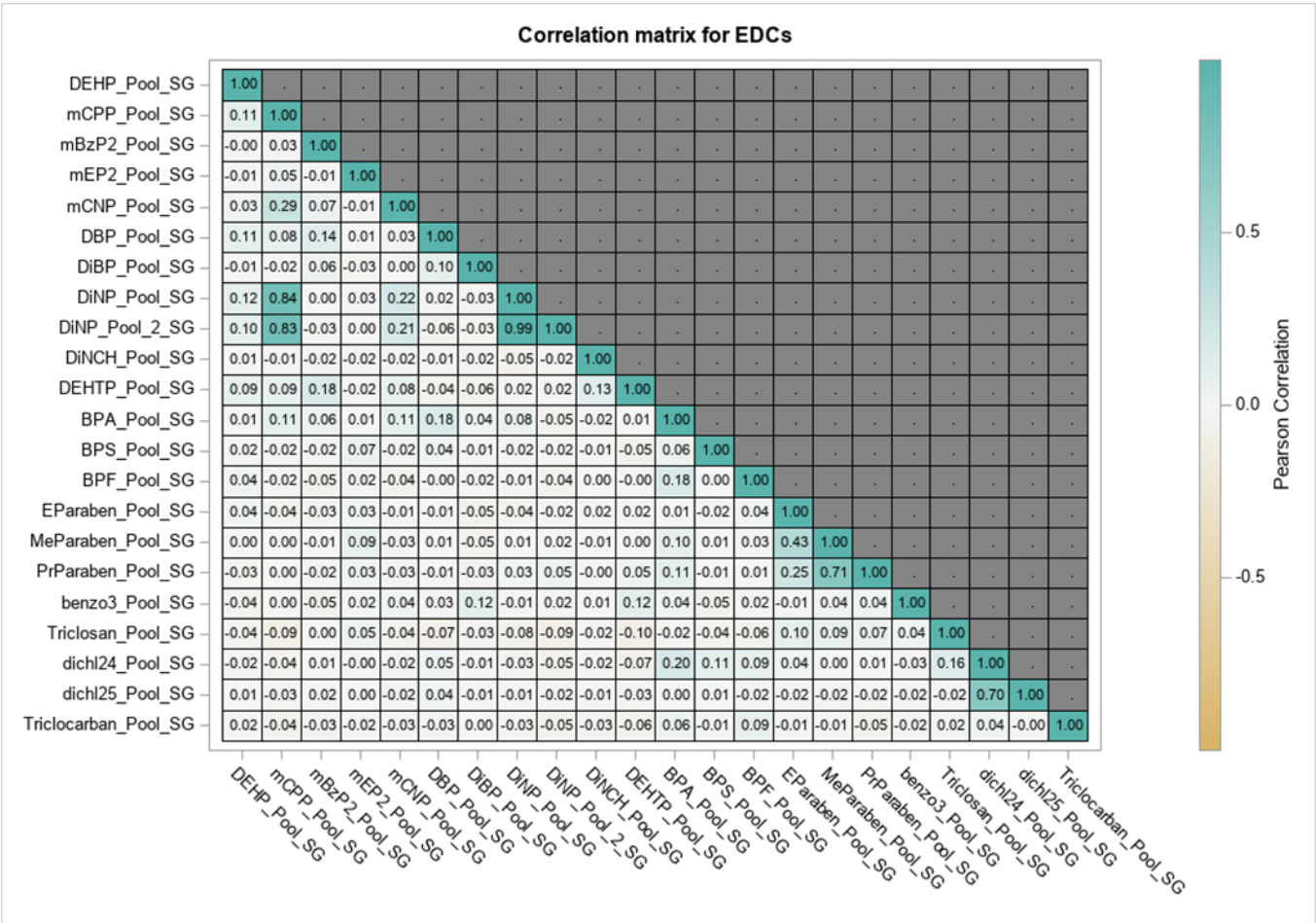


Figure S2. Correlation heatmap of all EDCs (n=467). Pearson correlation coefficients on heat map between all EDC biomarkers. Blue boxes represent positive correlations, while yellow boxes indicate positive correlations. Darker boxes represent stronger correlations (r closer to 1 or -1), while lighter boxes represent weaker correlations (r closer to 0).

Figure S3.

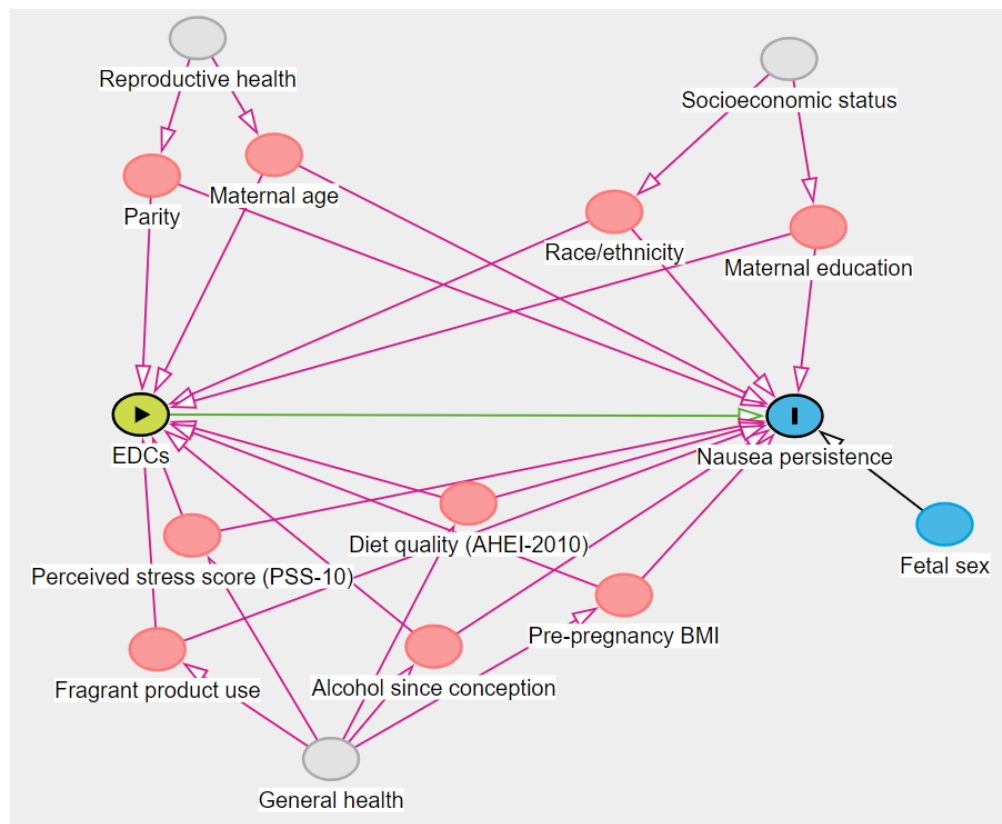


Figure S3. Directed acyclic graph of exposure-outcome relationship. Green circle represents the single EDC biomarkers and EDC mixture. The blue box represents our outcomes of interest (nausea during pregnancy) and any potential covariates that were associated with hormones. The red boxes represent potential confounders that were accounted for in all statistical models. The grey boxes represent potential latent variables. AHEI-2010, Alternative Healthy Eating Index 2010; PSS-10, perceived stress score 10.

Figure S4.

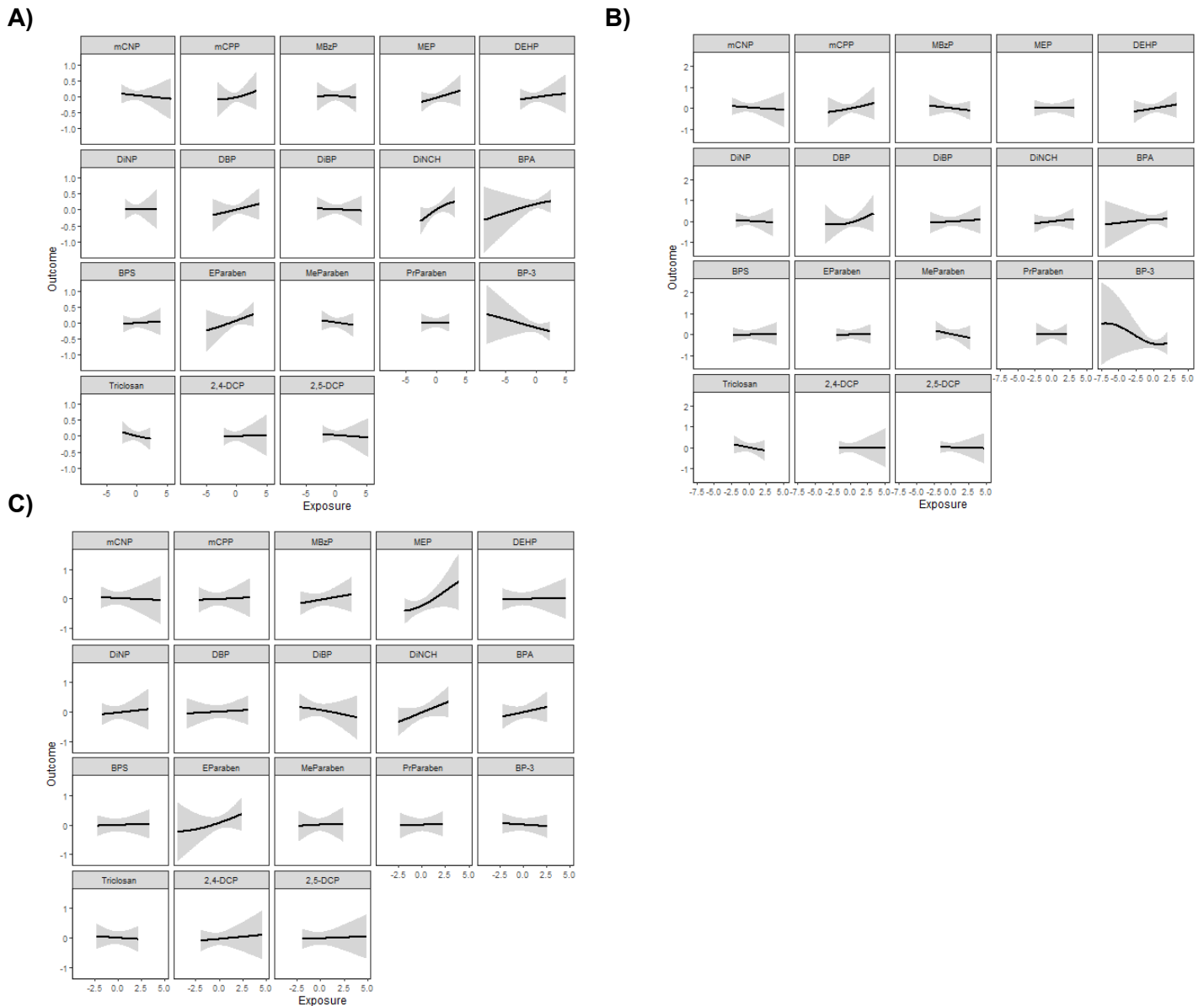


Figure S4. Associations of BKMR EDC mixture with persistent nausea: univariable dose-response relationships in A) all women, B) women carrying females, and C) women carrying males. Probit BKMR models fitted using 200,000 iterations to generate univariable plots. All models accounted for maternal age, race/ethnicity, educational attainment, diet quality, fragrant product use, pre-pregnancy BMI, early pregnancy stress, alcohol since conception, parity, and fetal sex. Models were stratified by fetal sex to estimate association in women carrying females and males.

Figure S5.

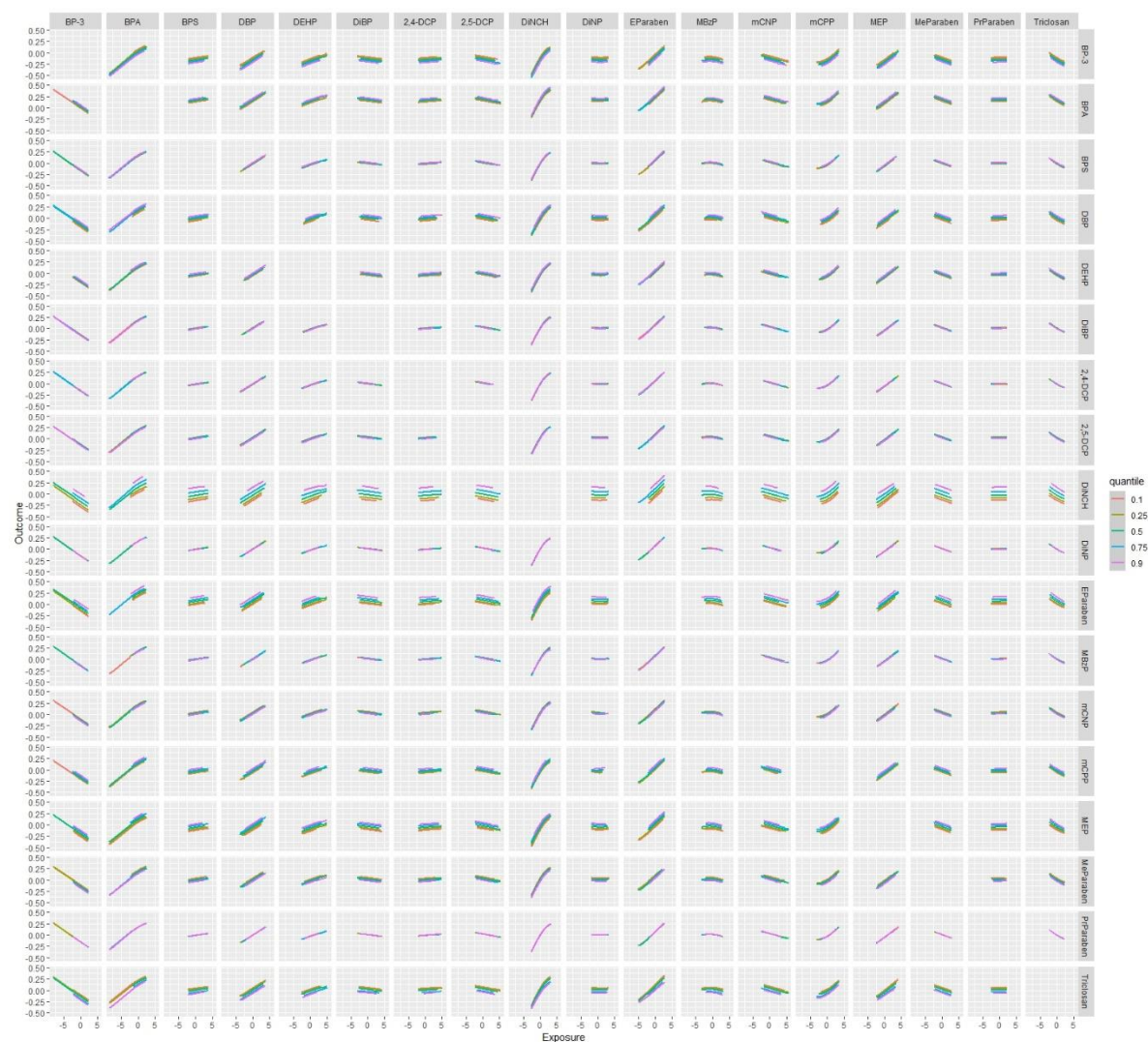


Figure S5. BKMR bivariable dose-response relationships of EDCs with persistent nausea in all women. Probit BKMR models fitted using 200,000 iterations. All models accounted for maternal age, race/ethnicity, educational attainment, diet quality, fragrant product use, pre-pregnancy BMI, early pregnancy stress, alcohol since conception, parity, and fetal sex.

Figure S6.

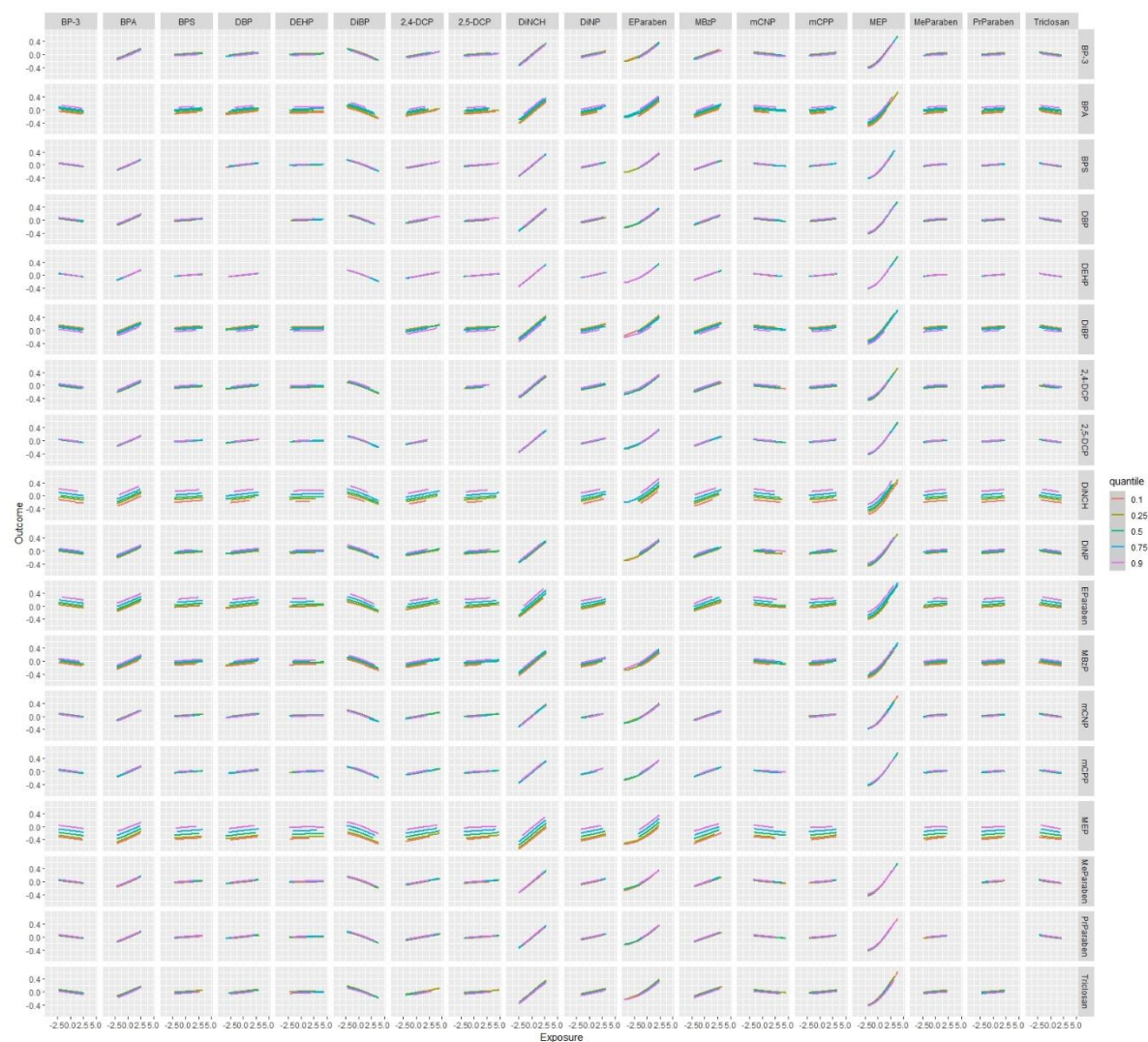


Figure S6. BKMR bivariable dose-response relationships of EDCs with persistent nausea in women carrying females. Probit BKMR models fitted using 200,000 iterations. All models accounted for maternal age, race/ethnicity, educational attainment, diet quality, fragrant product use, pre-pregnancy BMI, early pregnancy stress, alcohol since conception, and parity.

Figure S7.

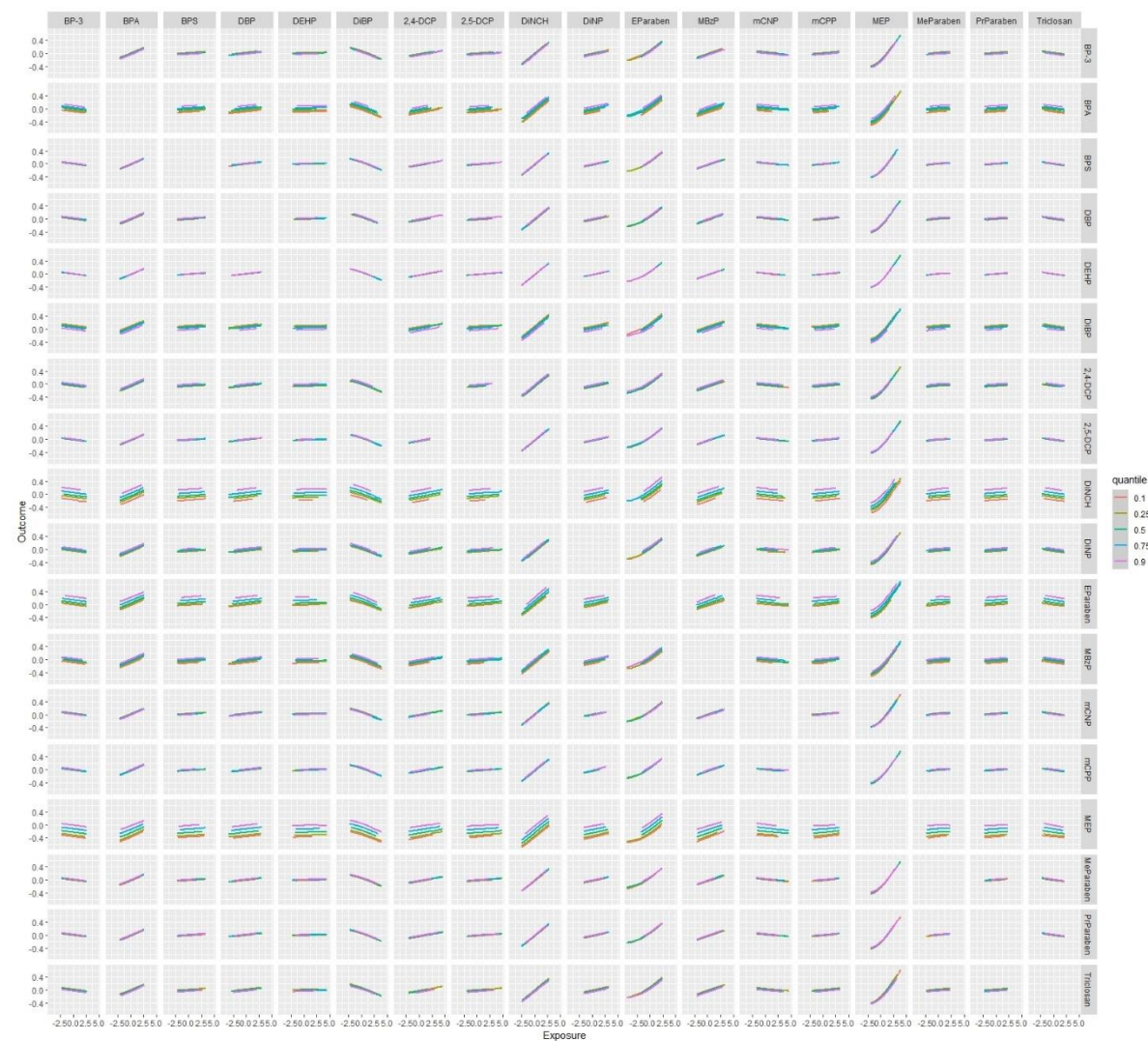


Figure S7. BKMR bivariable dose-response relationships of EDCs with persistent nausea in women carrying males. Probit BKMR models fitted using 200,000 iterations. All models accounted for maternal age, race/ethnicity, educational attainment, diet quality, fragrant product use, pre-pregnancy BMI, early pregnancy stress, alcohol since conception, and parity.

Figure S8.

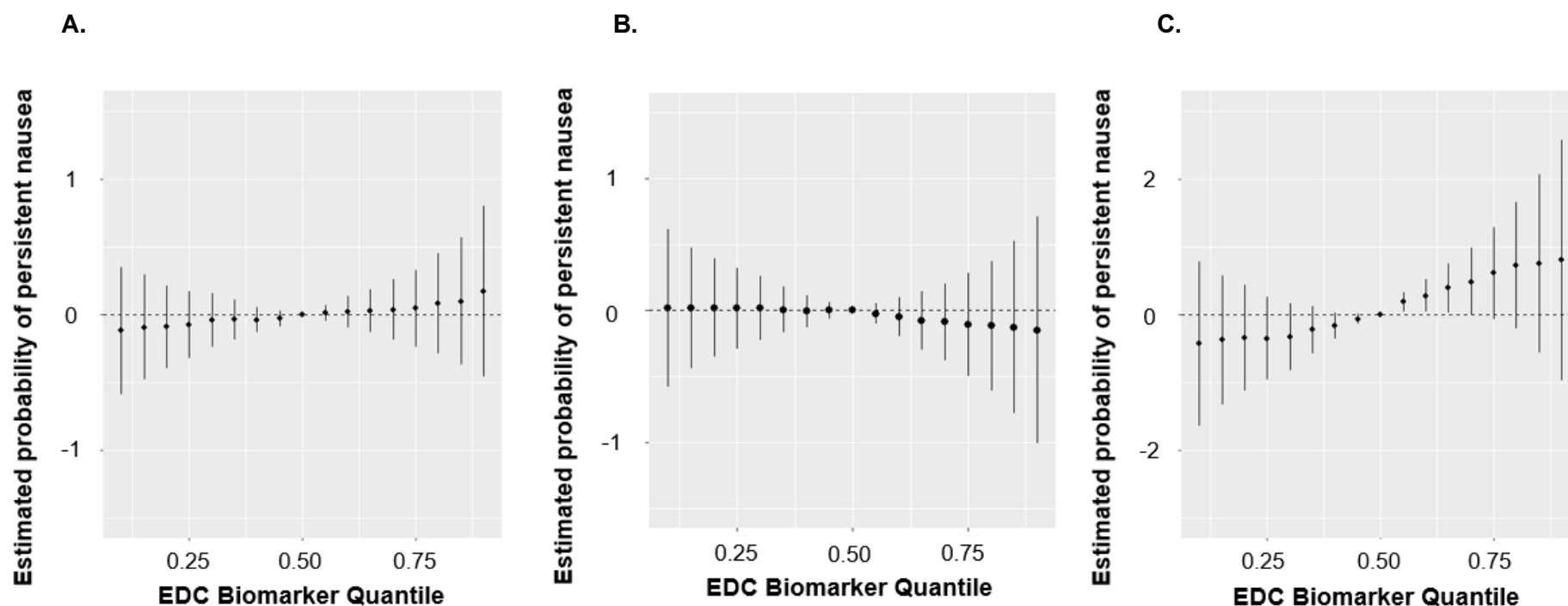


Figure S8. Associations of an EDC mixture with persistent nausea during pregnancy: Overall dose-response relationship using BKMR in A) all women, B) women carrying females, and C) women carrying males. Probit BKMR models were fit using 200,000 iterations to generate plots (estimates and 95% credible intervals at various quantiles of exposure relative to the median), which are interpreted as the estimated probability of persistent nausea as the EDC biomarker mixture concentration increases. Mixture includes Σ DEHP and DiNP (three metabolites). All models accounted for maternal age, race/ethnicity, educational attainment, diet quality, fragrant product use, pre-pregnancy BMI, early pregnancy stress, alcohol since conception, parity, and fetal sex. Models were stratified by fetal sex to estimate association in women carrying females and males. Sample size: 209. Abbreviations: BKMR, Bayesian kernel machine regression; EDC, endocrine disrupting chemical.

Figure S9.

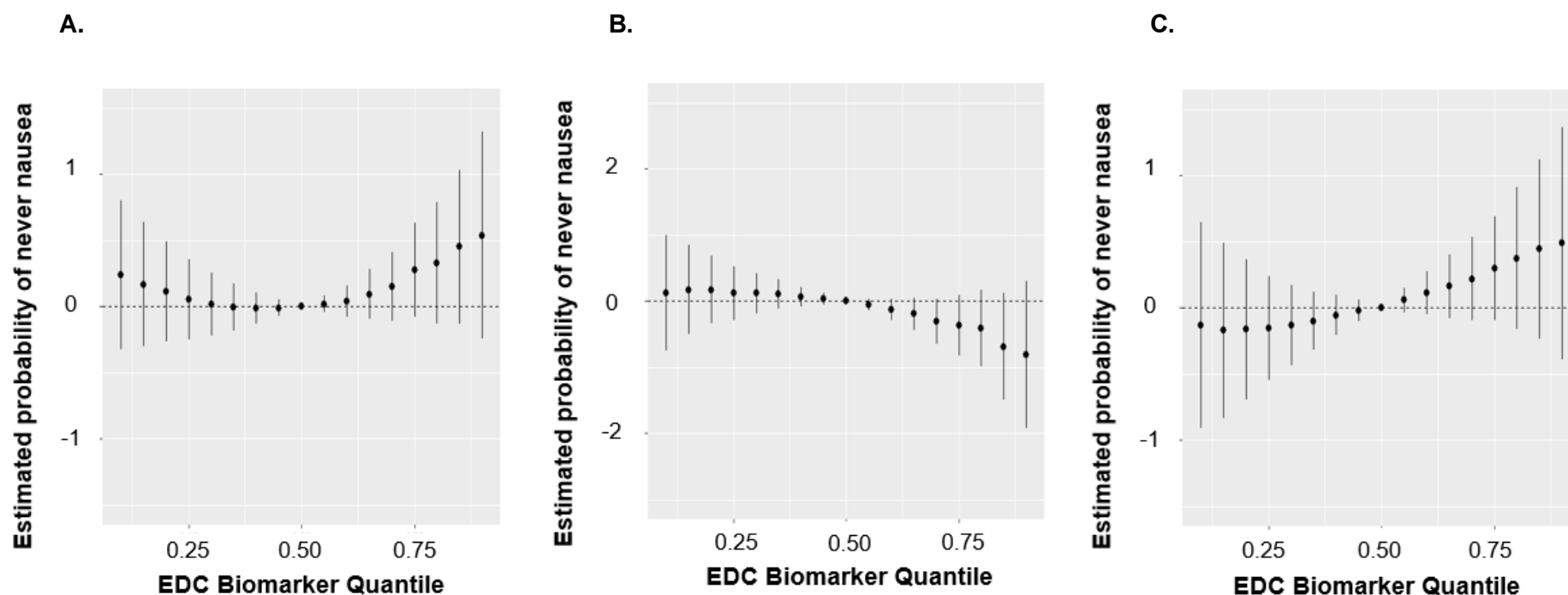


Figure S9. Associations of an EDC mixture with never nausea during pregnancy: Overall dose-response relationship using BKMR in A) all women, B) women carrying females, and C) women carrying males. Probit BKMR models were fit using 200,000 iterations to generate plots (estimates and 95% credible intervals at various quantiles of exposure relative to the median), which are interpreted as the estimated probability of persistent nausea as the EDC biomarker mixture concentration increases. Mixture does not include Σ DEHP and DiNP (three metabolites). All models accounted for maternal age, race/ethnicity, educational attainment, diet quality, fragrant product use, pre-pregnancy BMI, early pregnancy stress, alcohol since conception, parity, and fetal sex. Models were stratified by fetal sex to estimate association in women carrying females and males. Sample size: 231. Abbreviations: BKMR, Bayesian kernel machine regression; EDC, endocrine disrupting chemical.

Figure S10.

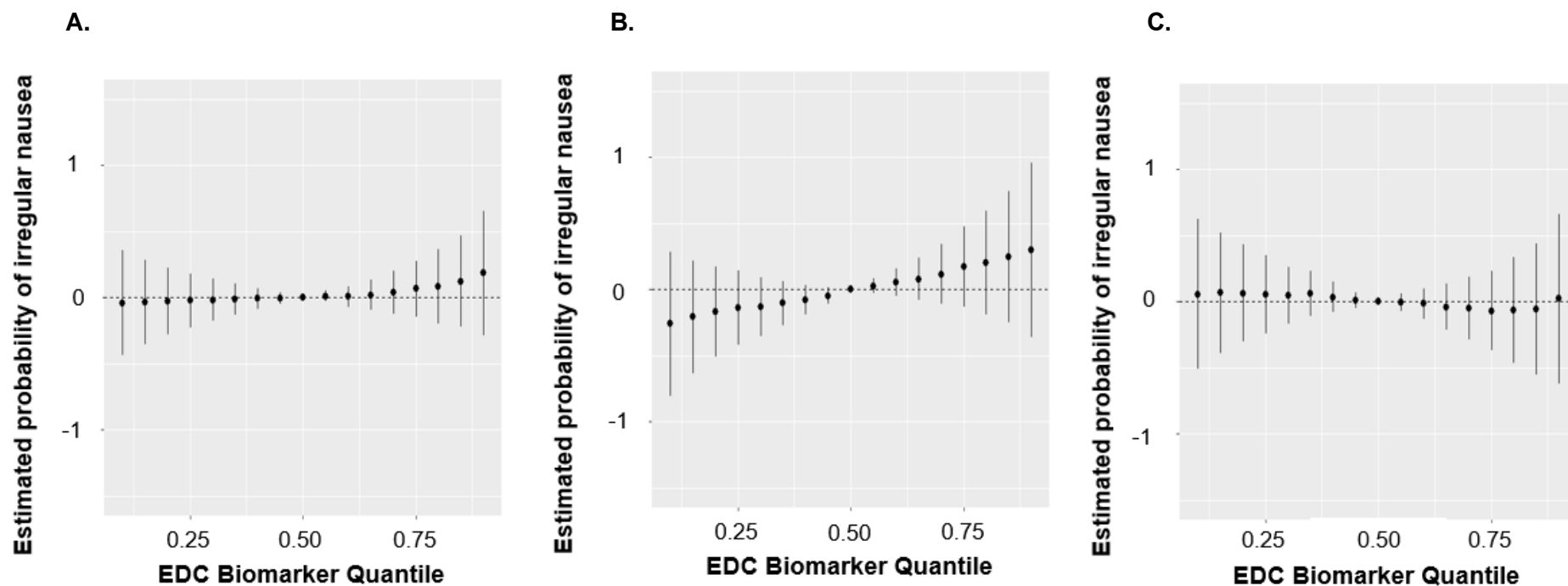


Figure S10. Associations of an EDC mixture with irregular nausea during pregnancy: Overall dose-response relationship using BKMR in A) all women, B) women carrying females, and C) women carrying males. Probit BKMR models were fit using 200,000 iterations to generate plots (estimates and 95% credible intervals at various quantiles of exposure relative to the median), which are interpreted as the estimated probability of persistent nausea as the EDC biomarker mixture concentration increases. Mixture does not include Σ DEHP and DiNP (three metabolites). All models accounted for maternal age, race/ethnicity, educational attainment, diet quality, fragrant product use, pre-pregnancy BMI, early pregnancy stress, alcohol since conception, parity, and fetal sex. Models were stratified by fetal sex to estimate association in women carrying females and males. Sample size: 292. Abbreviations: BKMR, Bayesian kernel machine regression; EDC, endocrine disrupting chemical.

Figure S11.

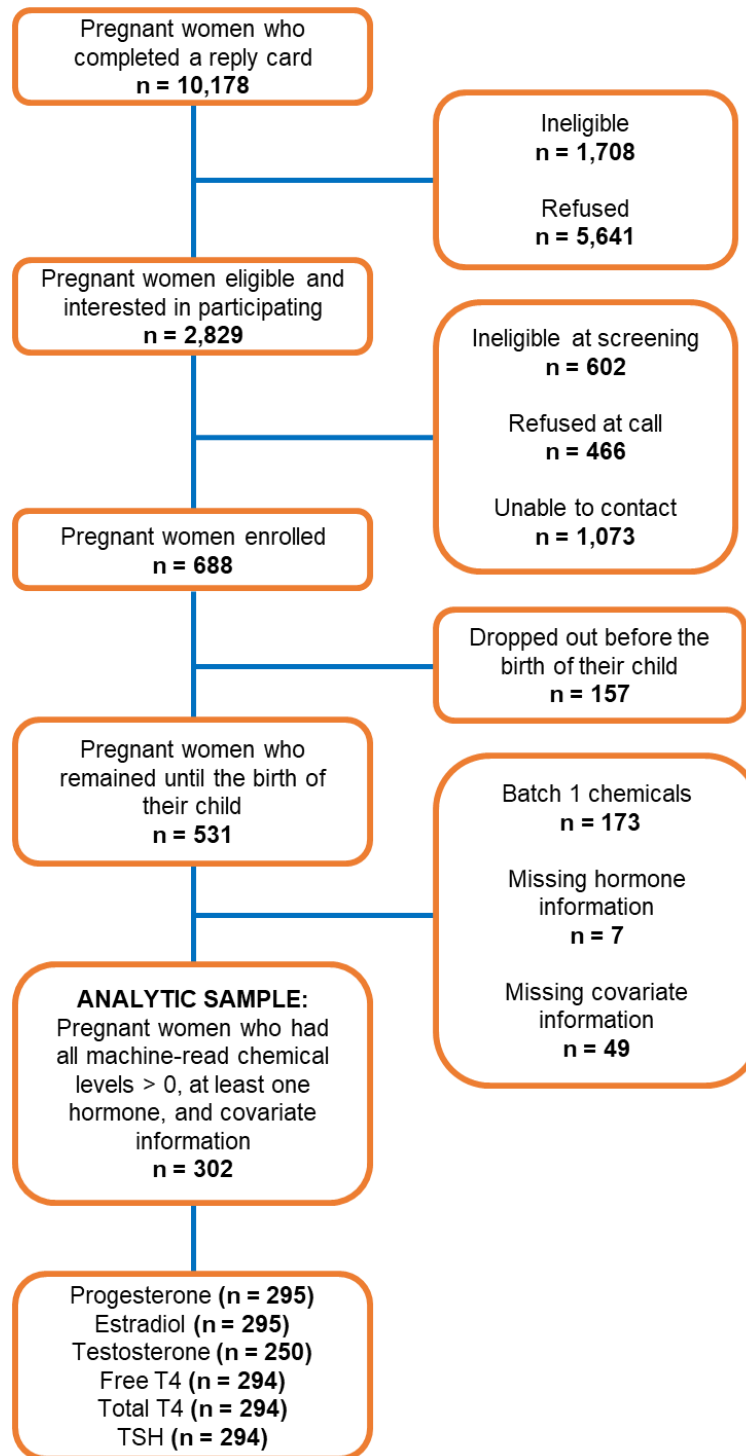


Figure S11. Flowchart of analytic sample derivation from reference population, including total sample size for each investigated chemical exposure and hormone outcome relationship.

Figure S12.

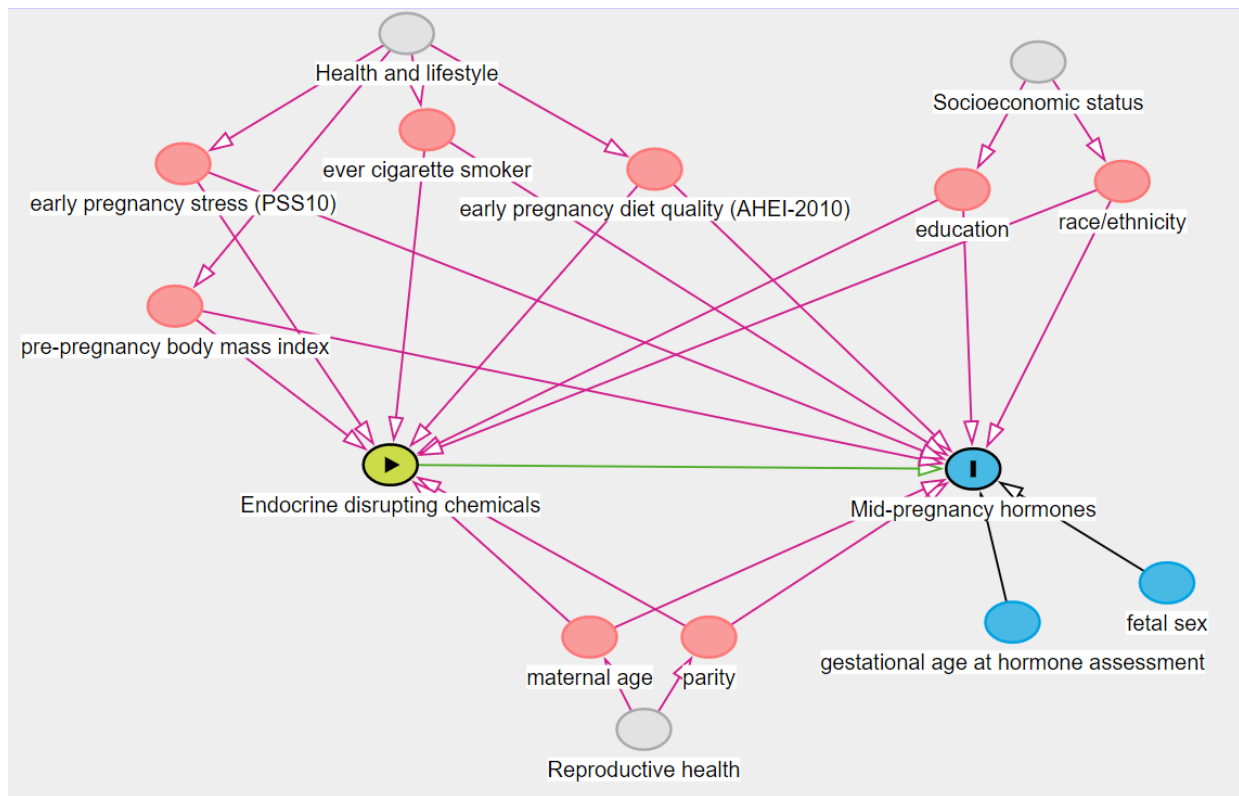


Figure S12. Directed acyclic graph of exposure-outcome relationship. Green box represents the single pollutant EDCs and EDC mixtures. The blue box represents our outcomes of interest (gestational mid-pregnancy hormone concentrations) and any potential covariates that were associated with hormones. The red boxes represent potential confounders that were accounted for in all statistical models. The grey boxes represent potential latent variables. AHEI-2010, Alternative Healthy Eating Index 2010; PSS10, perceived stress score 10.

Figure S13.

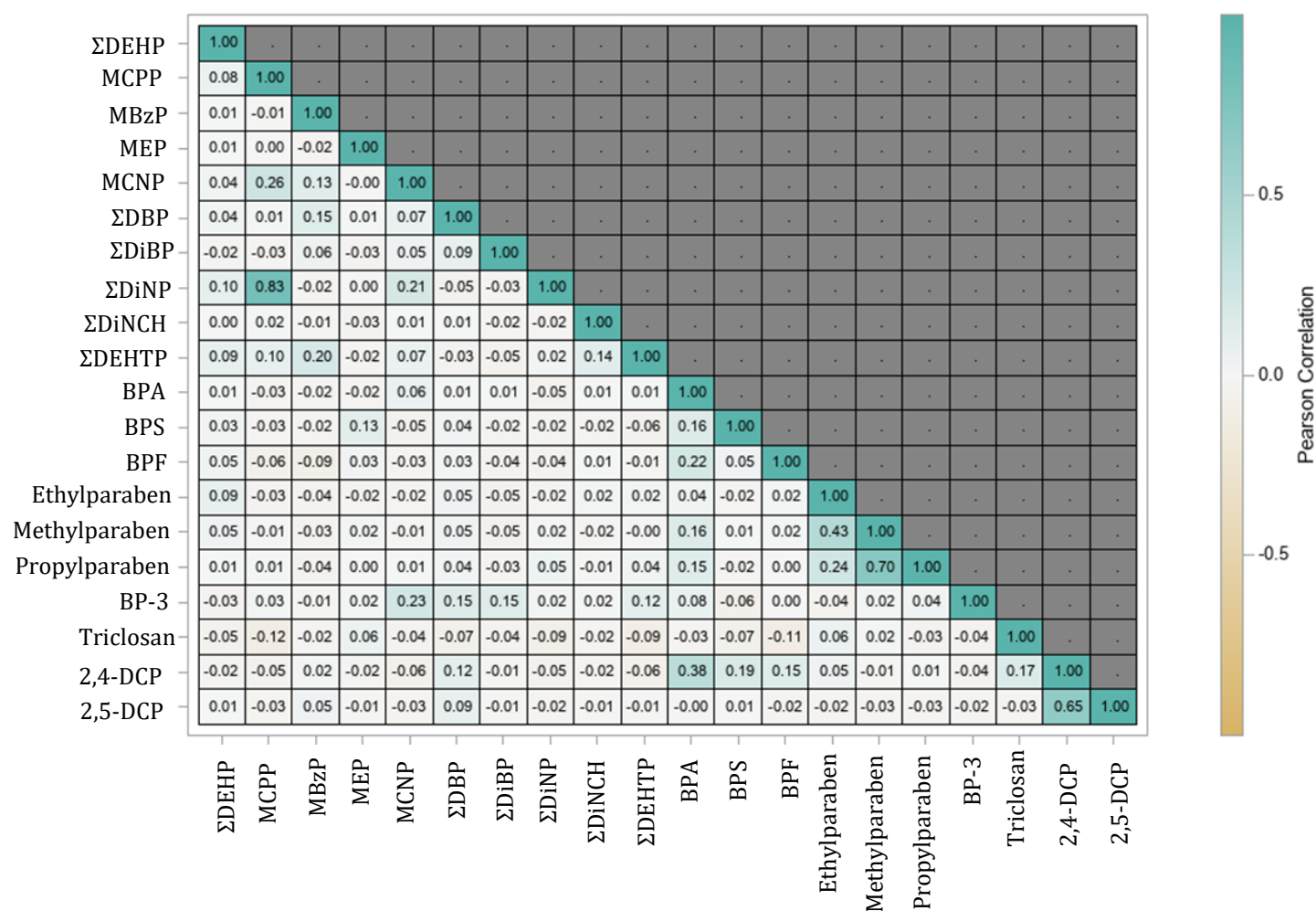


Figure S13. Correlation heatmap of all EDC biomarkers (n=302). Pearson correlation coefficients on heat map between all biomarkers. Yellow boxes represent negative correlations, while turquoise boxes represent positive correlations. Darker boxes represent stronger correlations (r closer to 1 or -1), while lighter boxes represent weaker correlations (r closer to 0).

Figure S14.

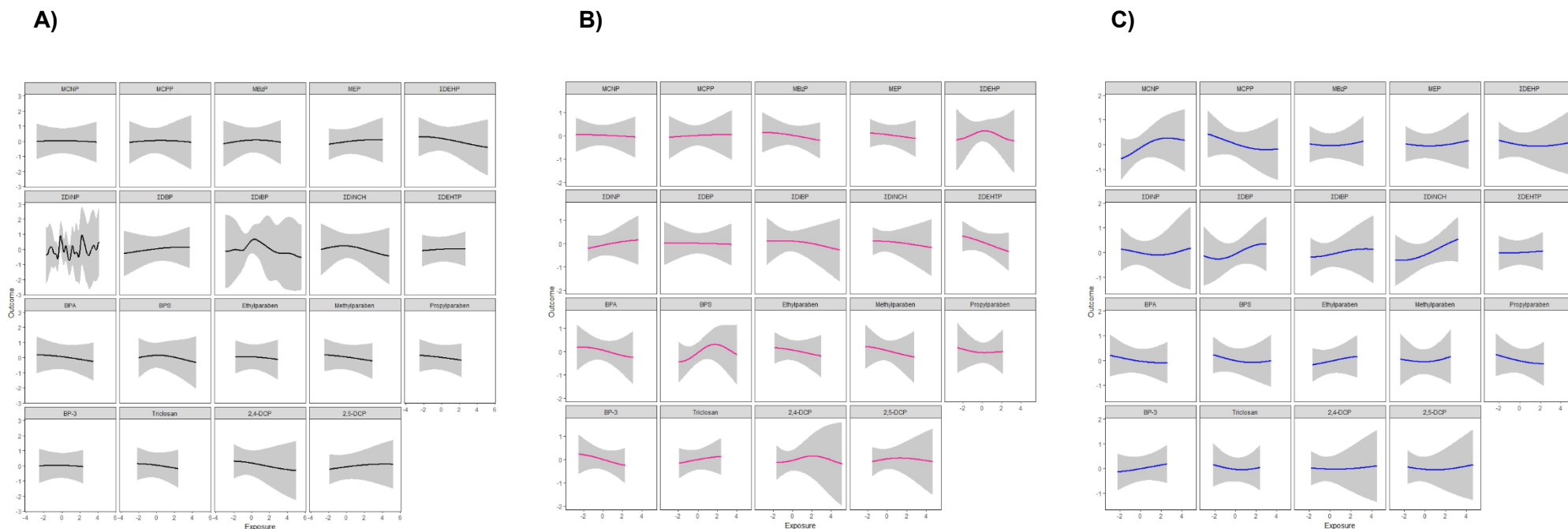


Figure S14. Univariable relationships between EDCs and progesterone in A) all women (n=295), B) women carrying females (n=151), and C) women carrying males (n=144). BKMR models were fit with 200,000 iterations and accounted for educational attainment, age, diet quality, pre-pregnancy body mass index, perceived stress in early pregnancy, lifetime smoking status, parity, race/ethnicity, gestational age at plasma hormone assessment. Plots are interpreted as the dose-response relationship of each EDC metabolite with a hormone while all other metabolites are fixed at their median concentration. Black represents all women, pink represents women carrying females, and blue represents women carrying males. BKMR, Bayesian kernel machine regression.

Figure S15.

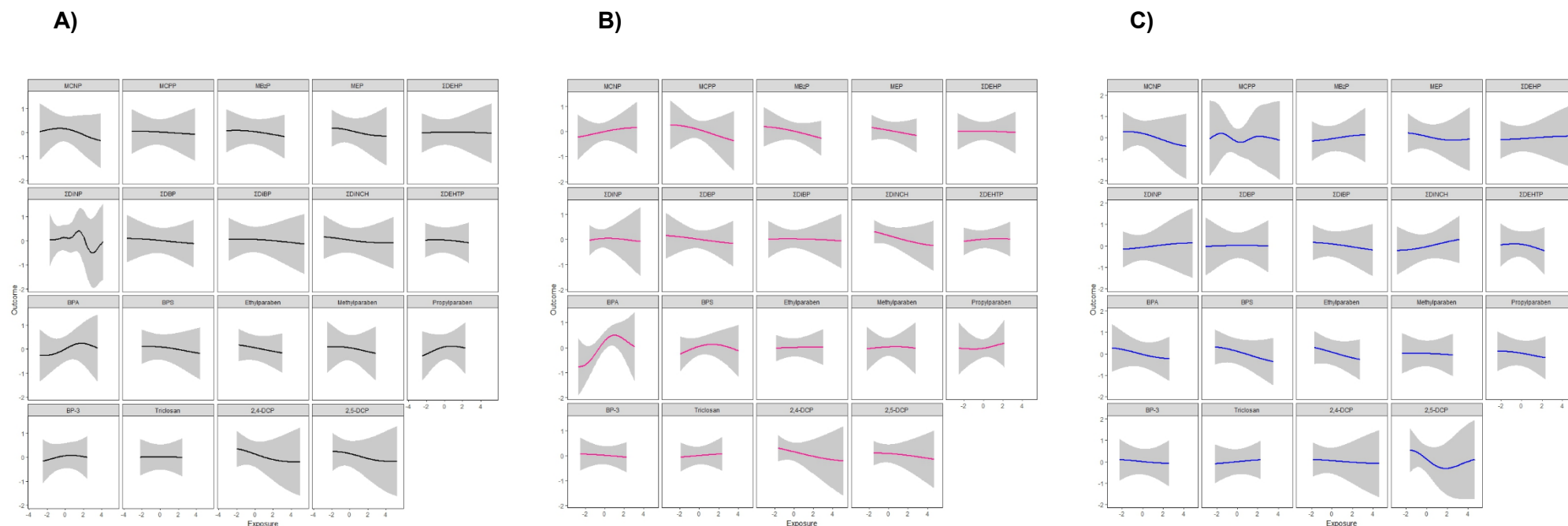


Figure S15. Univariable relationships between EDCs and estradiol in A) all women (n=295), B) women carrying females (n=150), and C) women carrying males (n=145). BKMR models were fit with 200,000 iterations and accounted for educational attainment, age, diet quality, pre-pregnancy body mass index, perceived stress in early pregnancy, lifetime smoking status, parity, race/ethnicity, gestational age at plasma hormone assessment. Plots are interpreted as the dose-response relationship of each EDC metabolite with a hormone while all other metabolites are fixed at their median concentration. Black represents all women, pink represents women carrying females, and blue represents women carrying males. BKMR, Bayesian kernel machine regression.

Figure S16.

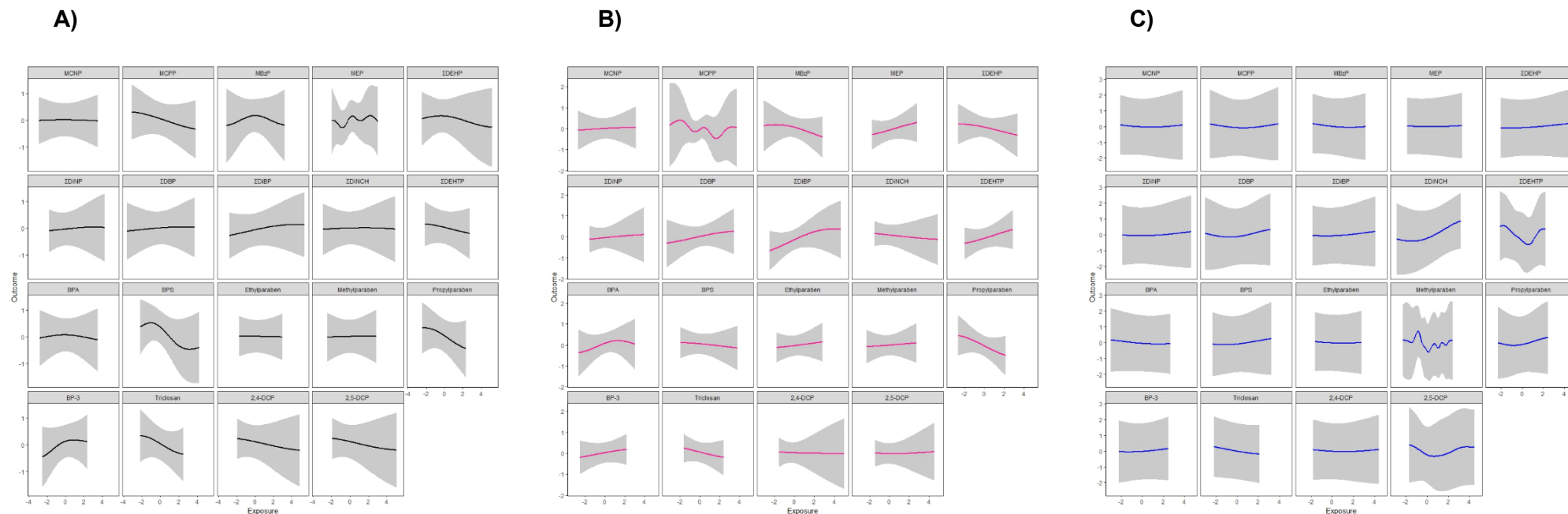


Figure S16. Univariable relationships between EDCs and testosterone in A) all women (n=250), B) women carrying females (n=128), and C) women carrying males (n=122). BKMR models were fit with 200,000 iterations and accounted for educational attainment, age, diet quality, pre-pregnancy body mass index, perceived stress in early pregnancy, lifetime smoking status, parity, race/ethnicity, gestational age at plasma hormone assessment. Plots are interpreted as the dose-response relationship of each EDC metabolite with a hormone while all other metabolites are fixed at their median concentration. Black represents all women, pink represents women carrying females, and blue represents women carrying males. BKMR, Bayesian kernel machine regression.

Figure S17.

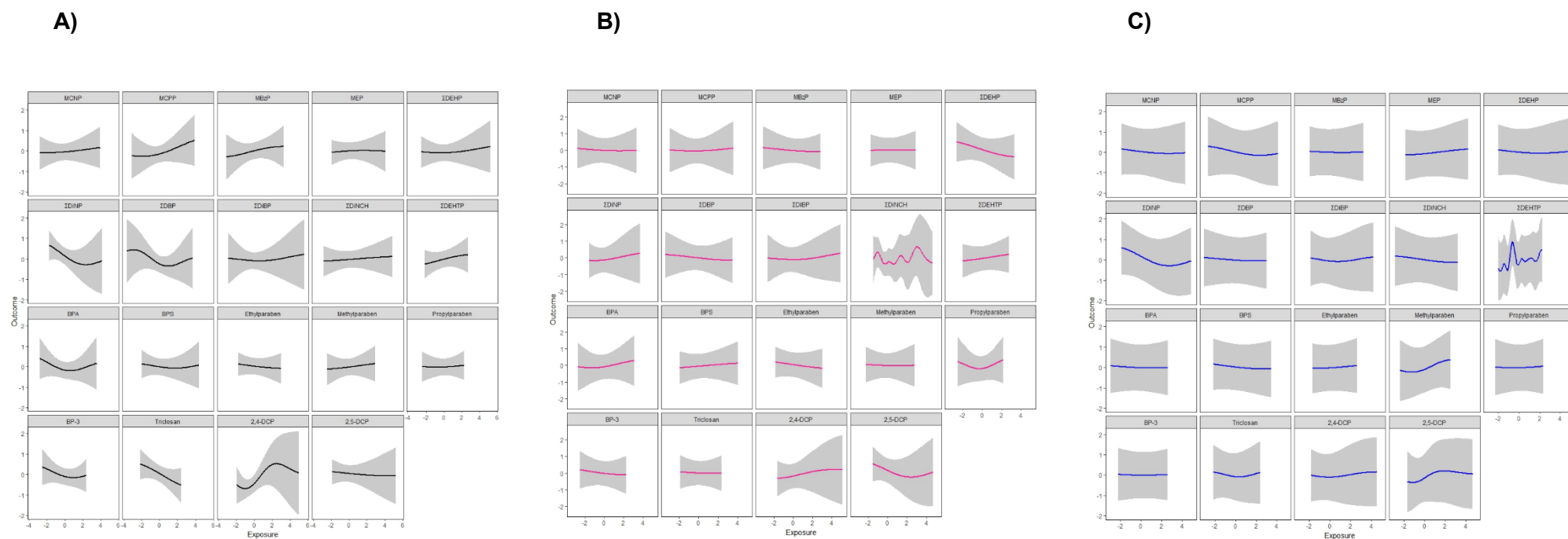


Figure S17. Univariable relationships between EDCs and FT4 in A) all women (n=294), B) women carrying females (n=150), and C) women carrying males (n=144). BKMR models were fit with 200,000 iterations and accounted for educational attainment, age, diet quality, pre-pregnancy body mass index, perceived stress in early pregnancy, lifetime smoking status, parity, race/ethnicity, gestational age at plasma hormone assessment. Plots are interpreted as the dose-response relationship of each EDC metabolite with a hormone while all other metabolites are fixed at their median concentration. Black represents all women, pink represents women carrying females, and blue represents women carrying males. BKMR, Bayesian kernel machine regression.

Figure S18.

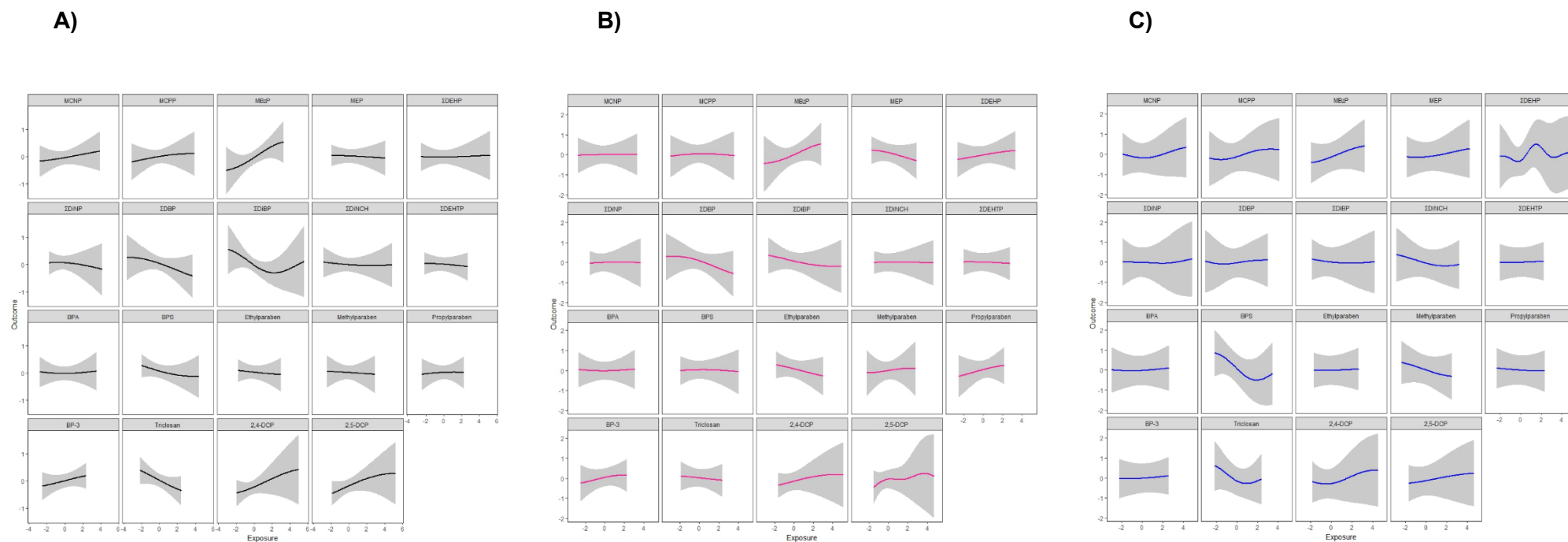


Figure S18. Univariable relationships between EDCs and TT4 in A) all women (n=294), B) women carrying females (n=150), and C) women carrying males (n=144). BKMR models were fit with 200,000 iterations and accounted for educational attainment, age, diet quality, pre-pregnancy body mass index, perceived stress in early pregnancy, lifetime smoking status, parity, race/ethnicity, gestational age at plasma hormone assessment. Plots are interpreted as the dose-response relationship of each EDC metabolite with a hormone while all other metabolites are fixed at their median concentration. Black represents all women, pink represents women carrying females, and blue represents women carrying males. BKMR, Bayesian kernel machine regression.

Figure S19.

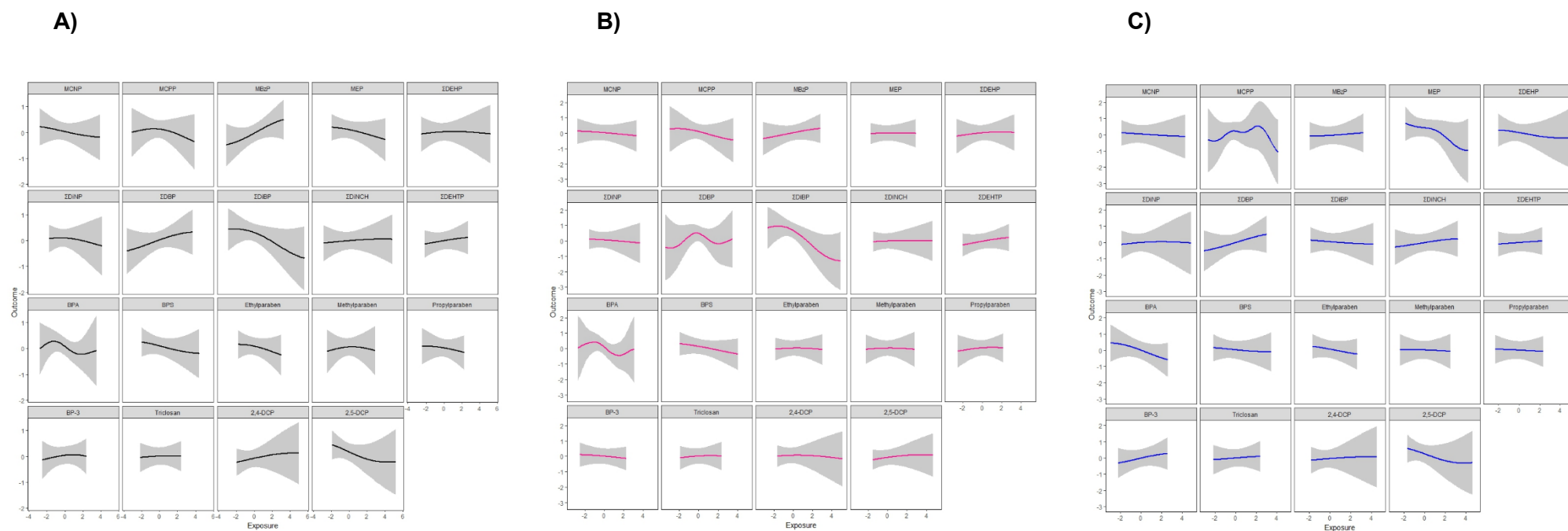


Figure S19. Univariable relationships between EDCs and TSH in A) all women (n=294), B) women carrying females (n=150), and C) women carrying males (n=144). BKMR models were fit with 200,000 iterations and accounted for educational attainment, age, diet quality, pre-pregnancy body mass index, perceived stress in early pregnancy, lifetime smoking status, parity, race/ethnicity, gestational age at plasma hormone assessment. Plots are interpreted as the dose-response relationship of each EDC metabolite with a hormone while all other metabolites are fixed at their median concentration. Black represents all women, pink represents women carrying females, and blue represents women carrying males. BKMR, Bayesian kernel machine regression.

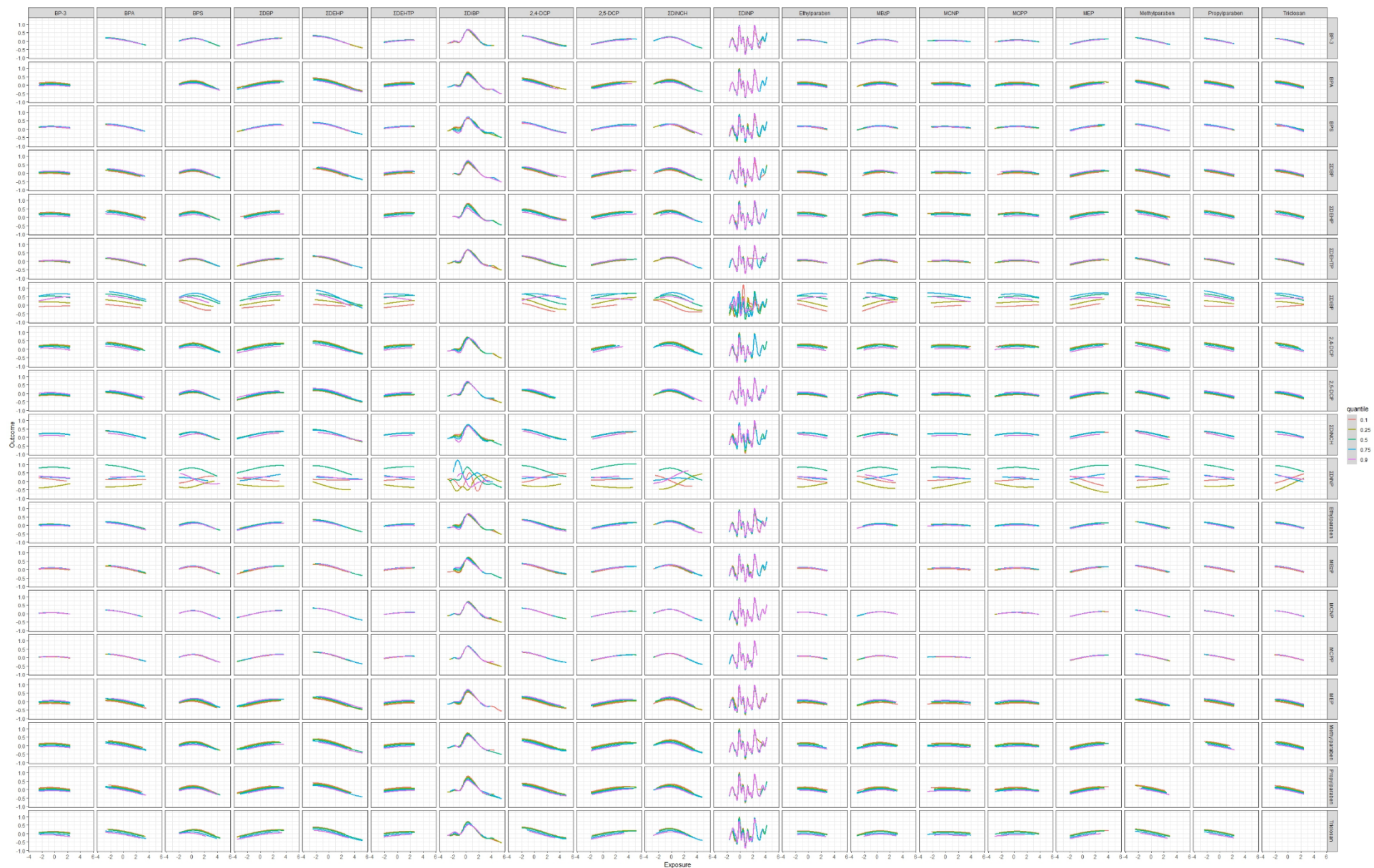


Figure S20. Bivariable EDC relationships with progesterone in all women. BKMR models were fit with 200,000 iterations and accounted for educational attainment, age, diet quality, pre-pregnancy body mass index, perceived stress in early pregnancy, lifetime smoking status, parity, race/ethnicity, gestational age at plasma hormone assessment. Bivariable plots interpreted as the dose-response relationship of each EDC metabolite with hormone while one other metabolite is fixed at various quantiles. BKMR, Bayesian kernel machine regression.

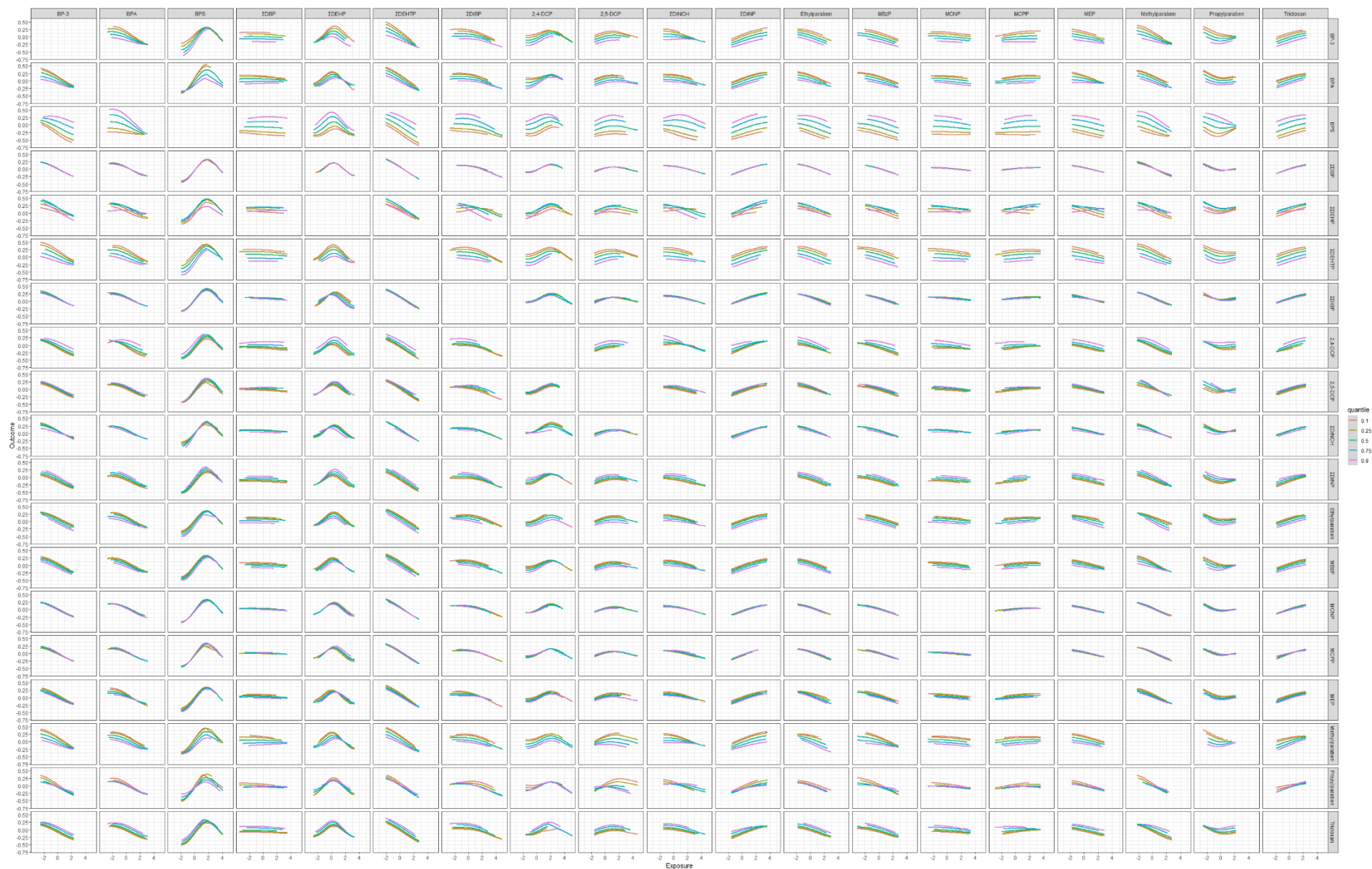


Figure S21. Bivariable EDC relationships with progesterone in women carrying females. BKMR models were fit with 200,000 iterations and accounted for educational attainment, age, diet quality, pre-pregnancy body mass index, perceived stress in early pregnancy, lifetime smoking status, parity, race/ethnicity, gestational age at plasma hormone assessment. Bivariable plots interpreted as the dose-response relationship of each EDC metabolite with hormone while one other metabolite is fixed at various quantiles. BKMR, Bayesian kernel machine regression.

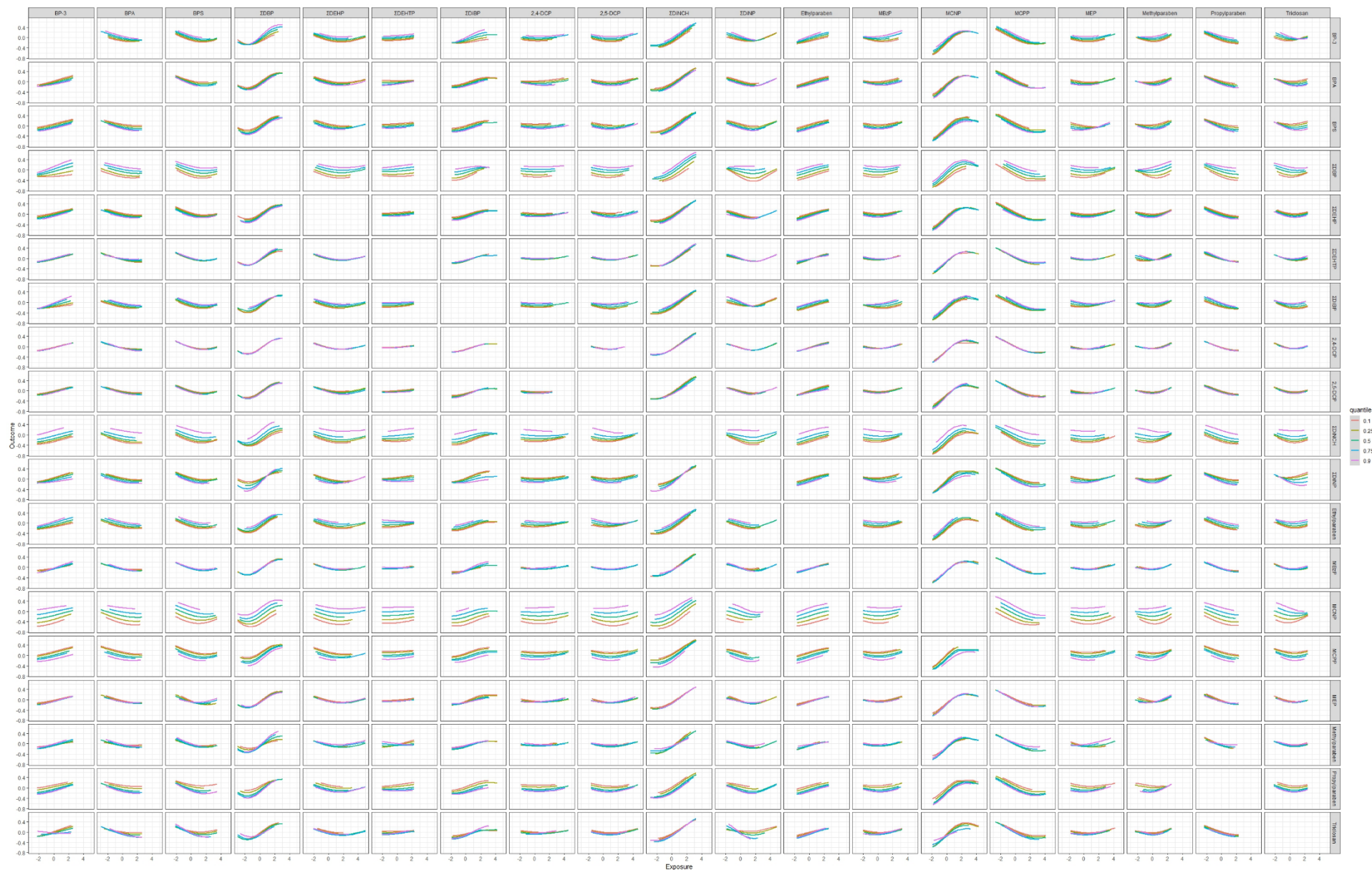


Figure S22. Bivariable EDC relationships with progesterone in women carrying males. BKMR models were fit with 200,000 iterations and accounted for educational attainment, age, diet quality, pre-pregnancy body mass index, perceived stress in early pregnancy, lifetime smoking status, parity, race/ethnicity, gestational age at plasma hormone assessment. Bivariable plots interpreted as the dose-response relationship of each EDC metabolite with hormone while one other metabolite is fixed at various quantiles. BKMR, Bayesian kernel machine regression.

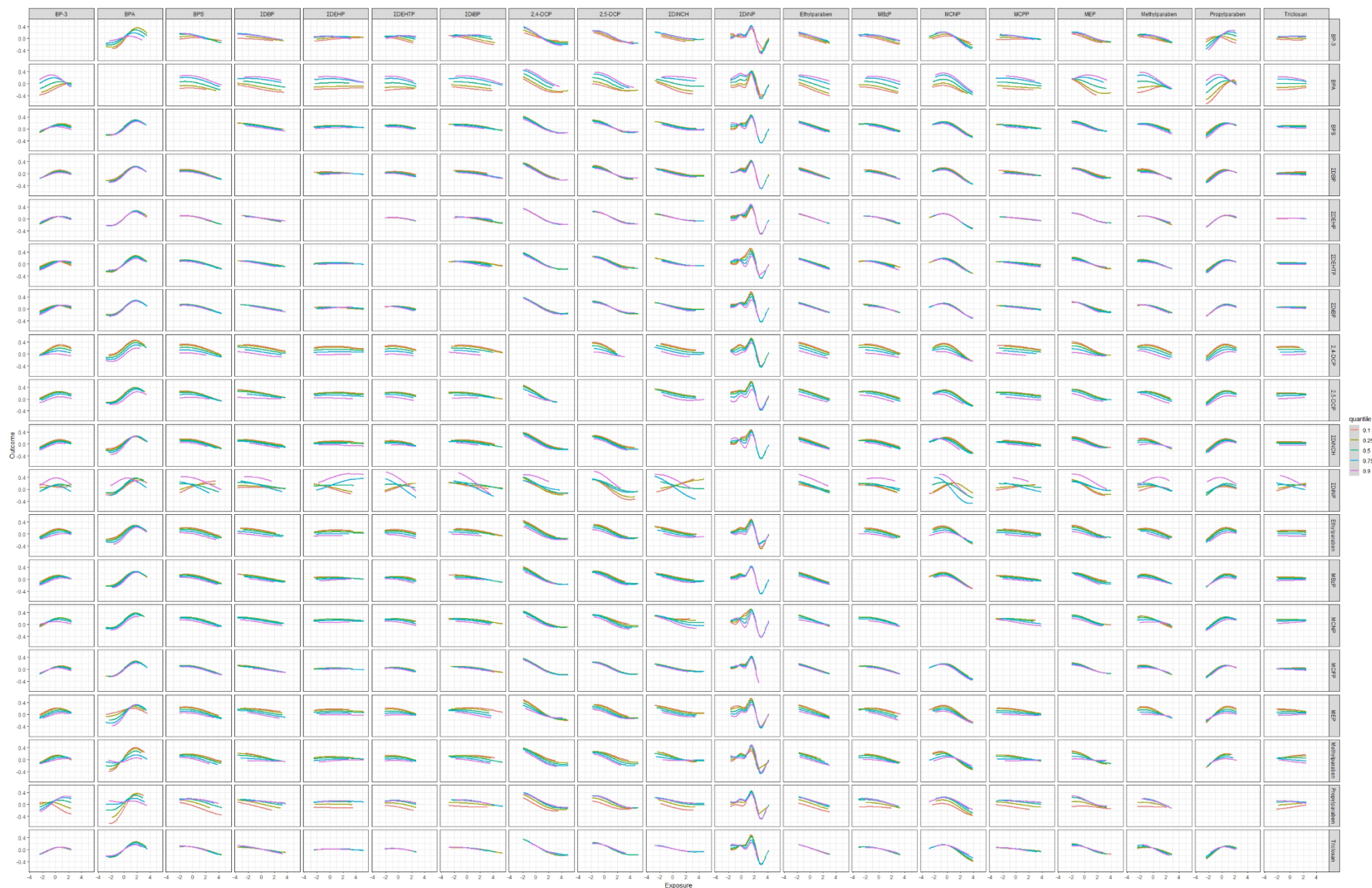


Figure S23. Bivariable EDC relationships with estradiol in all women. BKMR models were fit with 200,000 iterations and accounted for educational attainment, age, diet quality, pre-pregnancy body mass index, perceived stress in early pregnancy, lifetime smoking status, parity, race/ethnicity, gestational age at plasma hormone assessment. Bivariable plots interpreted as the dose-response relationship of each EDC metabolite with hormone while one other metabolite is fixed at various quantiles. BKMR, Bayesian kernel machine regression.

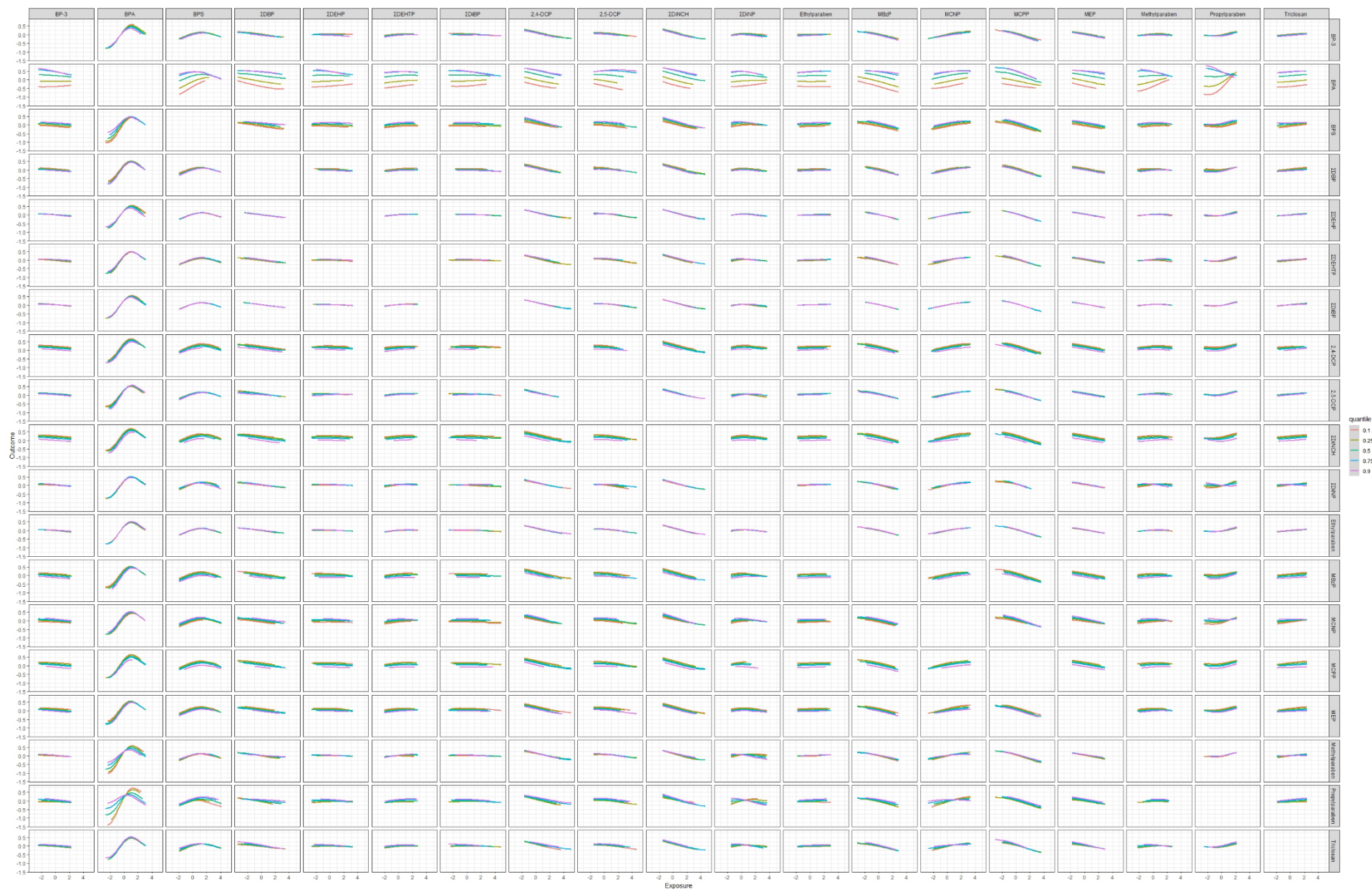


Figure S24. Bivariable EDC relationships with estradiol in women carrying females. BKMR models were fit with 200,000 iterations and accounted for educational attainment, age, diet quality, pre-pregnancy body mass index, perceived stress in early pregnancy, lifetime smoking status, parity, race/ethnicity, gestational age at plasma hormone assessment. Bivariable plots interpreted as the dose-response relationship of each EDC metabolite with hormone while one other metabolite is fixed at various quantiles. BKMR, Bayesian kernel machine regression.

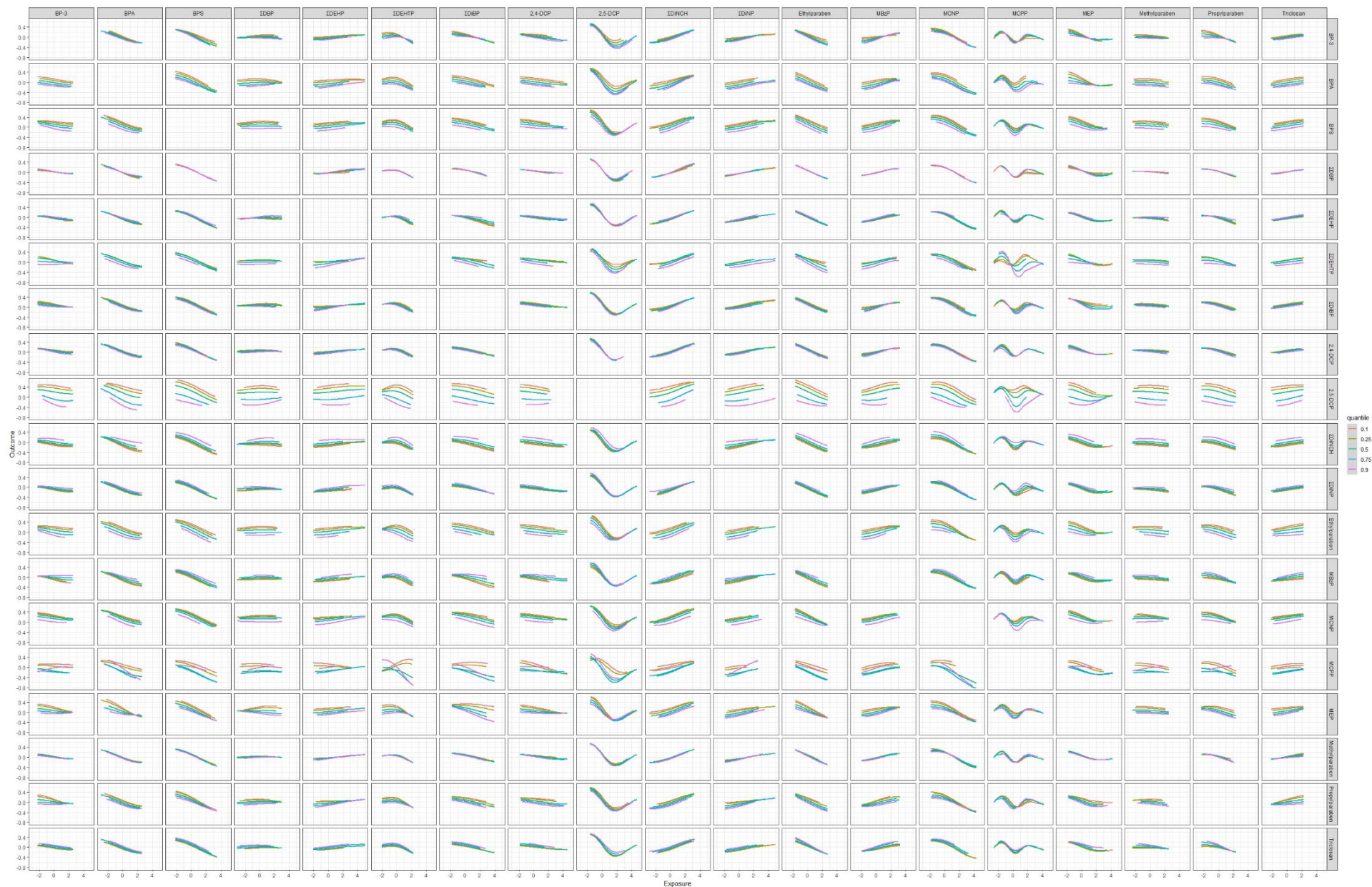


Figure S25. Bivariable EDC relationships with estradiol in women carrying males. BKMR models were fit with 200,000 iterations and accounted for educational attainment, age, diet quality, pre-pregnancy body mass index, perceived stress in early pregnancy, lifetime smoking status, parity, race/ethnicity, gestational age at plasma hormone assessment. Bivariable plots interpreted as the dose-response relationship of each EDC metabolite with hormone while one other metabolite is fixed at various quantiles. BKMR, Bayesian kernel machine regression.

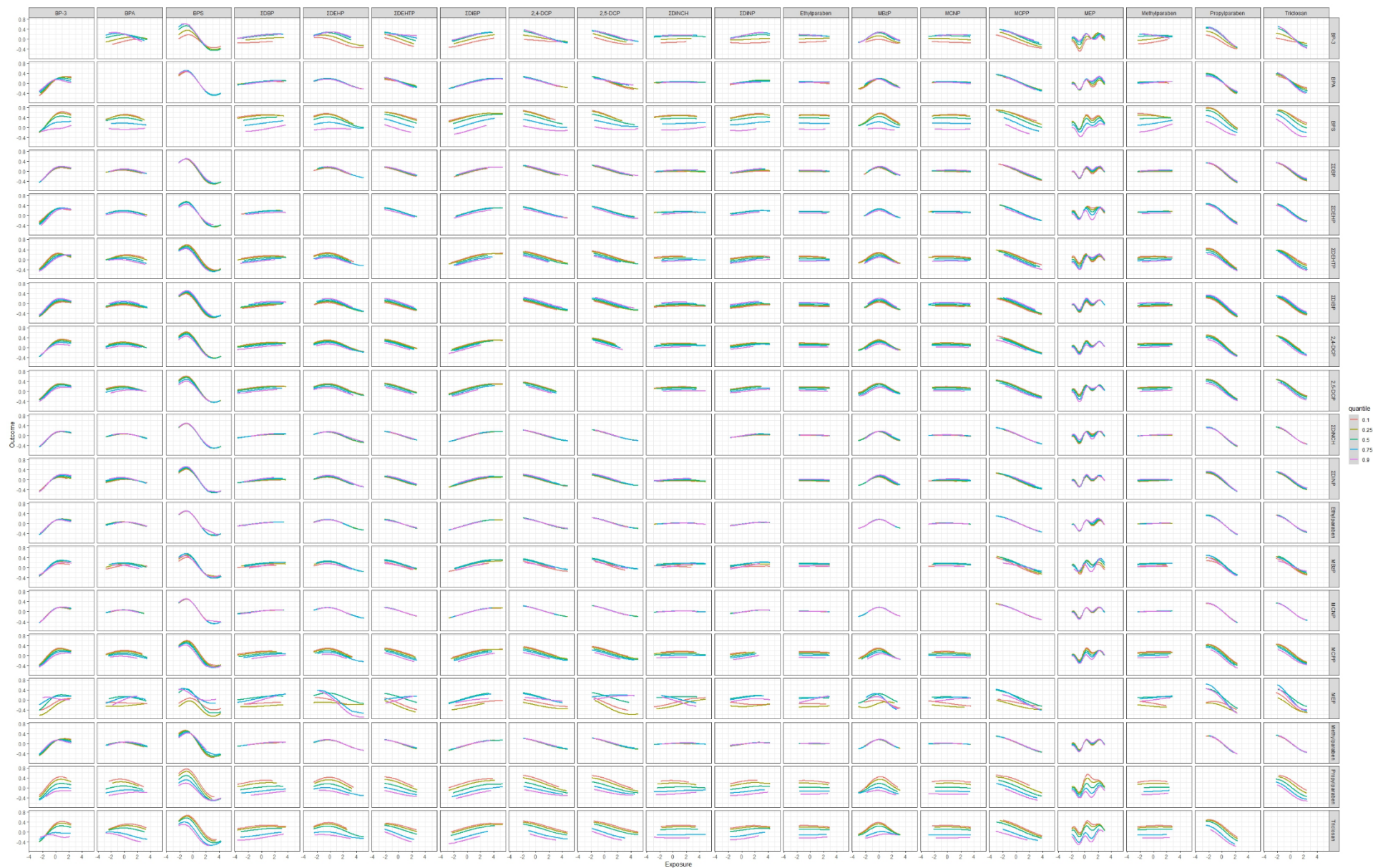


Figure S26. Bivariable EDC relationships with testosterone in all women. BKMR models were fit with 200,000 iterations and accounted for educational attainment, age, diet quality, pre-pregnancy body mass index, perceived stress in early pregnancy, lifetime smoking status, parity, race/ethnicity, gestational age at plasma hormone assessment. Bivariable plots interpreted as the dose-response relationship of each EDC metabolite with hormone while one other metabolite is fixed at various quantiles. BKMR, Bayesian kernel machine regression.

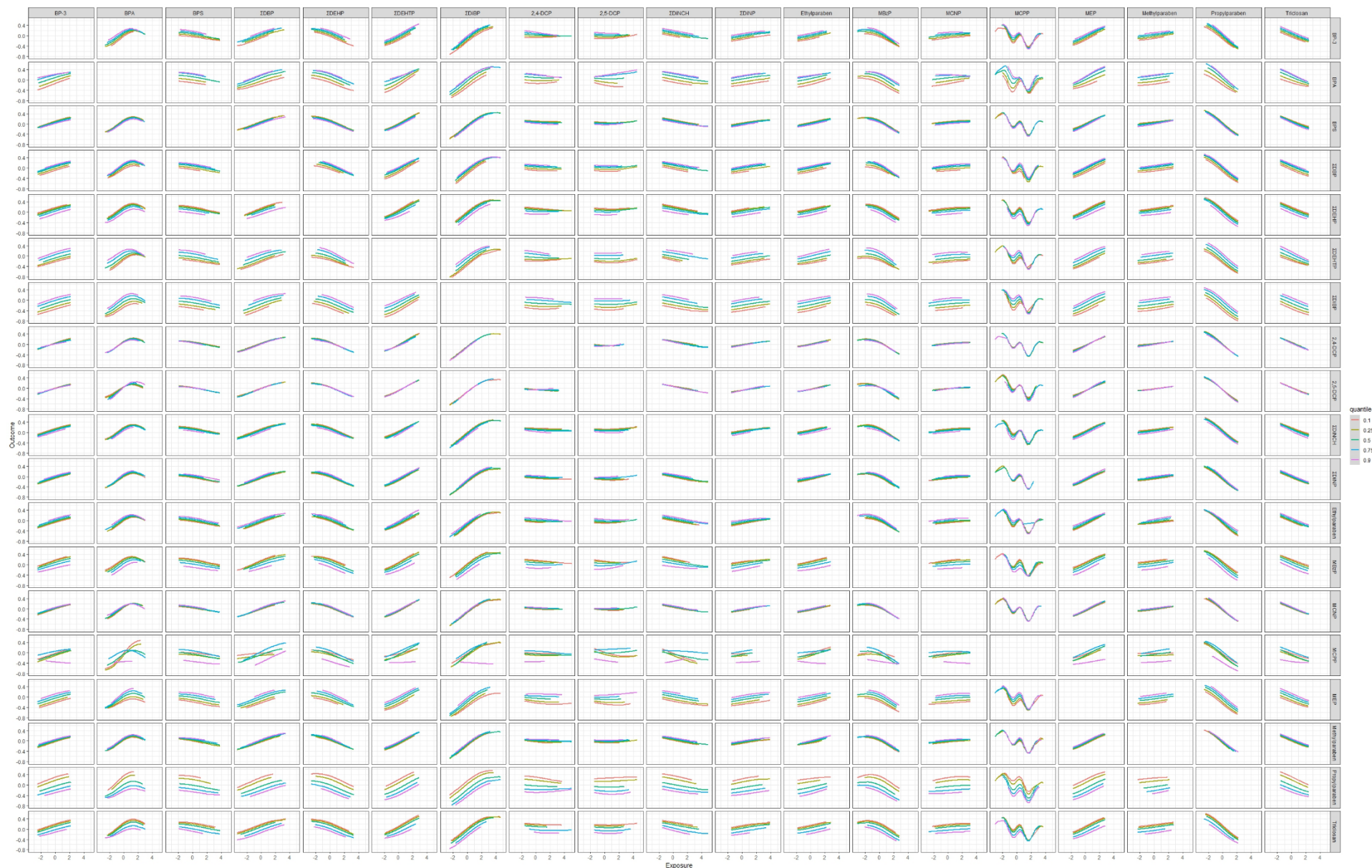


Figure S27. Bivariable EDC relationships with testosterone in women carrying females. BKMR models were fit with 200,000 iterations and accounted for educational attainment, age, diet quality, pre-pregnancy body mass index, perceived stress in early pregnancy, lifetime smoking status, parity, race/ethnicity, gestational age at plasma hormone assessment. Bivariable plots interpreted as the dose-response relationship of each EDC metabolite with hormone while one other metabolite is fixed at various quantiles. BKMR, Bayesian kernel machine regression.

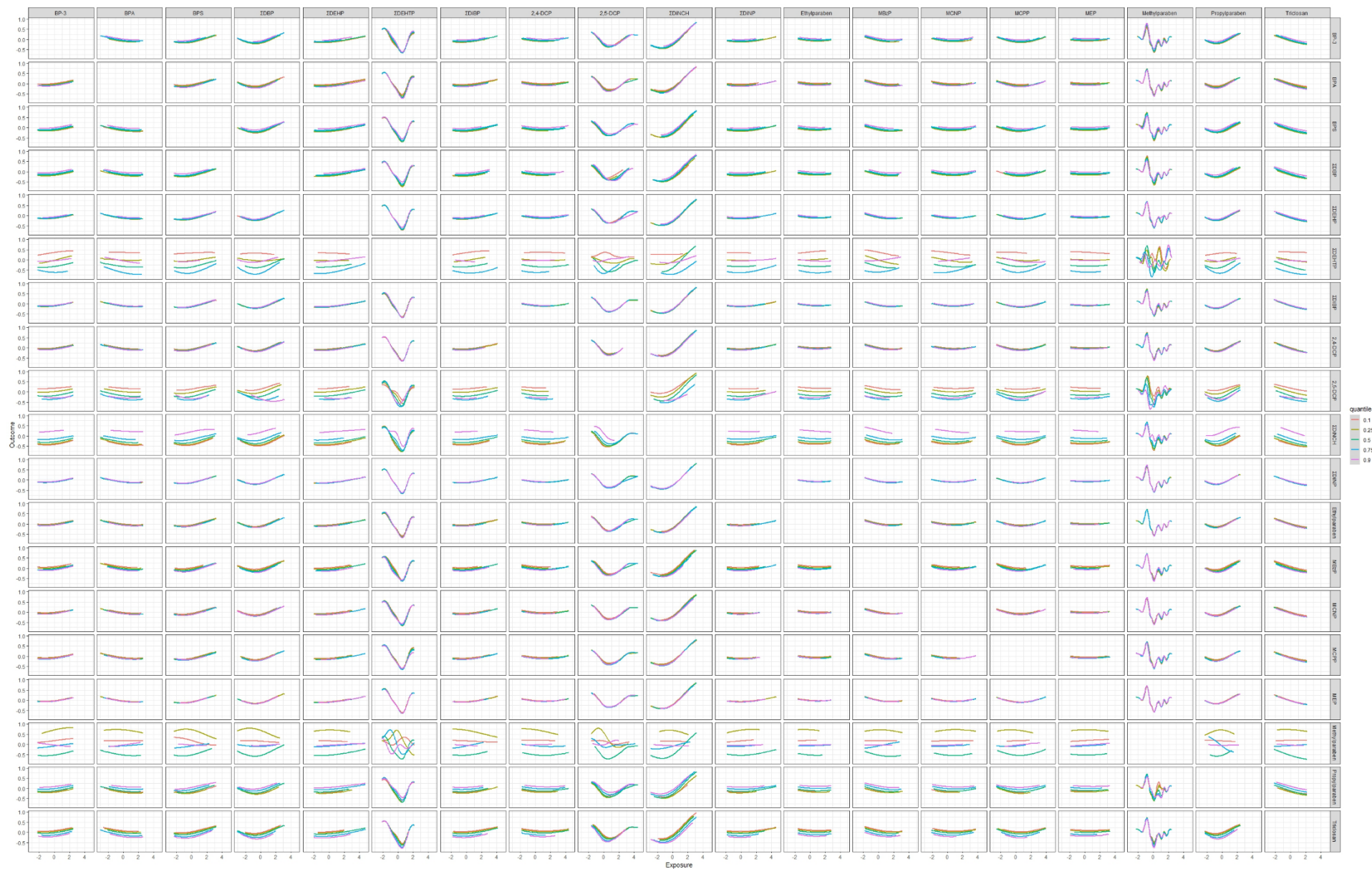


Figure S28. Bivariable EDC relationships with testosterone in women carrying males. BKMR models were fit with 200,000 iterations and accounted for educational attainment, age, diet quality, pre-pregnancy body mass index, perceived stress in early pregnancy, lifetime smoking status, parity, race/ethnicity, gestational age at plasma hormone assessment. Bivariable plots interpreted as the dose-response relationship of each EDC metabolite with hormone while one other metabolite is fixed at various quantiles. BKMR, Bayesian kernel machine regression.

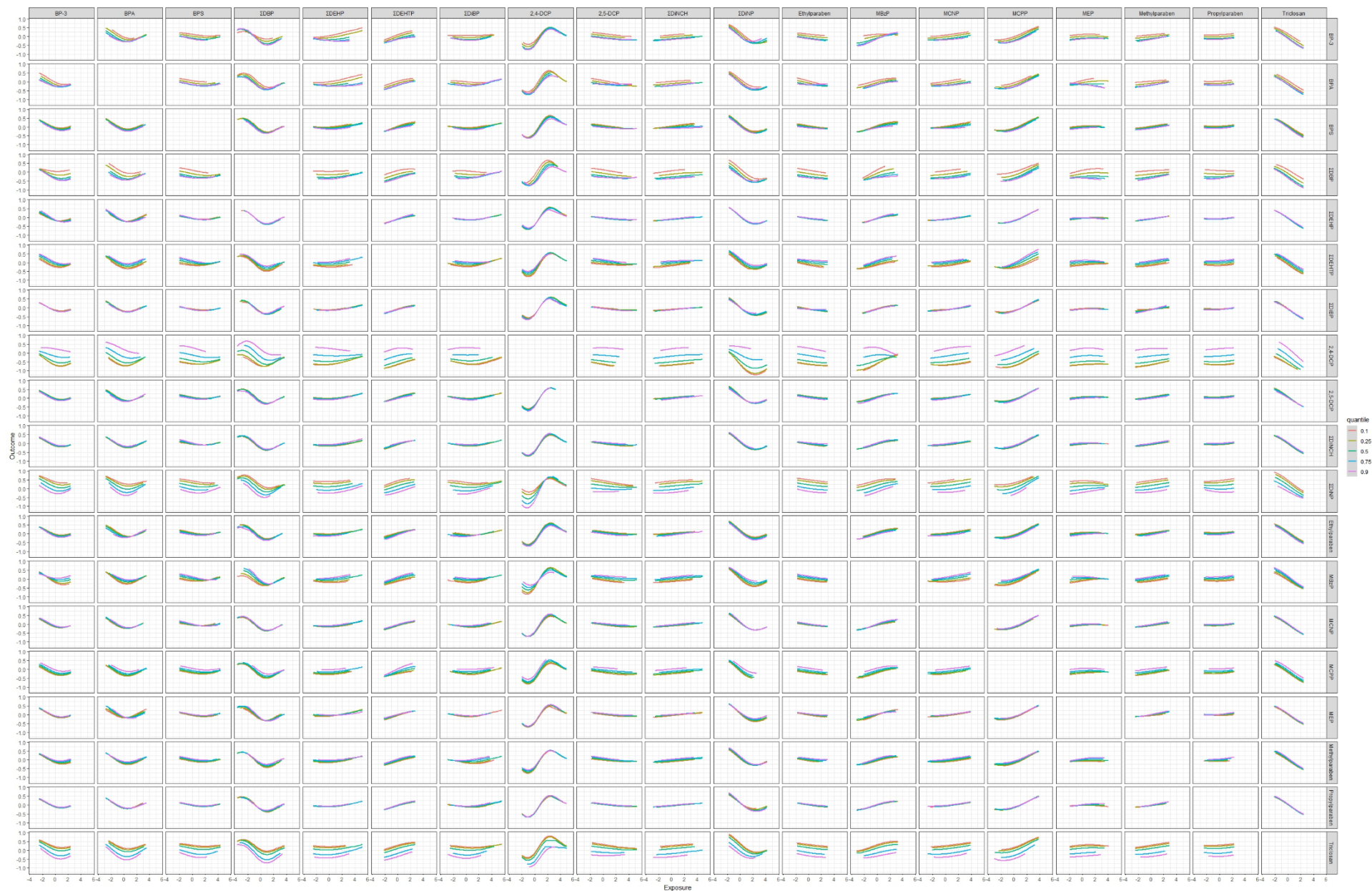


Figure S29. Bivariable EDC relationships with FT4 in all women. BKMR models were fit with 200,000 iterations and accounted for educational attainment, age, diet quality, pre-pregnancy body mass index, perceived stress in early pregnancy, lifetime smoking status, parity, race/ethnicity, gestational age at plasma hormone assessment. Bivariable plots interpreted as the dose-response relationship of each EDC metabolite with hormone while one other metabolite is fixed at various quantiles. BKMR, Bayesian kernel machine regression.

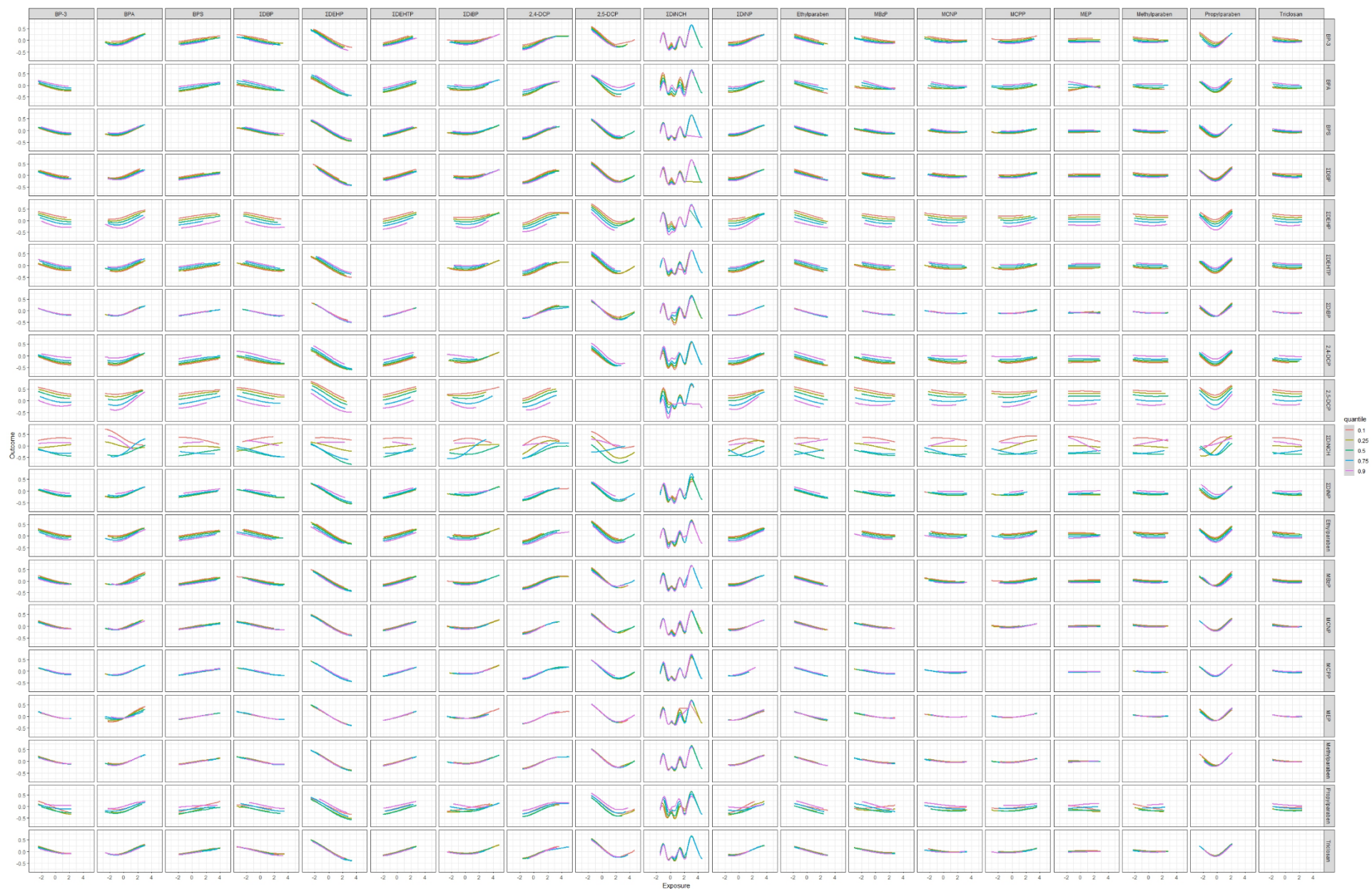


Figure S30. Bivariable EDC relationships with FT4 in women carrying females. BKMR models were fit with 200,000 iterations and accounted for educational attainment, age, diet quality, pre-pregnancy body mass index, perceived stress in early pregnancy, lifetime smoking status, parity, race/ethnicity, gestational age at plasma hormone assessment. Bivariable plots interpreted as the dose-response relationship of each EDC metabolite with hormone while one other metabolite is fixed at various quantiles. BKMR, Bayesian kernel machine regression.

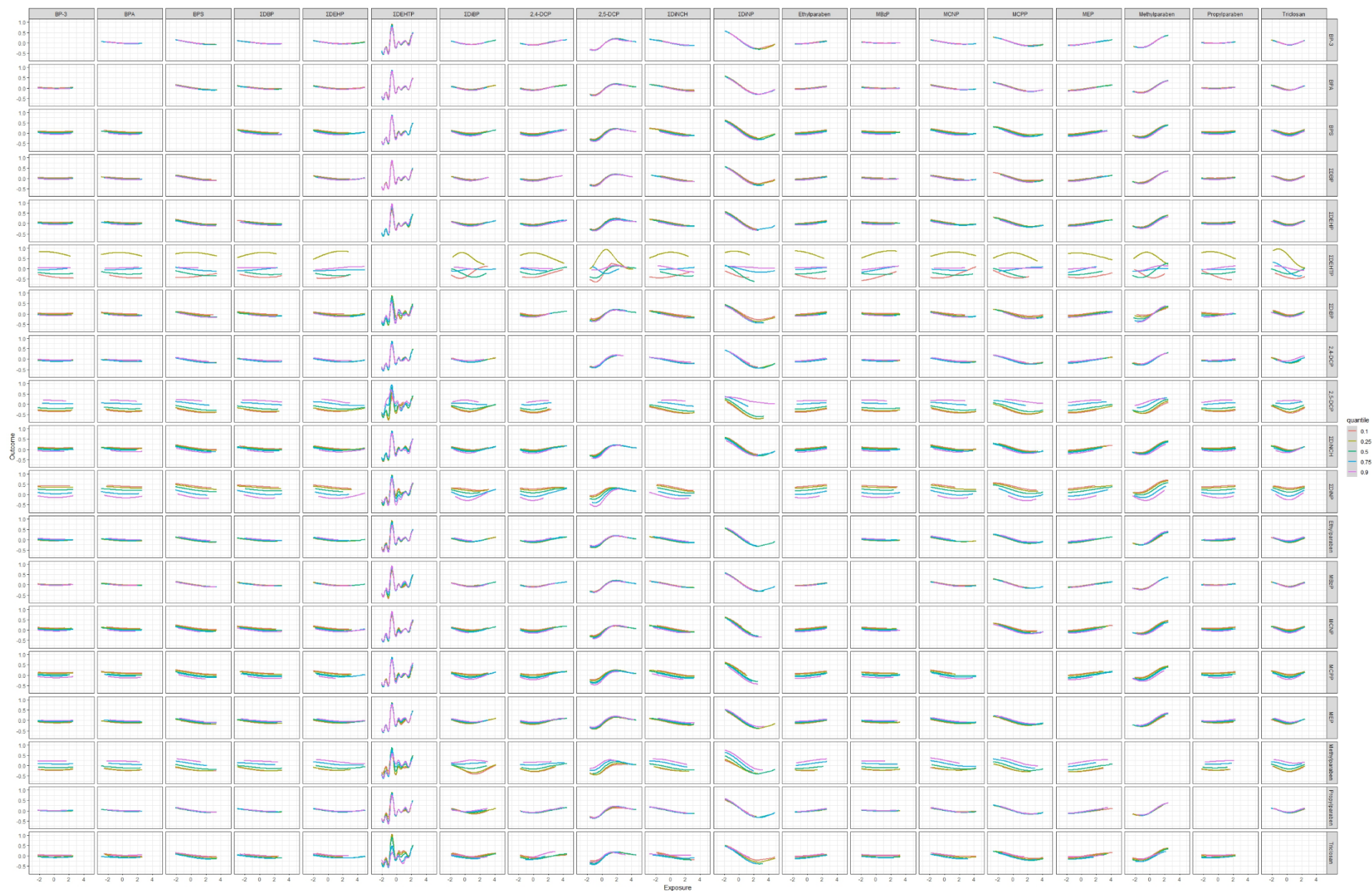


Figure S31. Bivariable EDC relationships with FT4 in women carrying males. BKMR models were fit with 200,000 iterations and accounted for educational attainment, age, diet quality, pre-pregnancy body mass index, perceived stress in early pregnancy, lifetime smoking status, parity, race/ethnicity, gestational age at plasma hormone assessment. Bivariable plots interpreted as the dose-response relationship of each EDC metabolite with hormone while one other metabolite is fixed at various quantiles. BKMR, Bayesian kernel machine regression.

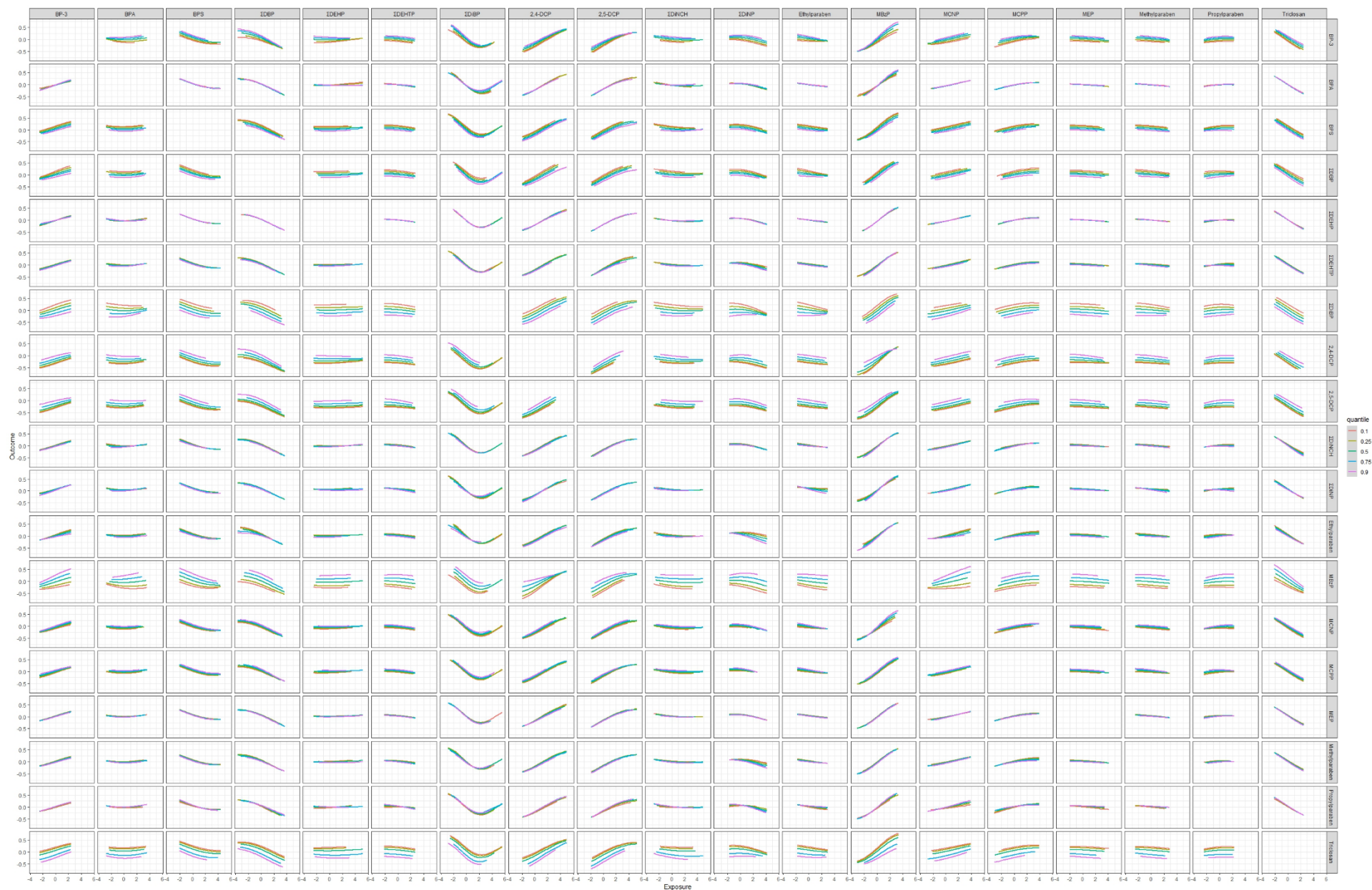


Figure S32. Bivariable EDC relationships with TT4 in all women. BKMR models were fit with 200,000 iterations and accounted for educational attainment, age, diet quality, pre-pregnancy body mass index, perceived stress in early pregnancy, lifetime smoking status, parity, race/ethnicity, gestational age at plasma hormone assessment. Bivariable plots interpreted as the dose-response relationship of each EDC metabolite with hormone while one other metabolite is fixed at various quantiles. BKMR, Bayesian kernel machine regression.

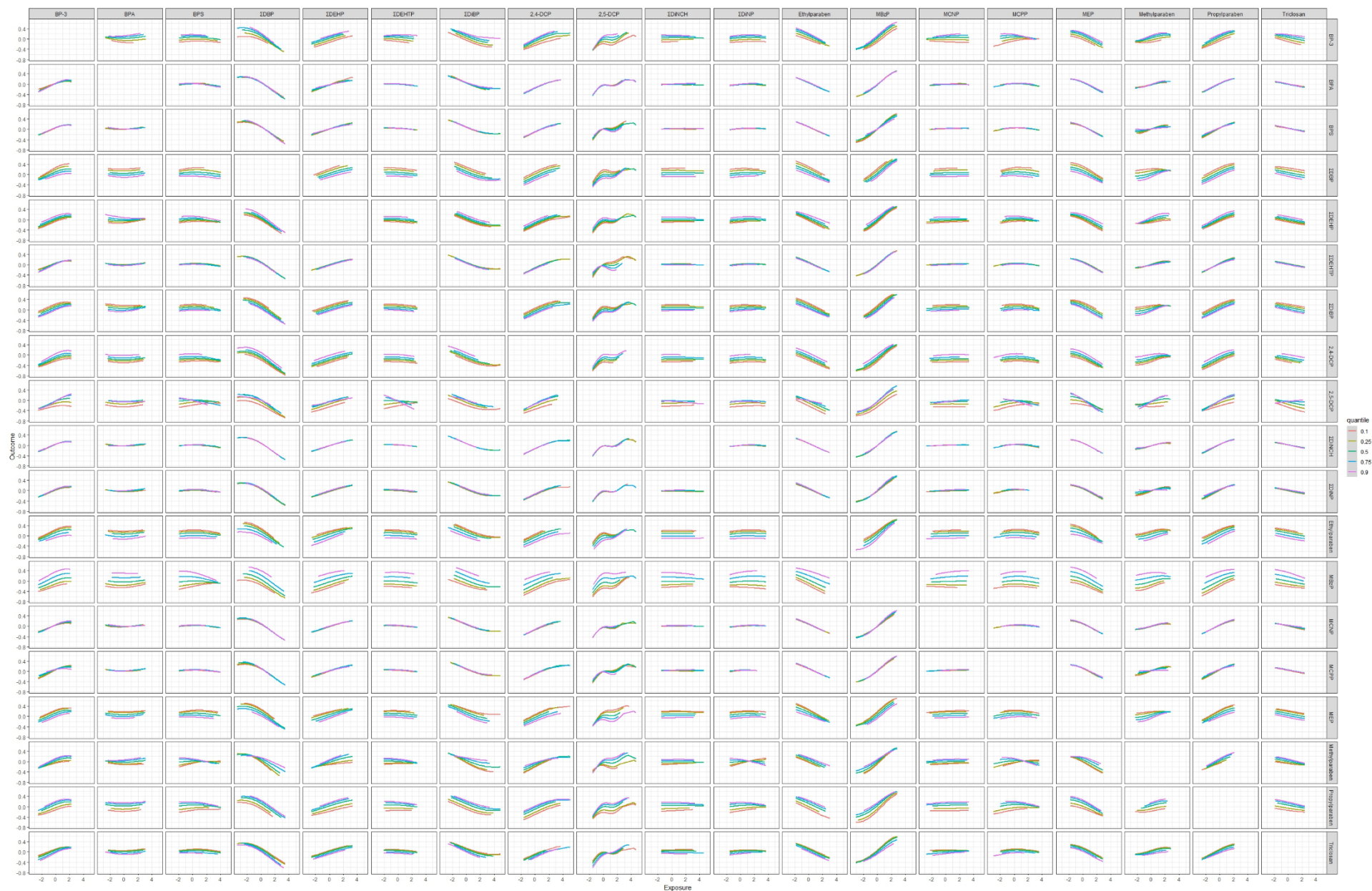


Figure S33. Bivariable EDC relationships with TT4 in women carrying females. BKMR models were fit with 200,000 iterations and accounted for educational attainment, age, diet quality, pre-pregnancy body mass index, perceived stress in early pregnancy, lifetime smoking status, parity, race/ethnicity, gestational age at plasma hormone assessment. Bivariable plots interpreted as the dose-response relationship of each EDC metabolite with hormone while one other metabolite is fixed at various quantiles. BKMR, Bayesian kernel machine regression.

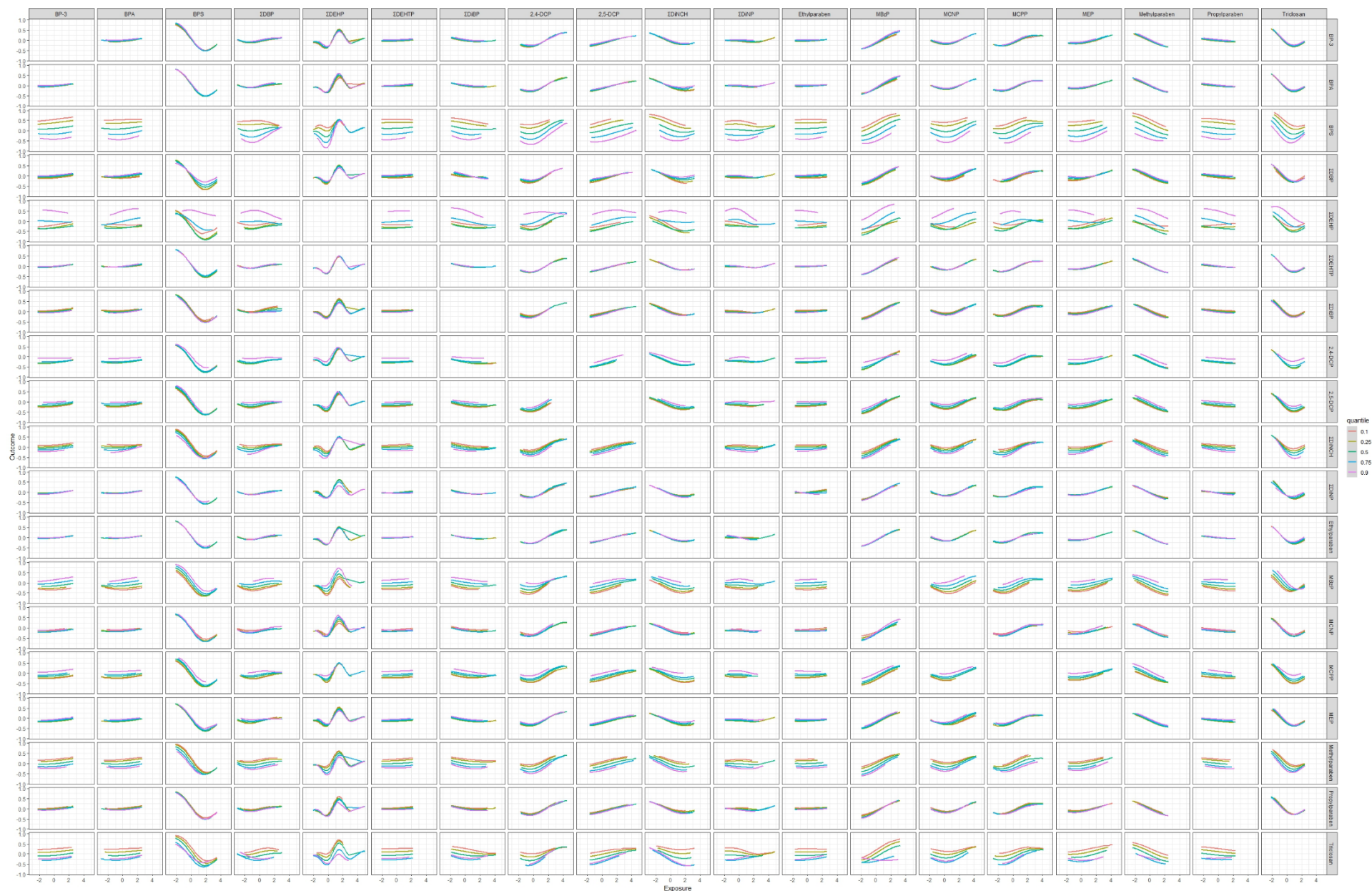


Figure S34. Bivariable EDC relationships with TT4 in women carrying males. BKMR models were fit with 200,000 iterations and accounted for educational attainment, age, diet quality, pre-pregnancy body mass index, perceived stress in early pregnancy, lifetime smoking status, parity, race/ethnicity, gestational age at plasma hormone assessment. Bivariable plots interpreted as the dose-response relationship of each EDC metabolite with hormone while one other metabolite is fixed at various quantiles. BKMR, Bayesian kernel machine regression.

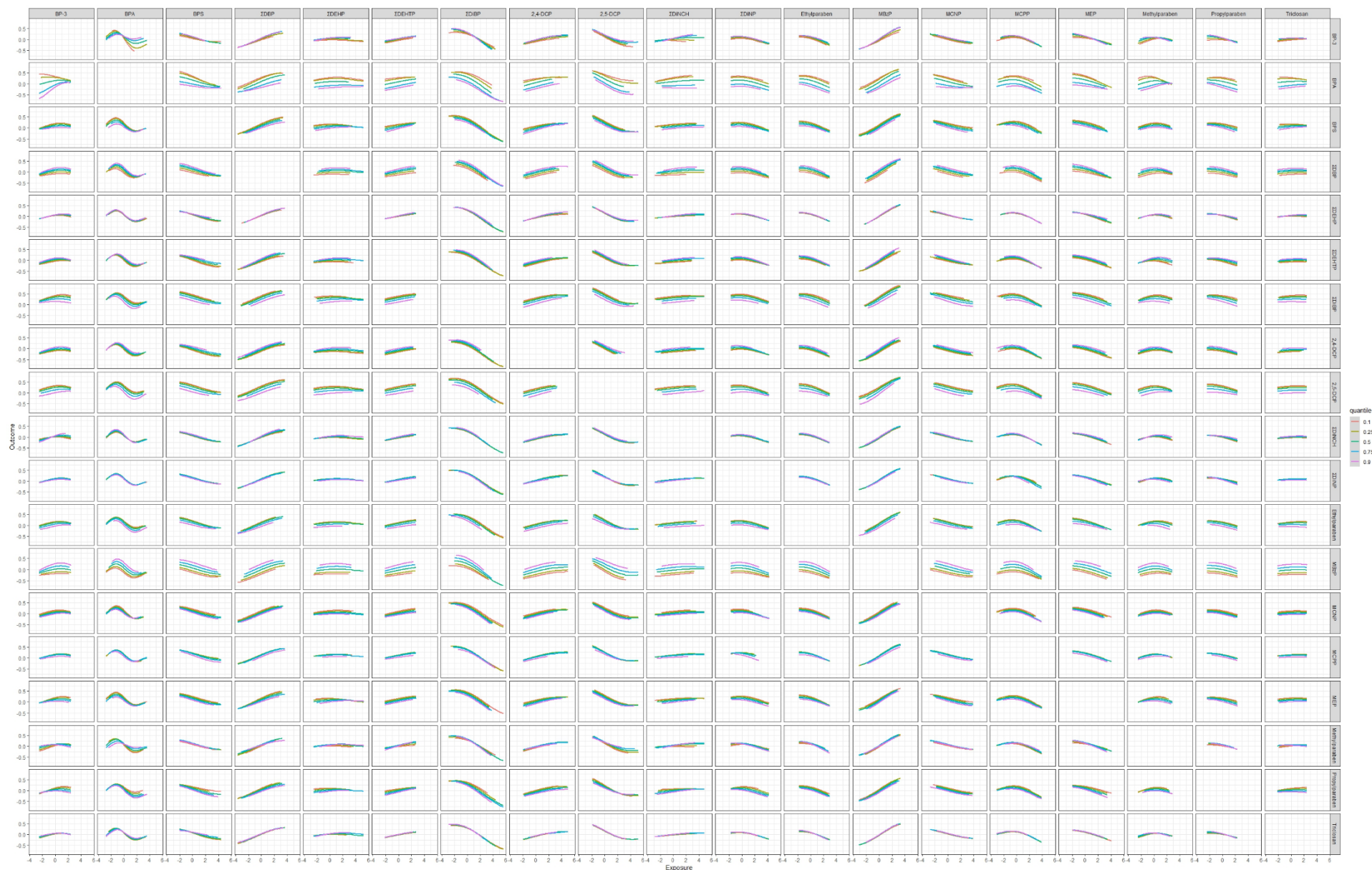


Figure S35. Bivariable EDC relationships with TSH in all women. BKMR models were fit with 200,000 iterations and accounted for educational attainment, age, diet quality, pre-pregnancy body mass index, perceived stress in early pregnancy, lifetime smoking status, parity, race/ethnicity, gestational age at plasma hormone assessment. Bivariable plots interpreted as the dose-response relationship of each EDC metabolite with hormone while one other metabolite is fixed at various quantiles. BKMR, Bayesian kernel machine regression.

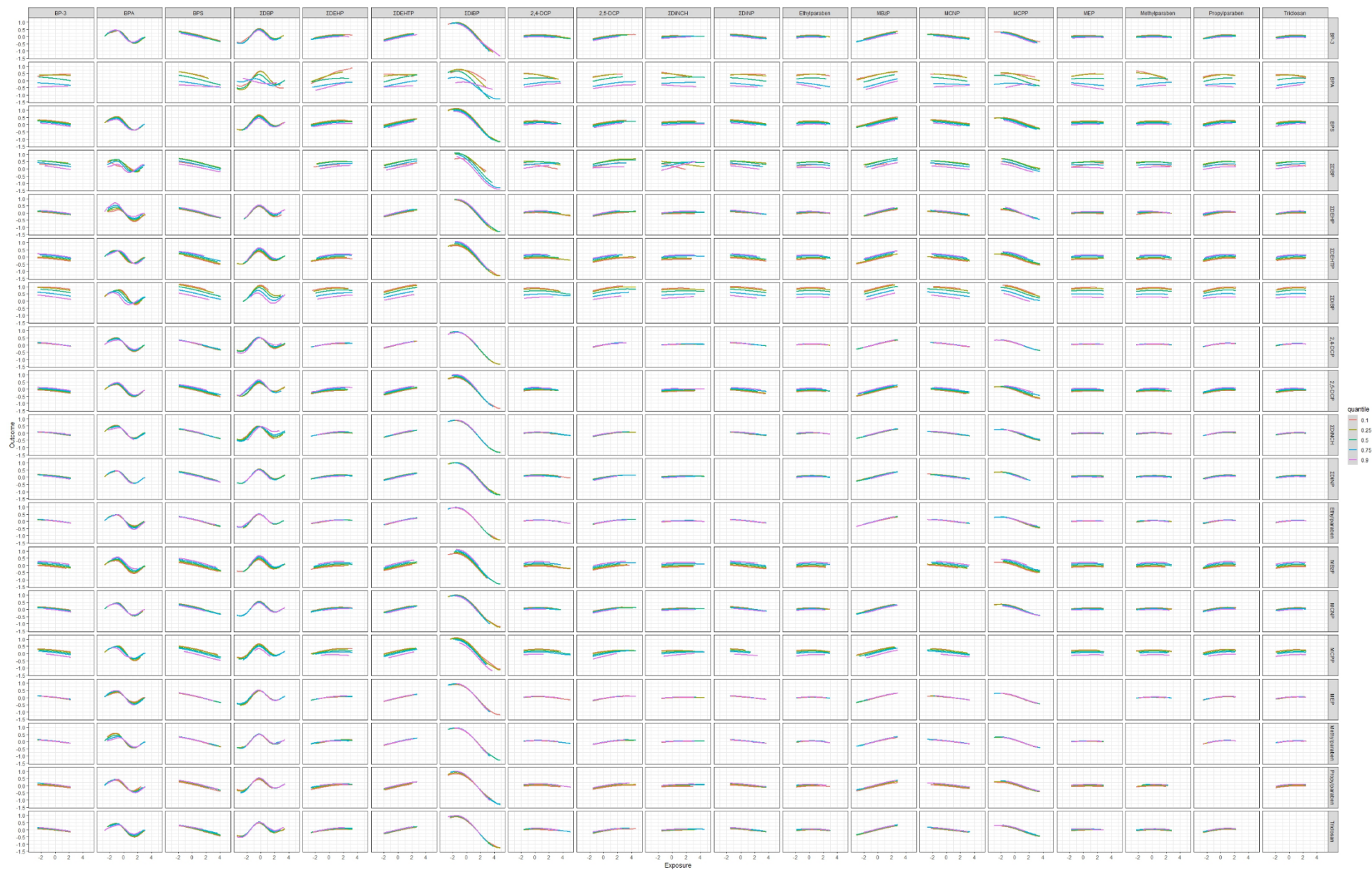


Figure S36. Bivariable EDC relationships with TSH in women carrying females. BKMR models were fit with 200,000 iterations and accounted for educational attainment, age, diet quality, pre-pregnancy body mass index, perceived stress in early pregnancy, lifetime smoking status, parity, race/ethnicity, gestational age at plasma hormone assessment. Bivariable plots interpreted as the dose-response relationship of each EDC metabolite with hormone while one other metabolite is fixed at various quantiles. BKMR, Bayesian kernel machine regression.

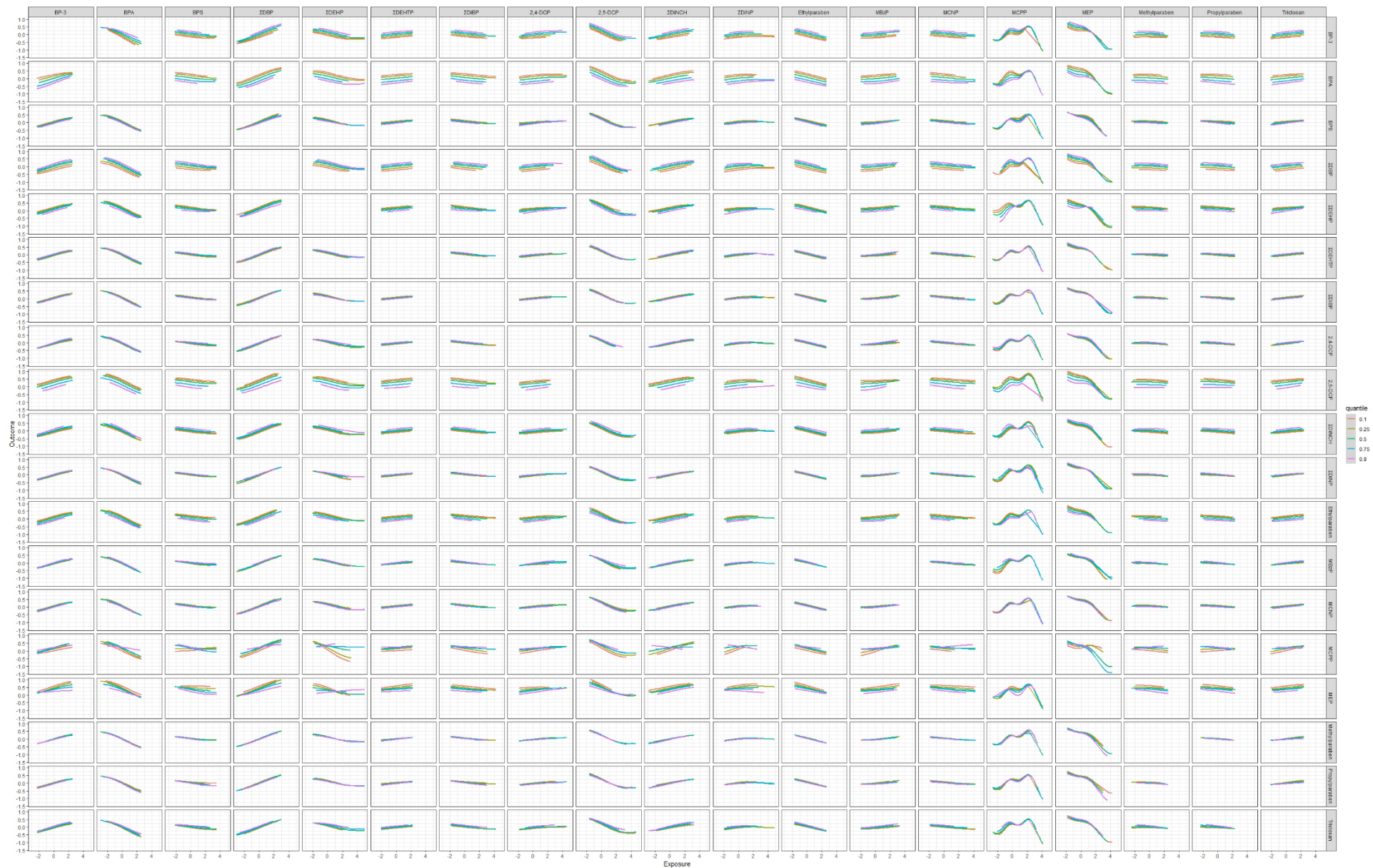


Figure S37. Bivariable EDC relationships with TSH in women carrying males. BKMR models were fit with 200,000 iterations and accounted for educational attainment, age, diet quality, pre-pregnancy body mass index, perceived stress in early pregnancy, lifetime smoking status, parity, race/ethnicity, gestational age at plasma hormone assessment. Bivariable plots interpreted as the dose-response relationship of each EDC metabolite with hormone while one other metabolite is fixed at various quantiles. BKMR, Bayesian kernel machine regression.

Figure S38.

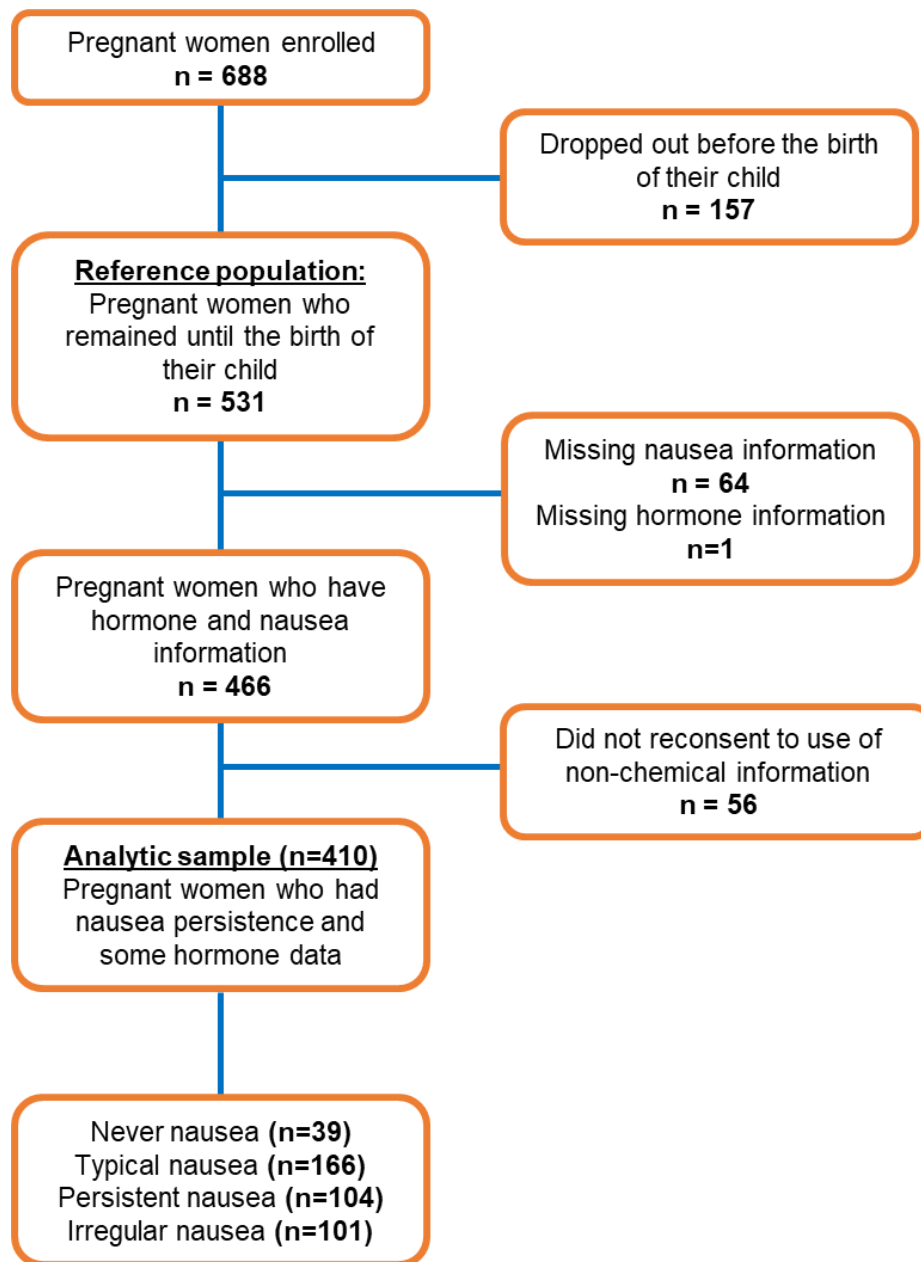


Figure S38. Flowchart of analytic sample derivation from reference population, including analytic sample size (n=410) and sample size by nausea type.

Figure S39.

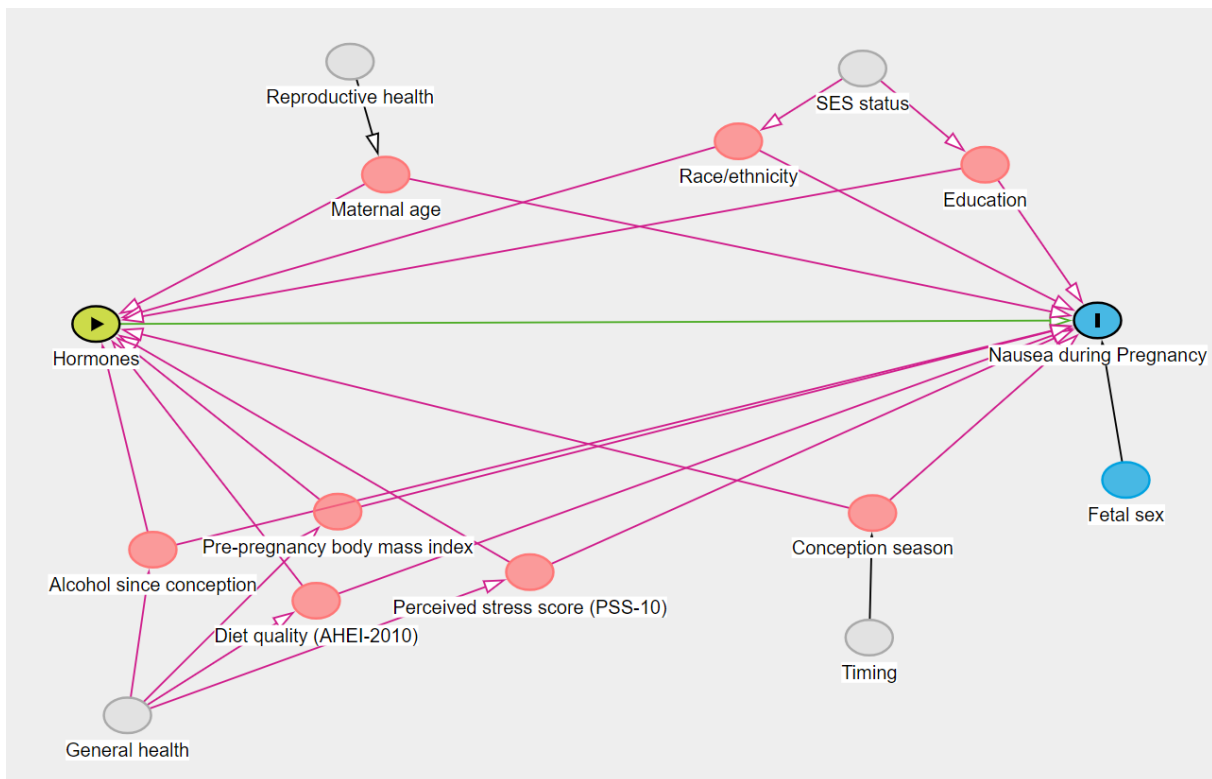


Figure S39. Directed acyclic graph of exposure-outcome relationship. Green circle represents the single hormones and hormone mixtures. The blue box represents our outcomes of interest (nausea during pregnancy) and any potential covariates that were associated with hormones. The red boxes represent potential confounders that were accounted for in all statistical models. The grey boxes represent potential latent variables. AHEI-2010, Alternative Healthy Eating Index 2010; PSS-10, perceived stress score 10.

Figure S40.

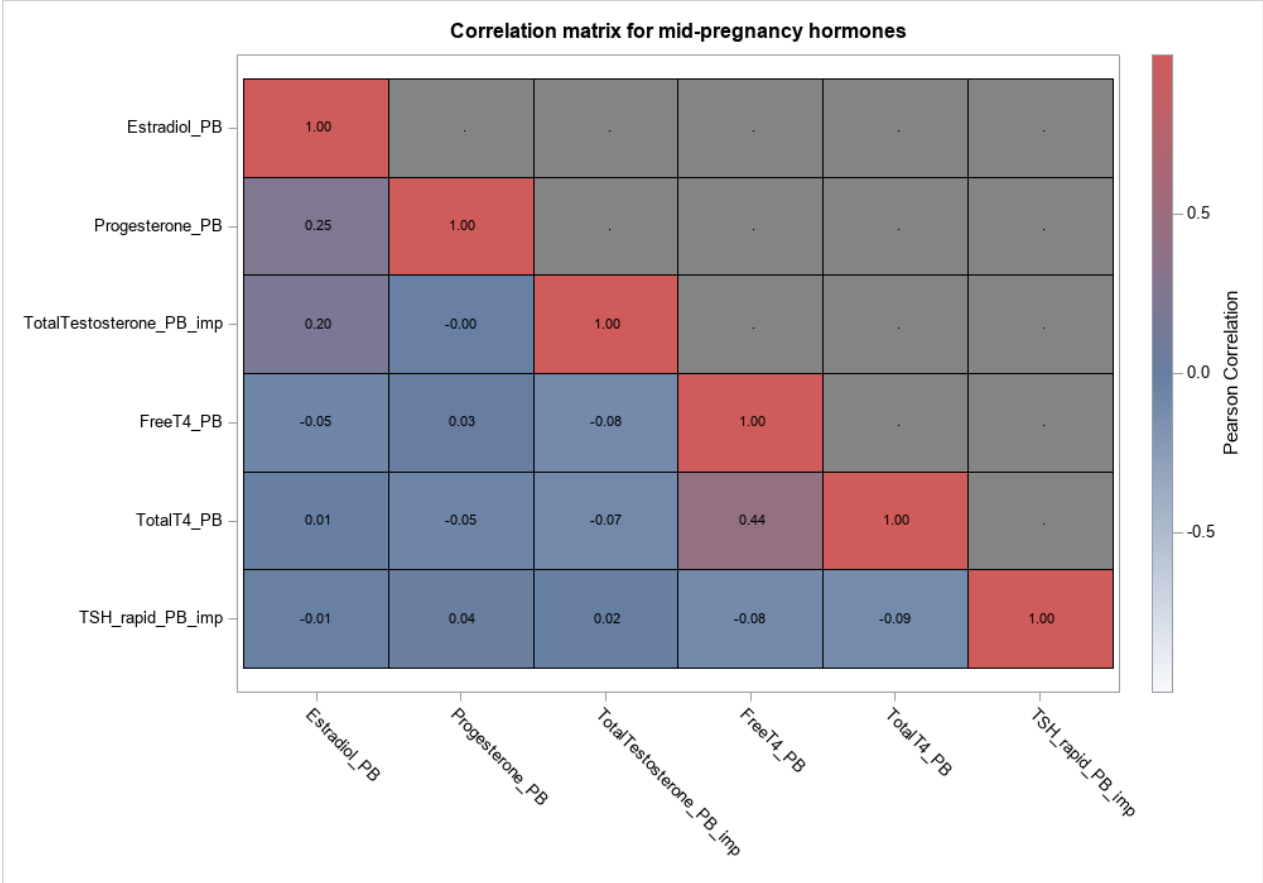


Figure S40. Correlation heatmap of all gestational hormones (n=410). Pearson correlation coefficients on heat map between all hormones. Blue boxes represent negative correlations, while red boxes indicate positive correlations. Darker boxes represent stronger correlations (r closer to 1 or -1), while lighter boxes represent weaker correlations (r closer to 0).