Environ Health Perspect
DOI: 10.1289/EHP1015

Supplemental Material

In Utero Exposure to Select Phenols and Phthalates and Respiratory Health in Five Year-Old Boys: A Prospective Study

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Figure S1. Occurrence of doctor-diagnosed asthma (A), wheezing (B) and bronchiolitis/bronchitis (C), Kaplan-Meier estimates.

Table S1. Phthalates and associated urinary metabolites in the EDEN cohort

Parent compound	Abbreviation	Urinary metabolites	Abbreviation
Diethyl phthalate	DEP	Mono-ethyl phthalate	MEP
Di-n-butyl phthalate	DnBP	Mono-n-butyl phthalate	MnBP
Di-isobutyl phthalate	DiBP	Mono-isobutyl phthalate	MiBP
Di-*n*-octylphthalate	DNOP	Mono-(3-carboxypropyl) phthalate	MCPP
Di-n-butyl phthalate	DnBP		
Other high molecular weight phthalates	/		
Butylbenzyl phthalate	BBzP	Mono-benzyl phthalate	MBzP
Di-isodecyl phthalate	DIDP	Mono-(carboxynonyl) phthalate	MCNP
Di-isononyl phthalate	DINP	Mono(carboxyoctyl) phthalate	MCOP
Di-2-ethylhexyl phthalate	DEHP	Mono-(2-ethyl-5-hydroxyhexyl) phthalate	MEHHP
		Mono-(2-ethyl-5-oxohexyl) phthalate	MEOHP
		Mono-(2-ethyl-5-carboxypentyl) phthalate	MECPP
		Mono-2-ethylhexyl phthalate	MEHP

Table S2. Spearman correlation between ln-transformed standardized [a] phenol concentrations

	2,4-DCP	2,5-DCP	∑2-DCP	BPA	BP3	TCS	MP	EP	PP	BP	∑PB
2,4-DCP	1.00										
2,5-DCP	0.82	1.00									
∑2-DCP	0.86	1.00	1.00								
BPA	0.01	0.05	0.05	1.00							
BP3	0.06	0.04	0.04	0.03	1.00						
TCS	0.13	-0.11	-0.08	-0.05	0.01	1.00					
MP	-0.02	-0.09	-0.08	0.07	0.20	0.15	1.00				
EP	0.08	-0.04	-0.02	-0.03	0.15	0.16	0.55	1.00			
PP	0.00	-0.07	-0.06	0.00	0.12	0.22	0.81	0.49	1.00		
BP	0.03	-0.11	-0.09	0.00	0.16	0.23	0.55	0.68	0.53	1.00	
∑PB	-0.01	-0.09	-0.08	0.05	0.19	0.17	0.99	0.59	0.84	0.58	1.00

2,4-DCP = 2,4-Dichlorophenol; 2,5-DCP = 2,5-Dichlorophenol; ∑2-DCP = molar sum of 2-Dichlorophenols (2,4-DCP, 2,5-DCP); BPA = Bisphenol A; BP3 = Benzophenone-3; TCS = Triclosan; MP = Methyl-paraben; EP = Ethyl-paraben; PP = Propyl-paraben; BP = Butyl-paraben; ∑PB = molar sum of parabens (MP, EP, PP, BP).

[a] Standardized for urine sampling conditions (creatinine level, day and hour of sampling, gestational age, storage duration at room temperature and year of analysis), as detailed in *Mortamais et al.* (2012).

Table S3. Spearman correlation between ln-transformed standardized [a] phthalate metabolites concentrations

	∑LMW	MEP	MnBP	MiBP	∑HMW	MCPP	MBzP	MCNP	MCOP	MEHHP	MEOHP	MECPP	MEHP	∑DEHP
∑LMW	1.00													
MEP	0.78	1.00												
MnBP	0.59	0.08	1.00											
MiBP	0.33	0.03	0.39	1.00										
∑HMW	0.16	0.00	0.33	0.37	1.00									
MCPP	0.41	0.04	0.64	0.24	0.31	1.00								
MBzP	0.27	0.12	0.37	0.43	0.57	0.23	1.00							
MCNP	0.05	0.03	0.06	0.10	0.28	0.29	0.13	1.00						
MCOP	0.06	0.02	0.06	0.12	0.44	0.23	0.25	0.44	1.00					
MEHHP	0.11	0.01	0.25	0.31	0.93	0.21	0.38	0.21	0.35	1.00				
MEOHP	0.11	0.00	0.26	0.35	0.95	0.23	0.41	0.22	0.37	0.98	1.00			
MECPP	0.03	-0.04	0.18	0.26	0.93	0.18	0.32	0.23	0.37	0.94	0.95	1.00		
MEHP	0.10	-0.01	0.22	0.36	0.83	0.19	0.38	0.16	0.33	0.82	0.84	0.80	1.00	
∑DEHP	0.08	-0.02	0.23	0.31	0.95	0.20	0.37	0.22	0.36	0.98	0.99	0.98	0.86	1.00

∑LMW = molar sum of Low Molecular Weight phthalates (MEP, MnBP, MiBP); MEP = Monoethyl phthalate; MnBP = Mono-n-butyl phthalate; MiBP = Mono-isobutyl phthalate; ∑HMW = molar sum of High Molecular Weight phthalates (MCPP, MBzP, MCNP, MCOP, MEHHP, MEOHP, MECPP, MEHP); MCPP = Mono (3-carboxypropyl) phthalate; MBzP = Monobenzyl phthalate; MCNP = Mono-(carboxynonyl) phthalate, MCOP = Monocarboxy-isooctyl phthalate; MEHHP = Mono(2-ethyl-5-hydroxyhexyl) phthalate; MEOHP = Mono(2-ethyl-5-oxohexyl) phthalate; MECPP = Mono(2-ethyl-5-carboxypentyl) phthalate; MEHP = Mono(2-ethylhexyl) phthalate; ∑DEHP = molar sum of di(2-ethylhexyl) phthalate metabolites (MEHHP, MEOHP, MECPP, MEHP).

[a] Standardized for urine sampling conditions (creatinine level, day and hour of sampling, gestational age, storage duration at room temperature and year of analysis), as detailed in *Mortamais et al.* (2012).

Table S4. Adjusted associations between pregnancy phenols raw (non-standardized) concentrations and respiratory outcomes (n=587) and FEV_1% (n=228) in boys. Models additionally adjusted for creatinine.

	Wheezing (until age 5y)[a]			Asthma diagnosis (until age 5y)[a]			Bronchiolitis/Bronchitis (until age 3y)[a]			FEV_1%[b]		
	N = 587			N = 587			N = 587			N = 228		
Phenol[c]	HR (95% CI)	p_{het}[e]	*p*-value	HR (95% CI)	p_{het}[e]	*p*-value	HR (95% CI)	p_{het}[e]	*p*-value	beta (95% CI)	p_{het}[e]	*p*-value
2,4-Dichlorophenol												
Continuous[d]	1.06 (0.95, 1.18)		0.27	1.02 (0.87, 1.20)		0.79	0.98 (0.89, 1.08)		0.69	0.31 (-0.93, 1.55)		0.62
T1	1.00	0.31	*0.23*	1.00	0.85	*0.64*	1.00	0.93	*0.71*	0.00	0.91	*0.85*
T2	0.89 (0.64, 1.22)			0.94 (0.58, 1.52)			1.00 (0.78, 1.29)			0.54 (-3.11, 4.18)		
T3	1.13 (0.83, 1.55)			1.08 (0.67, 1.74)			0.96 (0.74, 1.24)			-0.20 (-3.93, 3.54)		
2,5-Dichlorophenol												
Continuous[d]	1.08 (1.00, 1.16)		0.04	1.04 (0.93, 1.16)		0.53	1.00 (0.94, 1.07)		0.97	0.18 (-0.67, 1.03)		0.68
T1	1.00	0.02	*0.39*	1.00	0.22	*0.50*	1.00	0.84	*0.67*	0.00	0.82	*0.85*
T2	1.57 (1.14, 2.16)			1.51 (0.94, 2.42)			1.06 (0.82, 1.37)			1.15 (-2.50, 4.80)		
T3	1.38 (1.00, 1.91)			1.37 (0.85, 2.23)			1.07 (0.84, 1.38)			0.87 (-2.82, 4.56)		
∑Dichlorophenols												
Continuous[d]	1.08 (1.00, 1.17)		0.05	1.04 (0.92, 1.17)		0.56	1.00 (0.94, 1.07)		1.00	0.21 (-0.69, 1.11)		0.65
T1	1.00	0.02	*0.41*	1.00	0.17	*0.53*	1.00	0.67	*0.51*	0.00	0.76	*0.85*
T2	1.59 (1.15, 2.19)			1.57 (0.97, 2.53)			1.09 (0.85, 1.41)			1.36 (-2.35, 5.06)		
T3	1.39 (1.00, 1.93)			1.39 (0.85, 2.27)			1.12 (0.87, 1.44)			0.99 (-2.72, 4.70)		
Bisphenol A												
Continuous[d]	0.98 (0.83, 1.15)		0.77	1.21 (0.96, 1.53)		0.11	1.13 (0.99, 1.30)		0.07	-0.55 (-2.34, 1.23)		0.54
T1	1.00	0.14	*0.71*	1.00	0.51	*0.43*	1.00	0.11	*0.13*	0.00	0.61	*0.46*
T2	1.33 (0.97, 1.82)			1.30 (0.79, 2.14)			1.27 (0.98, 1.63)			-1.52 (-5.13, 2.09)		
T3	1.05 (0.74, 1.49)			1.32 (0.79, 2.19)			1.29 (0.99, 1.70)			-1.87 (-5.84, 2.10)		
Benzophenone-3												
Continuous[d]	0.94 (0.87, 1.01)		0.10	0.96 (0.85, 1.07)		0.46	0.99 (0.93, 1.05)		0.82	-0.32 (-1.19, 0.54)		0.46
T1	1.00	0.14	*0.05*	1.00	0.15	*0.27*	1.00	0.73	*0.43*	0.00	0.80	*0.50*
T2	0.96 (0.71, 1.30)			0.67 (0.43, 1.07)			0.98 (0.77, 1.25)			-0.09 (-3.61, 3.42)		
T3	0.74 (0.54, 1.02)			0.68 (0.42, 1.09)			0.91 (0.70, 1.17)			-1.09 (-4.68, 2.50)		
Triclosan												
Continuous[d]	0.98 (0.94, 1.03)		0.50	0.99 (0.92, 1.07)		0.86	0.99 (0.96, 1.03)		0.79	0.18 (-0.38, 0.75)		0.52
T1	1.00	0.74	*0.85*	1.00	0.83	*0.81*	1.00	0.95	*0.82*	0.00	0.97	*0.86*
T2	0.89 (0.65, 1.21)			1.13 (0.72, 1.77)			0.97 (0.76, 1.24)			-0.25 (-3.72, 3.22)		
T3	0.93 (0.69, 1.25)			1.00 (0.63, 1.60)			0.96 (0.76, 1.23)			0.19 (-3.31, 3.69)		
Methyl-paraben												
Continuous[d]	0.93 (0.85, 1.00)		0.06	0.99 (0.88, 1.12)		0.91	0.94 (0.88, 1.00)		0.05	-0.38 (-1.22, 0.46)		0.37
T1	1.00	0.11	*0.21*	1.00	0.56	*0.70*	1.00	0.02	*0.01*	0.00	0.65	*0.44*
T2	0.75 (0.55, 1.02)			1.23 (0.78, 1.95)			0.82 (0.65, 1.05)			0.65 (-2.85, 4.14)		
T3	0.76 (0.56, 1.04)			0.99 (0.60, 1.62)			0.68 (0.53, 0.89)			-1.03 (-4.70, 2.63)		
Ethyl-paraben												
Continuous[d]	1.01 (0.96, 1.08)		0.63	1.09 (1.00, 1.20)		0.06	0.99 (0.94, 1.03)		0.56	-0.55 (-1.19, 0.10)		0.10
T1	1.00	0.82	*0.55*	1.00	0.18	*0.31*	1.00	0.02	*0.05*	0.00	0.20	*0.08*
T2	0.98 (0.71, 1.34)			1.51 (0.93, 2.44)			1.22 (0.96, 1.56)			0.19 (-3.41, 3.80)		
T3	1.07 (0.78, 1.48)			1.51 (0.91, 2.51)			0.87 (0.67, 1.13)			-2.65 (-6.25, 0.96)		
Propyl-paraben												
Continuous[d]	0.96 (0.90, 1.02)		0.18	0.98 (0.89, 1.08)		0.71	0.96 (0.91, 1.01)		0.09	-0.12 (-0.82, 0.59)		0.74
T1	1.00	0.53	*0.31*	1.00	0.43	*0.37*	1.00	0.03	*0.05*	0.00	0.68	*0.38*
T2	0.91 (0.67, 1.23)			1.19 (0.75, 1.86)			0.77 (0.61, 0.99)			-0.37 (-3.94, 3.20)		
T3	0.84 (0.61, 1.14)			0.87 (0.53, 1.42)			0.73 (0.57, 0.94)			-1.56 (-5.18, 2.07)		
Butyl-paraben												
Continuous[d]	0.98 (0.92, 1.04)		0.54	1.00 (0.91, 1.10)		0.98	0.97 (0.93, 1.02)		0.29	-0.37 (-1.05, 0.30)		0.28
T1	1.00	0.43	*0.20*	1.00	1.00	*0.96*	1.00	0.003	*0.002*	0.00	0.67	*0.58*
T2	1.01 (0.75, 1.37)			1.02 (0.64, 1.61)			1.15 (0.90, 1.46)			-1.30 (-4.79, 2.19)		
T3	0.84 (0.61, 1.16)			1.00 (0.61, 1.63)			0.75 (0.58, 0.97)			-1.48 (-5.01, 2.04)		
∑Parabens												
Continuous[d]	0.93 (0.86, 1.00)		0.06	0.99 (0.88, 1.12)		0.93	0.94 (0.88, 1.00)		0.06	-0.37 (-1.21, 0.47)		0.39
T1	1.00	0.13	*0.07*	1.00	0.34	*0.46*	1.00	0.02	*0.004*	0.00	0.81	*0.56*
T2	0.83 (0.62, 1.13)			1.27 (0.81, 2.00)			0.90 (0.71, 1.14)			0.28 (-3.19, 3.74)		
T3	0.72 (0.52, 0.99)			0.92 (0.55, 1.52)			0.69 (0.53, 0.89)			-0.88 (-4.57, 2.80)		

HR = hazard ratio; FEV_1%= forced expiratory volume in 1 second expressed in percent predicted; CI = confidence interval; ∑Dichlorophenols = molar sum of 2-Dichlorophenols (2,4-, 2,5-dichlorophenols); ∑Parabens = molar sum of parabens (Methyl-, Ethyl-, Propyl-, Butyl-parabens).

[a] Models adjusted for creatinine, centre, residence area, parental history of asthma or allergies, maternal ethnicity, maximal parental education level, maternal or passive smoking during pregnancy, postnatal passive smoking, older siblings, day-care. Missing values in covariates were imputed for at least one covariate in 277 boys, using the MICE multiple imputation method (100 imputations were performed) [b] additionally adjusted for child's height and age.

[c] Crude concentrations.

[d] Estimates for 1 unit increase in ln-transformed standardized concentration.

[e] p-values of heterogeneity test.

Italicized p-values are p-values of monotonic trend test.

Table S5. Adjusted associations between pregnancy phthalate metabolites raw (non-standardized) concentrations and respiratory outcomes (n=587) and FEV_1% (n=228) in boys. Models additionally adjusted for creatinine.

	Wheezing (until age 5y)[a]			Asthma diagnosis (until age 5y)[a]			Bronchiolitis/Bronchitis (until age 3y)[a]			FEV_1%[b]		
	N = 587			N = 587			N = 587			N = 228		
Phthalate[c]	HR (95% CI)	p_{het}[e]	*p*-value	HR (95% CI)	p_{het}[e]	*p*-value	HR (95% CI)	p_{het}[e]	*p*-value	beta (95% CI)	p_{het}[e]	*p*-value
∑LMW												
Continuous[d]	0.97 (0.84, 1.12)		0.69	0.97 (0.78, 1.21)		0.80	1.00 (0.89, 1.12)		1.00	-0.43 (-2.14, 1.27)		0.62
T1	1.00	0.80	*0.86*	1.00	0.94	*0.75*	1.00	0.71	*0.72*	0.00	0.16	*0.06*
T2	1.10 (0.79, 1.52)			0.94 (0.58, 1.52)			0.92 (0.71, 1.19)			0.35 (-3.23, 3.92)		
T3	1.01 (0.71, 1.43)			0.91 (0.54, 1.53)			1.01 (0.77, 1.34)			-3.00 (-6.96, 0.96)		
MEP												
Continuous[d]	0.99 (0.88, 1.11)		0.86	1.03 (0.87, 1.22)		0.72	1.02 (0.94, 1.12)		0.63	-0.10 (-1.45, 1.24)		0.88
T1	1.00	0.87	*0.80*	1.00	0.99	*0.90*	1.00	0.75	*0.99*	0.00	0.67	*0.51*
T2	1.07 (0.77, 1.47)			0.99 (0.61, 1.60)			1.10 (0.85, 1.42)			0.87 (-2.65, 4.39)		
T3	0.99 (0.71, 1.38)			1.02 (0.62, 1.69)			1.04 (0.80, 1.36)			-0.77 (-4.72, 3.19)		
MnBP												
Continuous[d]	1.03 (0.92, 1.16)		0.62	1.00 (0.83, 1.19)		0.96	0.98 (0.89, 1.07)		0.61	-0.35 (-1.69, 0.99)		0.61
T1	1.00	0.64	*0.36*	1.00	0.64	*0.89*	1.00	0.69	*0.98*	0.00	0.41	*0.34*
T2	1.01 (0.73, 1.40)			1.23 (0.76, 1.96)			0.90 (0.69, 1.16)			1.47 (-2.13, 5.09)		
T3	1.15 (0.81, 1.64)			1.04 (0.61, 1.79)			0.96 (0.73, 1.28)			-0.89 (-4.89, 3.11)		
MiBP												
Continuous[d]	0.98 (0.84, 1.14)		0.76	1.03 (0.81, 1.30)		0.82	1.02 (0.90, 1.16)		0.72	-1.34 (-3.02, 0.34)		0.12
T1	1.00	0.28	*0.22*	1.00	0.36	*0.47*	1.00	0.92	*0.96*	0.00	0.14	*0.06*
T2	0.90 (0.65, 1.25)			0.78 (0.48, 1.27)			0.95 (0.74, 1.22)			0.53 (-3.07, 4.14)		
T3	1.17 (0.83, 1.66)			1.11 (0.65, 1.87)			0.99 (0.75, 1.31)			-3.01 (-7.05, 1.03)		
∑HMW												
Continuous[d]	1.05 (0.90, 1.23)		0.54	1.14 (0.90, 1.45)		0.28	0.90 (0.79, 1.03)		0.13	-1.26 (-3.06, 0.55)		0.17
T1	1.00	0.07	*0.21*	1.00	0.13	*0.20*	1.00	0.12	*0.09*	0.00	0.09	*0.03*
T2	1.46 (1.05, 2.03)			1.64 (1.00, 2.69)			1.05 (0.82, 1.36)			-0.36 (-3.97, 3.24)		
T3	1.36 (0.95, 1.93)			1.57 (0.91, 2.68)			0.81 (0.61, 1.08)			-4.03 (-8.08, -0.02)		
MCPP												
Continuous[d]	1.03 (0.89, 1.20)		0.68	0.98 (0.77, 1.24)		0.85	0.90 (0.80, 1.02)		0.11	-0.49 (-2.32, 1.35)		0.60
T1	1.00	0.55	*0.28*	1.00	0.20	*0.94*	1.00	0.77	*0.92*	0.00	0.15	*0.87*
T2	1.08 (0.78, 1.49)			1.50 (0.93, 2.41)			0.91 (0.70, 1.18)			-3.59 (-7.19, 0.01)		
T3	1.21 (0.86, 1.69)			1.13 (0.65, 1.94)			0.96 (0.73, 1.26)			-2.00 (-5.89, 1.90)		
MBzP												
Continuous[d]	0.98 (0.86, 1.11)		0.75	1.17 (0.97, 1.41)		0.10	0.97 (0.87, 1.07)		0.51	-0.23 (-1.73, 1.25)		0.75
T1	1.00	0.87	*0.63*	1.00	0.14	*0.12*	1.00	0.28	*0.84*	0.00	0.82	*0.86*
T2	0.96 (0.71, 1.37)			1.51 (0.91, 2.49)			1.22 (0.94, 1.58)			-1.20 (-4.94, 2.54)		
T3	1.07 (0.76, 1.51)			1.68 (0.98, 2.86)			1.06 (0.79, 1.40)			-0.79 (-4.79, 3.22)		
MCNP												
Continuous[d]	1.10 (0.98, 1.24)		0.10	1.15 (0.97, 1.36)		0.12	0.98 (0.89, 1.08)		0.64	0.51 (-0.90, 1.92)		0.48
T1	1.00	0.05	*0.02*	1.00	0.20	*0.07*	1.00	0.62	*0.56*	0.00	0.12	*0.79*
T2	1.05 (0.76, 1.46)			1.14 (0.68, 1.89)			1.12 (0.87, 1.45)			-3.50 (-7.17, 0.17)		
T3	1.44 (1.03, 2.01)			1.54 (0.93, 2.55)			1.12 (0.86, 1.47)			-0.72 (-4.58, 3.15)		
MCOP												
Continuous[d]	1.03 (0.89, 1.20)		0.67	1.04 (0.84, 1.29)		0.72	1.08 (0.96, 1.22)		0.19	-1.17 (-2.77, 0.42)		0.15
T1	1.00	0.84	*0.78*	1.00	0.75	*0.71*	1.00	0.86	*0.87*	0.00	0.64	*0.37*
T2	1.10 (0.80, 1.51)			1.20 (0.74, 1.93)			1.07 (0.83, 1.38)			-0.36 (-3.92, 3.20)		
T3	1.07 (0.77, 1.50)			1.14 (0.69, 1.90)			1.04 (0.79, 1.36)			-1.70 (-5.51, 2.10)		
MEHHP												
Continuous[d]	1.05 (0.91, 1.20)		0.54	1.07 (0.86, 1.32)		0.54	0.95 (0.85, 1.07)		0.41	-1.12 (-2.64, 0.40)		0.15
T1	1.00	0.21	*0.37*	1.00	0.32	*0.66*	1.00	0.68	*0.87*	0.00	0.06	*0.03*
T2	1.34 (0.97, 1.85)			1.43 (0.89, 2.30)			1.10 (0.86, 1.42)			-3.14 (-6.61, 0.32)		
T3	1.25 (0.89, 1.75)			1.21 (0.72, 2.04)			1.01 (0.77, 1.32)			-4.49 (-8.30, -0.68)		
MEOHP												
Continuous[d]	1.05 (0.91, 1.21)		0.51	1.07 (0.86, 1.33)		0.54	0.93 (0.83, 1.04)		0.21	-1.42 (-2.98, 0.14)		0.08
T1	1.00	0.27	*0.24*	1.00	0.55	*0.72*	1.00	0.77	*0.48*	0.00	0.25	*0.09*
T2	1.28 (0.92, 1.77)			1.30 (0.81, 2.10)			0.98 (0.76, 1.27)			-1.03 (-4.64, 2.57)		
T3	1.28 (0.91, 1.80)			1.17 (0.69, 1.98)			0.91 (0.70, 1.20)			-3.30 (-7.29, 0.69)		
MECPP												
Continuous[d]	1.07 (0.92, 1.25)		0.38	1.11 (0.88, 1.40)		0.37	0.92 (0.81, 1.05)		0.20	-1.38 (-3.08, 0.32)		0.11
T1	1.00	0.30	*0.57*	1.00	0.41	*0.62*	1.00	0.84	*0.55*	0.00	0.32	*0.15*
T2	1.30 (0.93, 1.80)			1.40 (0.86, 2.27)			0.98 (0.76, 1.27)			-1.93 (-5.67, 1.81)		
T3	1.19 (0.84, 1.70)			1.25 (0.74, 2.14)			0.92 (0.70, 1.22)			-3.10 (-7.15, 0.96)		
MEHP												
Continuous[d]	1.01 (0.89, 1.14)	0.43	0.90	1.03 (0.85, 1.23)		0.79	0.92 (0.83, 1.01)		0.09	-1.02 (-2.33, 0.28)		0.12
T1	1.00		*0.30*	1.00	0.62	*0.45*	1.00	0.52	*0.64*	0.00	0.27	*0.17*
T2	0.93 (0.67, 1.29)			0.92 (0.57, 1.49)			0.86 (0.67, 1.11)			0.23 (-3.33, 3.80)		
T3	1.14 (0.82, 1.58)			1.16 (0.72, 1.88)			0.91 (0.70, 1.19)			-3.10 (-6.25, 1.22)		
∑DEHP												
Continuous[d]	1.05 (0.90, 1.22)		0.52	1.08 (0.86, 1.36)		0.50	0.92 (0.82, 1.04)		0.20	-1.38 (-3.02, 0.26)		0.10
T1	1.00	0.09	*0.33*	1.00	0.23	*0.60*	1.00	0.94	*0.78*	0.00	0.24	*0.19*
T2	1.45 (1.04, 2.01)			1.52 (0.94, 2.47)			0.96 (0.74, 1.24)			-2.71 (-6.28, 0.87)		
T3	1.30 (0.92, 1.84)			1.29 (0.75, 2.20)			0.96 (0.73, 1.26)			-3.05 (-7.02, 0.91)		

HR = hazard ratio; FEV_1%= forced expiratory volume in 1 second expressed in percent predicted; CI = confidence interval; ∑LMW = molar sum of Low Molecular Weight phthalates (MEP, MnBP, MiBP); ∑HMW = molar sum of High Molecular Weight phthalates (MCPP, MBzP, MCNP, MCOP, MEHHP, MEOHP, MECPP, MEHP); ∑DEHP = molar sum of di(2-ethylhexyl) phthalate metabolites (MEHHP, MEOHP, MECPP, MEHP). Parent compounds and associated metabolites are detailed in Table S1 (Supplemental material)

[a] Models adjusted for creatinine, centre, residence area, parental history of asthma or allergies, maternal ethnicity, maximal parental education level, maternal or passive smoking during pregnancy, postnatal passive smoking, older siblings, day-care. Missing values in covariates were imputed for at least one covariate in 277 boys, using the MICE multiple imputation method (100 imputations were performed) [b] additionally adjusted for child's height and age.
[c] Crude concentrations.
[d] Estimates for 1 unit increase in ln-transformed standardized concentration.
[e] p-values of heterogeneity test.
Italicized p-values are p-values of monotonic trend test.

Table S6. Adjusted associations between pregnancy phenols standardized concentrations and respiratory outcomes (n=447) and FEV_1% (n=171) in boys from non-smoking mothers.

	Wheezing (until age 5y)[a] N = 447			Asthma diagnosis (until age 5y)[a] N = 447			Bronchiolitis/Bronchitis (until age 3y)[a] N = 447			FEV_1%[b] N = 171		
Phenol[c]	HR (95% CI)	p_{het}[e]	*p*-value	HR (95% CI)	p_{het}[e]	*p*-value	HR (95% CI)	p_{het}[e]	*p*-value	beta (95% CI)	p_{het}[e]	*p*-value
2,4-Dichlorophenol												
Continuous[d]	1.04 (0.92, 1.18)		0.53	1.04 (0.86, 1.25)		0.72	0.95 (0.85, 1.06)		0.36	0.76 (-0.76, 2.28)		0.32
T1	1.00	0.46	*0.90*	1.00	0.80	*0.99*	1.00	0.58	*0.30*	0.00	0.58	*0.97*
T2	1.25 (0.88, 1.80)			1.19 (0.70, 2.02)			0.96 (0.72, 1.27)			2.23 (-2.14, 6.61)		
T3	1.11 (0.77, 1.59)			1.06 (0.62, 1.81)			0.86 (0.65, 1.14)			0.70 (-3.57, 4.97)		
2,5-Dichlorophenol												
Continuous[d]	1.06 (0.98, 1.16)		0.16	1.05 (0.92, 1.20)		0.46	0.98 (0.91, 1.05)		0.52	0.46 (-0.58, 1.51)		0.38
T1	1.00	0.02	*0.29*	1.00	0.13	*0.43*	1.00	0.96	*0.86*	0.00	0.97	*0.90*
T2	1.70 (1.17, 2.48)			1.76 (1.01, 3.05)			1.03 (0.77, 1.38)			0.54 (-3.79, 4.87)		
T3	1.46 (1.01, 2.12)			1.50 (0.86, 2.62)			0.99 (0.74, 1.32)			0.43 (-3.84, 4.70)		
∑Dichlorophenols												
Continuous[d]	1.06 (0.97, 1.16)		0.19	1.05 (0.91, 1.20)		0.52	0.97 (0.90, 1.05)		0.48	0.51 (-0.58, 1.60)		0.36
T1	1.00	0.11	*0.43*	1.00	0.11	*0.54*	1.00	0.92	*1.00*	0.00	0.97	*0.99*
T2	1.48 (1.02, 2.15)			1.80 (1.04, 3.12)			1.06 (0.79, 1.42)			0.52 (-3.77, 4.80)		
T3	1.32 (0.92, 1.91)			1.45 (0.83, 2.54)			1.02 (0.77, 1.36)			0.16 (-4.10, 4.42)		
Bisphenol A												
Continuous[d]	1.02 (0.83, 1.24)		0.87	1.23 (0.93, 1.62)		0.15	1.16 (0.98, 1.37)		0.08	-0.25 (-2.43, 1.93)		0.82
T1	1.00	0.70	*0.43*	1.00	0.26	*0.10*	1.00	0.38	*0.20*	0.00	0.60	*0.35*
T2	1.11 (0.77, 1.59)			1.14 (0.63, 2.05)			1.00 (0.75, 1.33)			-1.92 (-6.12, 2.28)		
T3	1.17 (0.81, 1.69)			1.54 (0.89, 2.66)			1.19 (0.89, 1.58)			-1.86 (-6.18, 2.46)		
Benzophenone-3												
Continuous[d]	0.95 (0.87, 1.04)		0.29	1.00 (0.88, 1.14)		0.99	0.99 (0.93, 1.07)		0.88	-0.58 (-1.60, 0.44)		0.26
T1	1.00	0.11	*0.15*	1.00	0.14	*0.52*	1.00	0.94	*0.75*	0.00	0.36	*0.40*
T2	0.75 (0.53, 1.07)			0.59 (0.35, 1.02)			0.98 (0.74, 1.31)			-2.59 (-6.81, 1.62)		
T3	0.69 (0.48, 1.00)			0.69 (0.40, 1.16)			0.95 (0.71, 1.27)			-2.73 (-6.97, 1.51)		
Triclosan												
Continuous[d]	0.99 (0.94, 1.05)		0.78	0.99 (0.91, 1.08)		0.79	1.01 (0.96, 1.05)		0.77	0.08 (-0.61, 0.76)		0.83
T1	1.00	0.77	*0.48*	1.00	0.71	*0.44*	1.00	0.53	*0.71*	0.00	0.92	*0.69*
T2	0.96 (0.68, 1.37)			1.06 (0.64, 1.75)			1.16 (0.87, 1.53)			-0.03 (-4.18, 4.12)		
T3	0.88 (0.62, 1.25)			0.84 (0.49, 1.46)			1.01 (0.76, 1.34)			0.71 (-3.50, 4.99)		
Methyl-paraben												
Continuous[d]	0.91 (0.83, 1.00)		0.05	0.98 (0.85, 1.12)		0.72	0.96 (0.89, 1.03)		0.24	-0.48 (-1.45, 0.49)		0.33
T1	1.00	0.09	*0.24*	1.00	0.92	*0.93*	1.00	0.12	*0.09*	0.00	0.24	*0.18*
T2	0.70 (0.49, 0.99)			1.12 (0.66, 1.89)			0.81 (0.61, 1.07)			1.62 (-2.59, 5.82)		
T3	0.75 (0.53, 1.06)			1.05 (0.61, 1.82)			0.75 (0.56, 1.00)			-1.98 (-6.02, 2.07)		
Ethyl-paraben												
Continuous[d]	0.99 (0.93, 1.07)		0.88	1.10 (0.99, 1.23)		0.08	1.00 (0.96, 1.06)		0.98	-0.57 (-1.32, 0.19)		0.14
T1	1.00	0.82	*0.53*	1.00	0.08	*0.05*	1.00	0.03	*0.38*	0.00	0.55	*0.28*
T2	1.04 (0.72, 1.49)			1.47 (0.83, 2.60)			1.41 (1.06, 1.87)			-0.35 (-4.56, 3.87)		
T3	1.12 (0.78, 1.62)			1.91 (1.08, 3.37)			1.03 (0.76, 1.39)			-2.11 (-6.26, 2.04)		
Propyl-paraben												
Continuous[d]	0.97 (0.90, 1.04)		0.40	1.01 (0.90, 1.14)		0.83	0.96 (0.91, 1.03)		0.25	-0.30 (-1.11, 0.52)		0.47
T1	1.00	0.71	*0.57*	1.00	0.75	*0.97*	1.00	0.34	*0.17*	0.00	0.91	*0.86*
T2	1.09 (0.77, 1.55)			1.22 (0.72, 2.07)			0.91 (0.69, 1.20)			-0.91 (-5.03, 3.20)		
T3	0.94 (0.66, 1.35)			1.08 (0.63, 1.86)			0.81 (0.61, 1.07)			-0.57 (-4.71, 3.56)		
Butyl-paraben												
Continuous[d]	0.97 (0.90, 1.05)		0.45	1.00 (0.89, 1.11)		0.93	0.98 (0.93, 1.04)		0.56	-0.43 (-1.23, 0.37)		0.29
T1	1.00	0.34	*0.35*	1.00	0.67	*0.85*	1.00	0.08	*0.08*	0.00	0.47	*0.34*
T2	1.21 (0.85, 1.73)			1.28 (0.75, 2.19)			1.20 (0.90, 1.60)			-1.72 (-5.85, 2.41)		
T3	0.94 (0.64, 1.38)			1.19 (0.67, 2.12)			0.87 (0.64, 1.17)			-2.56 (-6.74, 1.62)		
∑Parabens												
Continuous[d]	0.91 (0.83, 1.00)		0.04	0.98 (0.85, 1.13)		0.79	0.96 (0.89, 1.03)		0.26	-0.45 (-1.43, 0.52)		0.36
T1	1.00	0.15	*0.16*	1.00	0.82	*0.67*	1.00	0.18	*0.27*	0.00	0.52	*0.31*
T2	0.75 (0.53, 1.07)			1.10 (0.66, 1.83)			0.79 (0.60, 1.05)			0.73 (-3.48, 4.95)		
T3	0.73 (0.51, 1.05)			0.92 (0.53, 1.60)			0.81 (0.61, 1.07)			-1.63 (-5.70, 2.44)		

HR = hazard ratio; FEV_1%= forced expiratory volume in 1 second expressed in percent predicted; CI = confidence interval; ∑Dichlorophenols = molar sum of 2-Dichlorophenols (2,4-, 2,5-dichlorophenols); ∑Parabens = molar sum of parabens (Methyl-, Ethyl-, Propyl-, Butyl-parabens).

[a] Models adjusted for centre, residence area, parental history of asthma or allergies, maternal ethnicity, maximal parental education level, passive smoking during pregnancy, postnatal passive smoking, older siblings, day-care. Missing values in covariates were imputed using the MICE multiple imputation method (100 imputations were performed) [b] additionally adjusted for child's height and age.

[c] Standardized for urine sampling conditions (creatinine level, day and hour of sampling, gestational age, storage duration at room temperature and year of analysis), as detailed in Mortamais et al. (2012).

[d] Estimates for 1 unit increase in ln-transformed standardized concentration.

[e] p-values of heterogeneity test.

Italicized p-values are p-values of monotonic trend test.

Table S7. Adjusted associations between pregnancy phthalate metabolites standardized concentrations and respiratory outcomes (n=447) and FEV_1% (n=171) in boys from non-smoking mothers.

	Wheezing (until age 5y)[a]			Asthma diagnosis (until age 5y)[a]			Bronchiolitis/Bronchitis (until age 3y)[a]			FEV_1%[b]		
	N = 447			N = 447			N = 447			N = 171		
Phthalate[c]	HR (95% CI)	p_{het}[e]	*p*-value	HR (95% CI)	p_{het}[e]	*p*-value	HR (95% CI)	p_{het}[e]	*p*-value	beta (95% CI)	p_{het}[e]	*p*-value
∑LMW												
Continuous[d]	0.93 (0.78, 1.11)		0.42	1.01 (0.78, 1.32)		0.93	1.05 (0.91, 1.21)		0.49	-0.13 (-2.36, 2.10)		0.91
T1	1.00	0.74	*0.89*	1.00	0.05	*0.90*	1.00	0.64	*0.36*	0.00	0.64	*0.35*
T2	1.15 (0.81, 1.64)			1.84 (1.09, 3.10)			1.07 (0.80, 1.43)			-0.56 (-4.77, 3.65)		
T3	1.06 (0.74, 1.52)			1.18 (0.66, 2.12)			1.15 (0.86, 1.52)			-1.93 (-6.02, 2.17)		
MEP												
Continuous[d]	0.97 (0.84, 1.11)		0.62	1.10 (0.90, 1.34)		0.36	1.03 (0.92, 1.15)		0.60	-0.37 (-2.11, 1.37)		0.67
T1	1.00	0.97	*0.87*	1.00	0.55	*0.35*	1.00	0.92	*0.68*	0.00	0.77	*0.72*
T2	0.98 (0.69, 1.39)			1.25 (0.72, 2.15)			1.01 (0.76, 1.35)			0.81 (-3.26, 4.50)		
T3	1.02 (0.71, 1.46)			1.34 (0.78, 2.32)			1.06 (0.80, 1.41)			-0.69 (-4.91, 3.53)		
MnBP												
Continuous[d]	1.04 (0.91, 1.19)		0.52	1.01 (0.83, 1.24)		0.91	1.03 (0.92, 1.15)		0.65	0.22 (-1.36, 1.79)		0.79
T1	1.00	0.73	*0.47*	1.00	0.71	*0.91*	1.00	0.93	*0.84*	0.00	0.93	*0.75*
T2	0.97 (0.67, 1.39)			1.23 (0.73, 2.08)			0.95 (0.72, 1.27)			0.09 (-4.14, 4.31)		
T3	1.11 (0.78, 1.58)			1.04 (0.60, 1.81)			0.96 (0.72, 1.27)			-0.64 (-4.88, 3.60)		
MiBP												
Continuous[d]	0.95 (0.79, 1.14)		0.58	1.01 (0.77, 1.33)		0.92	0.98 (0.84, 1.14)		0.80	-0.51 (-2.62, 1.60)		0.63
T1	1.00	0.83	*0.94*	1.00	0.64	*0.71*	1.00	1.00	*0.95*	0.00	0.46	*0.23*
T2	0.89 (0.62, 1.29)			1.21 (0.71, 2.06)			1.00 (0.75, 1.34)			-0.11 (-4.34, 4.11)		
T3	0.96 (0.67, 1.37)			0.95 (0.55, 1.64)			1.01 (0.75, 1.35)			-2.28 (-6.36, 1.80)		
∑HMW												
Continuous[d]	1.08 (0.90, 1.29)		0.44	1.12 (0.84, 1.48)		0.45	0.92 (0.78, 1.07)		0.27	-0.79 (-2.99, 1.41)		0.48
T1	1.00	0.28	*0.64*	1.00	0.64	*0.45*	1.00	0.85	*0.68*	0.00	0.65	*0.61*
T2	1.34 (0.93, 1.92)			0.91 (0.53, 1.58)			1.04 (0.78, 1.37)			-1.96 (-6.19, 2.27)		
T3	1.16 (0.80, 1.68)			1.17 (0.69, 1.97)			0.95 (0.71, 1.27)			-1.23 (-5.39, 2.93)		
MCPP												
Continuous[d]	0.98 (0.82, 1.17)		0.85	0.94 (0.72, 1.23)		0.65	0.92 (0.79, 1.06)		0.25	0.08 (-2.08, 2.25)		0.94
T1	1.00	0.99	*0.90*	1.00	0.87	*0.62*	1.00	0.18	*0.14*	0.00	0.75	*0.83*
T2	0.99 (0.69, 1.40)			0.93 (0.55, 1.58)			1.11 (0.84, 1.46)			-0.95 (-5.14, 3.23)		
T3	0.98 (0.68, 1.40)			0.87 (0.50, 1.49)			0.85 (0.63, 1.14)			0.28 (-3.87, 4.83)		
MBzP												
Continuous[d]	1.01 (0.87, 1.17)		0.90	1.22 (0.99, 1.51)		0.06	0.96 (0.85, 1.08)		0.46	0.20 (-1.62, 2.01)		0.83
T1	1.00	0.80	*1.00*	1.00	0.28	*0.38*	1.00	0.67	*0.39*	0.00	0.10	*0.31*
T2	1.13 (0.78, 1.62)			1.56 (0.88, 2.77)			1.00 (0.75, 1.33)			-4.34 (-8.55, -0.13)		
T3	1.03 (0.72, 1.49)			1.42 (0.82, 2.47)			0.89 (0.67, 1.19)			-3.39 (-7.52, 0.73)		
MCNP												
Continuous[d]	1.04 (0.90, 1.19)		0.60	0.99 (0.80, 1.22)		0.91	0.93 (0.82, 1.04)		0.19	1.36 (-0.28, 3.01)		0.10
T1	1.00	0.70	*0.40*	1.00	0.24	*0.41*	1.00	0.95	*0.88*	0.00	0.09	*0.19*
T2	1.02 (0.71, 1.46)			1.60 (0.92, 2.80)			0.95 (0.72, 1.27)			-2.71 (6.83, 1.41)		
T3	1.15 (0.81, 1.64)			1.43 (0.82, 2.49)			0.97 (0.73, 1.28)			1.97 (-2.21, 6.14)		
MCOP												
Continuous[d]	0.97 (0.82, 1.16)		0.77	0.95 (0.73, 1.22)		0.67	1.06 (0.93, 1.22)		0.37	-1.29 (-3.10, 0.53)		0.16
T1	1.00	0.50	*0.31*	1.00	0.62	*0.82*	1.00	0.33	*0.82*	0.00	0.46	*0.37*
T2	0.86 (0.60, 1.22)			0.76 (0.44, 1.31)			1.21 (0.91, 1.61)			-2.54 (-6.75, 1.68)		
T3	0.81 (0.57, 1.16)			0.89 (0.53, 1.50)			1.01 (0.75, 1.36)			-1.89 (-6.03, 2.25)		
MEHHP												
Continuous[d]	1.09 (0.92, 1.28)		0.32	1.04 (0.80, 1.34)		0.78	0.97 (0.85, 1.11)		0.64	-0.67 (-2.57, 1.23)		0.49
T1	1.00	0.37	*0.21*	1.00	0.93	*0.85*	1.00	0.89	*0.94*	0.00	0.63	*0.63*
T2	1.22 (0.84, 1.75)			1.07 (0.63, 1.83)			1.06 (0.80, 1.41)			-1.98 (-6.04, 2.08)		
T3	1.29 (0.90, 1.85)			0.97 (0.56, 1.67)			1.00 (0.75, 1.34)			-1.14 (-5.37, 3.10)		
MEOHP												
Continuous[d]	1.08 (0.92, 1.28)		0.34	1.05 (0.81, 1.36)		0.70	0.95 (0.83, 1.09)		0.49	-1.06 (-3.01, 0.89)		0.29
T1	1.00	0.48	*0.31*	1.00	0.69	*0.85*	1.00	0.95	*0.92*	0.00	0.43	*0.21*
T2	1.20 (0.83, 1.72)			0.81 (0.47, 1.40)			1.05 (0.79, 1.39)			-2.04 (-6.17, 2.10)		
T3	1.24 (0.86, 1.78)			1.00 (0.59, 1.68)			1.02 (0.77, 1.36)			-2.63 (-6.87, 1.60)		
MECPP												
Continuous[d]	1.05 (0.88, 1.25)		0.58	1.07 (0.82, 1.41)		0.60	0.95 (0.82, 1.10)		0.48	-1.15 (-3.17, 0.86)		0.26
T1	1.00	0.40	*0.36*	1.00	0.97	*0.80*	1.00	0.96	*0.79*	0.00	0.12	*0.04*
T2	1.26 (0.88, 1.81)			1.04 (0.60, 1.79)			1.00 (0.75, 1.33)			-2.35 (-6.48, 1.78)		
T3	1.23 (0.85, 1.77)			1.07 (0.63, 1.83)			1.04 (0.78, 1.38)			-4.24 (-8.30, -0.18)		
MEHP												
Continuous[d]	1.05 (0.91, 1.22)		0.50	1.00 (0.81, 1.25)		0.97	0.95 (0.84, 1.06)		0.35	-1.08 (-2.70, 0.53)		0.19
T1	1.00	0.68	*0.40*	1.00	0.69	*0.71*	1.00	0.70	*0.54*	0.00	0.49	*0.29*
T2	1.09 (0.76, 1.57)			0.84 (0.49, 1.44)			0.90 (0.68, 1.20)			0.25 (-3.94, 4.43)		
T3	1.17 (0.82, 1.67)			1.05 (0.63, 1.76)			0.90 (0.68, 1.20)			-2.05 (-6.20, 2.11)		
∑DEHP												
Continuous[d]	1.07 (0.90, 1.28)		0.42	1.05 (0.80, 1.37)		0.72	0.95 (0.82, 1.09)		0.45	-1.04 (-3.03, 0.96)		0.30
T1	1.00	0.30	*0.40*	1.00	0.97	*0.93*	1.00	0.89	*0.90*	0.00	0.44	*0.34*
T2	1.32 (0.92, 1.90)			0.95 (0.56, 1.63)			1.06 (0.80, 1.41)			-2.53 (-6.61, 1.54)		
T3	1.23 (0.85, 1.77)			1.01 (0.60, 1.71)			0.99 (0.75, 1.33)			-1.98 (-6.15, 2.19)		

HR = hazard ratio; FEV_1%= forced expiratory volume in 1 second expressed in percent predicted; CI = confidence interval; ∑LMW = molar sum of Low Molecular Weight phthalates (MEP, MnBP, MiBP); ∑HMW = molar sum of High Molecular Weight phthalates (MCPP, MBzP, MCNP, MCOP, MEHHP, MEOHP, MECPP, MEHP); ∑DEHP = molar sum of di(2-ethylhexyl) phthalate metabolites (MEHHP, MEOHP, MECPP, MEHP). Parent compounds and associated metabolites are detailed in Table S1 (Supplemental material)

[a] Models adjusted for centre, residence area, parental history of asthma or allergies, maternal ethnicity, maximal parental education level, passive smoking during pregnancy, postnatal passive smoking, older siblings, day-care. Missing values in covariates were imputed using the MICE multiple imputation method (100 imputations were performed) [b] additionally adjusted for child's height and age.

[c] Standardized for urine sampling conditions (creatinine level, day and hour of sampling, gestational age, storage duration at room temperature and year of analysis), as detailed in Mortamais et al. (2012).

[d] Estimates for 1 unit increase in ln-transformed standardized concentration.

[e] p-values of heterogeneity test.

Italicized p-values are p-values of monotonic trend test.

Table S8. Adjusted associations between pregnancy phenols standardized concentrations and respiratory outcomes (n=470) and FEV_1% (n=185) in boys from non-asthmatic parents.

	Wheezing (until age 5y)[a] N = 470			Asthma diagnosis (until age 5y)[a] N = 470			Bronchiolitis/Bronchitis (until age 3y)[a] N = 470			FEV_1%[b] N = 185		
Phenol[c]	HR (95% CI)	p_{het}[e]	*p*-value	HR (95% CI)	p_{het}[e]	*p*-value	HR (95% CI)	p_{het}[e]	*p*-value	beta (95% CI)	p_{het}[e]	*p*-value
2,4-Dichlorophenol												
Continuous[d]	1.06 (0.94, 1.20)		0.36	0.95 (0.78, 1.16)		0.62	0.95 (0.86, 1.06)		0.38	-0.30 (-1.77, 1.17)		0.69
T1	1.00	0.73	*0.91*	1.00	0.34	*0.38*	1.00	0.52	*0.34*	0.00	0.91	*0.76*
T2	1.15 (0.81, 1.63)			1.28 (0.76, 2.14)			1.06 (0.80, 1.39)			-0.73 (-4.73, 3.28)		
T3	1.06 (0.75, 1.51)			0.86 (0.49, 1.49)			0.90 (0.69, 1.18)			-0.84 (-4.81, 3.14)		
2,5-Dichlorophenol												
Continuous[d]	1.08 (0.99, 1.18)		0.08	1.01 (0.88, 1.16)		0.86	0.99 (0.92, 1.07)		0.86	-0.02 (-1.00, 1.03)		0.97
T1	1.00	0.11	*0.22*	1.00	0.23	*0.43*	1.00	0.76	*0.58*	0.00	0.96	*0.78*
T2	1.42 (0.99, 2.03)			1.59 (0.91, 2.76)			1.08 (0.82, 1.44)			0.06 (-3.91, 4.03)		
T3	1.40 (0.98, 2.00)			1.46 (0.84, 2.54)			1.11 (0.84, 1.46)			0.50 (-3.42, 4.42)		
∑Dichlorophenols												
Continuous[d]	1.08 (0.99, 1.18)		0.10	1.00 (0.87, 1.16)		0.95	0.99 (0.92, 1.07)		0.80	-0.02 (-1.09, 1.04)		0.97
T1	1.00	0.11	*0.16*	1.00	0.20	*0.28*	1.00	0.79	*0.49*	0.00	0.99	*0.91*
T2	1.39 (0.97, 1.99)			1.57 (0.90, 2.75)			1.02 (0.77, 1.35)			0.21 (-3.77, 4.19)		
T3	1.42 (1.00, 2.02)			1.54 (0.89, 2.68)			1.10 (0.83, 1.45)			0.27 (-3.67, 4.21)		
Bisphenol A												
Continuous[d]	0.94 (0.77, 1.15)		0.56	1.25 (0.93, 1.66)		0.14	1.11 (0.95, 1.29)		0.18	-1.40 (-3.47, 0.67)		0.18
T1	1.00	0.86	*0.84*	1.00	0.47	*0.22*	1.00	0.50	*0.26*	0.00	0.45	*0.25*
T2	0.91 (0.64, 1.28)			1.12 (0.63, 1.98)			1.10 (0.83, 1.45)			-1.79 (-5.69, 2.10)		
T3	0.95 (0.66, 1.34)			1.38 (0.80, 2.39)			1.18 (0.89, 1.57)			-2.49 (-6.47, 1.49)		
Benzophenone-3												
Continuous[d]	0.95 (0.87, 1.03)		0.21	0.96 (0.84, 1.10)		0.57	1.00 (0.93, 1.07)		0.97	-0.80 (-1.82, 0.22)		0.12
T1	1.00	0.13	*0.05*	1.00	0.36	*0.17*	1.00	0.78	*0.83*	0.00	0.36	*0.16*
T2	0.89 (0.63, 1.24)			0.86 (0.52, 1.43)			0.91 (0.69, 1.19)			-0.75 (-4.65, 3.14)		
T3	0.69 (0.48, 0.99)			0.67 (0.38, 1.16)			0.93 (0.71, 1.24)			-2.73 (-6.61, 1.15)		
Triclosan												
Continuous[d]	0.99 (0.93, 1.04)		0.62	0.99 (0.91, 1.08)		0.89	0.99 (0.95, 1.04)		0.70	0.07 (-0.57, 0.71)		0.83
T1	1.00	0.97	*0.80*	1.00	1.00	*0.93*	1.00	0.94	*0.73*	0.00	0.99	*0.94*
T2	0.98 (0.70, 1.39)			1.00 (0.59, 1.70)			0.99 (0.75, 1.30)			-0.16 (-4.11, 3.79)		
T3	0.96 (0.68, 1.35)			0.98 (0.58, 1.67)			0.95 (0.73, 1.25)			0.18 (-4.07, 3.70)		
Methyl-paraben												
Continuous[d]	0.93 (0.85, 1.02)		0.11	1.02 (0.89, 1.17)		0.75	0.94 (0.87, 1.01)		0.10	-0.46 (-1.40, 0.49)		0.34
T1	1.00	0.09	*0.16*	1.00	0.87	*0.94*	1.00	0.03	*0.01*	0.00	0.18	*0.31*
T2	0.71 (0.50, 1.00)			1.14 (0.68, 1.91)			0.81 (0.62, 1.06)			2.44 (-1.47, 6.35)		
T3	0.73 (0.52, 1.03)			1.01 (0.58, 1.75)			0.68 (0.52, 0.90)			-1.21 (-5.02, 2.59)		
Ethyl-paraben												
Continuous[d]	1.02 (0.95, 1.09)		0.58	1.11 (0.99, 1.23)		0.08	0.99 (0.94, 1.04)		0.69	-0.85 (-1.57, -0.13)		0.02
T1	1.00	0.49	*0.82*	1.00	0.08	*0.17*	1.00	0.001	*0.08*	0.00	0.10	*0.04*
T2	1.23 (0.87, 1.75)			1.80 (1.03, 3.16)			1.51 (1.15, 1.98)			-1.98 (-5.79, 1.83)		
T3	1.13 (0.79, 1.61)			1.82 (1.02, 3.25)			0.95 (0.71, 1.26)			-4.28 (-8.15, -0.41)		
Propyl-paraben												
Continuous[d]	0.94 (0.88, 1.02)		0.12	1.00 (0.90, 1.12)		0.95	0.96 (0.91, 1.02)		0.19	-0.19 (-0.98, 0.60)		0.63
T1	1.00	0.62	*0.45*	1.00	0.91	*0.75*	1.00	0.27	*0.22*	0.00	0.46	*0.46*
T2	0.88 (0.63, 1.24)			0.92 (0.55, 1.61)			0.84 (0.64, 1.11)			1.80 (-2.06, 5.66)		
T3	0.85 (0.60, 1.20)			1.06 (0.62, 1.81)			0.81 (0.61, 1.06)			-0.62 (-4.52, 3.28)		
Butyl-paraben												
Continuous[d]	0.99 (0.92, 1.06)		0.77	0.99 (0.88, 1.11)		0.87	0.98 (0.93, 1.03)		0.45	-0.91 (-1.68, -0.14)		0.02
T1	1.00	0.46	*0.31*	1.00	0.98	*0.84*	1.00	0.004	0.01	0.00	0.15	*0.06*
T2	1.11 (0.79, 1.57)			1.00 (0.59, 1.70)			1.26 (0.96, 1.66)			-1.30 (-5.12, 2.52)		
T3	0.89 (0.62, 1.29)			1.05 (0.60, 1.85)			0.79 (0.59, 1.06)			-3.78 (-7.63, 0.07)		
∑Parabens												
Continuous[d]	0.93 (0.85, 1.01)		0.09	1.02 (0.89, 1.17)		0.79	0.95 (0.88, 1.02)		0.13	-0.48 (-1.43, 0.47)		0.32
T1	1.00	0.13	*0.14*	1.00	0.89	*0.73*	1.00	0.07	*0.06*	0.00	0.43	*0.67*
T2	0.75 (0.54, 1.06)			1.06 (0.64, 1.78)			0.78 (0.60, 1.02)			2.07 (-1.88, 6.01)		
T3	0.73 (0.52, 1.04)			0.93 (0.54, 1.61)			0.74 (0.56, 0.98)			-0.38 (-4.19, 3.44)		

HR = hazard ratio; FEV_1%= forced expiratory volume in 1 second expressed in percent predicted; CI = confidence interval; ∑Dichlorophenols = molar sum of 2-Dichlorophenols (2,4-, 2,5-dichlorophenols); ∑Parabens = molar sum of parabens (Methyl-, Ethyl-, Propyl-, Butyl-parabens).

[a] Models adjusted for centre, residence area, parental history of allergies, maternal ethnicity, maximal parental education level, maternal or passive smoking during pregnancy, postnatal passive smoking, older siblings, day-care. Missing values in covariates were imputed using the MICE multiple imputation method (100 imputations were performed) [b] additionally adjusted for child's height and age.

[c] Standardized for urine sampling conditions (creatinine level, day and hour of sampling, gestational age, storage duration at room temperature and year of analysis), as detailed in Mortamais et al. (2012).

[d] Estimates for 1 unit increase in ln-transformed standardized concentration.

[e] p-values of heterogeneity test.

Italicized p-values are p-values of monotonic trend test.

Table S9. Adjusted associations between pregnancy phthalate metabolites standardized concentrations and respiratory outcomes (n=470) and FEV_1% (n=185) in boys from non-asthmatic parents.

	Wheezing (until age 5y)[a]			Asthma diagnosis (until age 5y)[a]			Bronchiolitis/Bronchitis (until age 3y)[a]			FEV_1%[b]		
	N = 470			N = 470			N = 470			N = 185		
Phthalate[c]	HR (95% CI)	p_{het}[e]	*p*-value	HR (95% CI)	p_{het}[e]	*p*-value	HR (95% CI)	p_{het}[e]	*p*-value	beta (95% CI)	p_{het}[e]	*p*-value
∑LMW												
Continuous[d]	0.90 (0.76, 1.07)		0.25	0.92 (0.71, 1.20)		0.55	0.97 (0.85, 1.11)		0.71	-1.29 (-3.26, 0.68)		0.20
T1	1.00	0.42	*0.26*	1.00	0.88	*0.67*	1.00	0.84	*0.61*	0.00	0.10	*0.03*
T2	0.85 (0.60, 1.19)			1.04 (0.62, 1.74)			0.94 (0.72, 1.24)			-0.32 (-4.18, 3.54)		
T3	0.80 (0.56, 1.13)			0.90 (0.52, 1.56)			0.92 (0.70, 1.22)			-3.71 (-7.50, -0.07)		
MEP												
Continuous[d]	0.95 (0.83, 1.08)		0.43	1.01 (0.82, 1.24)		0.94	0.99 (0.90, 1.10)		0.91	-1.19 (-2.75, 0.36)		0.13
T1	1.00	0.65	*0.35*	1.00	0.80	*0.51*	1.00	0.69	*0.66*	0.00	0.43	*0.26*
T2	0.95 (0.67, 1.34)			0.92 (0.54, 1.57)			1.09 (0.83, 1.43)			-2.01 (-5.87, 1.86)		
T3	0.85 (0.60, 1.21)			0.83 (0.48, 1.43)			0.97 (0.73, 1.28)			-2.36 (-6.24, 1.51)		
MnBP												
Continuous[d]	1.00 (0.88, 1.14)		0.97	0.97 (0.78, 1.19)		0.74	0.95 (0.85, 1.06)		0.31	-0.18 (-1.65, 1.30)		0.81
T1	1.00	0.97	*0.85*	1.00	0.74	*0.56*	1.00	0.10	*0.34*	0.00	0.42	*0.51*
T2	1.04 (0.74, 1.47)			0.85 (0.50, 1.42)			0.75 (0.57, 0.98)			1.76 (-2.20, 5.72)		
T3	1.04 (0.73, 1.49)			0.83 (0.48, 1.42)			0.80 (0.61, 1.06)			-0.72 (-4.75, 3.32)		
MiBP												
Continuous[d]	1.01 (0.85, 1.20)		0.88	1.15 (0.87, 1.51)		0.33	1.08 (0.94, 1.24)		0.29	-0.77 (-2.68, 1.14)		0.43
T1	1.00	0.81	*0.83*	1.00	0.98	*0.97*	1.00	0.86	*0.59*	0.00	0.38	*0.23*
T2	0.91 (0.63, 1.30)			1.06 (0.62, 1.80)			1.03 (0.78, 1.37)			0.80 (-3.11, 4.71)		
T3	1.01 (0.71, 1.43)			1.02 (0.60, 1.75)			1.08 (0.82, 1.43)			-1.88 (-5.76, 2.01)		
∑HMW												
Continuous[d]	1.12 (0.93, 1.34)		0.23	1.15 (0.86, 1.53)		0.35	0.95 (0.82, 1.10)		0.49	-1.31 (-3.47, 0.84)		0.23
T1	1.00	0.39	*0.89*	1.00	0.93	*0.81*	1.00	0.55	*0.37*	0.00	0.23	*0.76*
T2	1.24 (0.88, 1.76)			1.06 (0.62, 1.80)			0.88 (0.67, 1.16)			-3.33 (-7.18, 0.52)		
T3	1.03 (0.72, 1.47)			0.95 (0.56, 1.64)			0.87 (0.66, 1.14)			-1.46 (-5.36, 2.44)		
MCPP												
Continuous[d]	0.99 (0.84, 1.17)		0.90	0.97 (0.75, 1.27)		0.85	0.87 (0.76, 1.00)		0.04	-0.28 (-2.28, 1.72)		0.78
T1	1.00	0.56	*0.80*	1.00	0.98	*0.86*	1.00	0.15	*0.08*	0.00	0.23	*0.50*
T2	1.18 (0.83, 1.65)			0.98 (0.57, 1.66)			1.05 (0.81, 1.38)			-2.66 (-6.47, 1.15)		
T3	1.00 (0.70, 1.43)			0.95 (0.56, 1.63)			0.81 (0.61, 1.07)			0.38 (-3.51, 4.27)		
MBzP												
Continuous[d]	1.01 (0.87, 1.16)		0.95	1.16 (0.92, 1.45)		0.20	1.00 (0.89, 1.12)		0.98	-0.82 (-2.60, 0.95)		0.36
T1	1.00	0.75	*0.53*	1.00	0.62	*0.95*	1.00	0.97	*0.96*	0.00	0.13	*0.05*
T2	1.04 (0.74, 1.48)			1.29 (0.75, 2.23)			0.97 (0.74, 1.28)			-2.00 (-5.91, 1.92)		
T3	0.92 (0.64, 1.31)			1.08 (0.61, 1.89)			1.00 (0.76, 1.31)			-3.92 (-7.77, -0.08)		
MCNP												
Continuous[d]	1.12 (0.98, 1.28)		0.09	1.12 (0.92, 1.36)		0.27	0.98 (0.88, 1.09)		0.69	-0.06 (-1.74, 1.62)		0.94
T1	1.00	0.31	*0.15*	1.00	0.60	*0.46*	1.00	0.96	*0.98*	0.00	0.51	*0.61*
T2	1.16 (0.81, 1.65)			1.27 (0.73, 2.20)			1.04 (0.79, 1.37)			-2.14 (-6.02, 1.73)		
T3	1.31 (0.93, 1.85)			1.29 (0.75, 2.21)			1.02 (0.77, 1.33)			-1.82 (-5.79, 2.15)		
MCOP												
Continuous[d]	1.07 (0.91, 1.27)		0.40	1.09 (0.85, 1.38)		0.50	1.15 (1.02, 1.31)		0.03	-1.78 (-3.50, -0.06)		0.04
T1	1.00	0.68	*0.69*	1.00	0.81	*0.66*	1.00	0.63	*0.66*	0.00	0.11	*0.04*
T2	1.12 (0.79, 1.58)			0.91 (0.53, 1.57)			1.14 (0.87, 1.50)			-0.87 (-4.74, 3.00)		
T3	0.96 (0.68, 1.37)			1.09 (0.65, 1.85)			1.09 (0.83, 1.44)			-3.91 (-7.77, -0.05)		
MEHHP												
Continuous[d]	1.14 (0.96, 1.36)		0.13	1.10 (0.85, 1.42)		0.48	1.00 (0.88, 1.14)		0.98	-0.86 (-2.70, 0.97)		0.35
T1	1.00	0.21	*0.58*	1.00	0.37	*0.76*	1.00	0.62	*0.82*	0.00	0.22	*0.75*
T2	1.37 (0.97, 1.95)			1.38 (0.81, 2.35)			1.12 (0.85, 1.47)			-3.20 (-6.98, 0.58)		
T3	1.18 (0.82, 1.69)			1.00 (0.57, 1.74)			0.99 (0.75, 1.31)			-0.79 (-4.73, 3.15)		
MEOHP												
Continuous[d]	1.13 (0.95, 1.33)		0.16	1.08 (0.83, 1.41)		0.56	0.97 (0.85, 1.11)		0.68	-1.25 (-3.13, 0.63)		0.19
T1	1.00	0.09	*0.66*	1.00	0.72	*0.54*	1.00	0.25	*0.62*	0.00	0.10	*0.51*
T2	1.46 (1.03, 2.07)			1.07 (0.64, 1.81)			1.19 (0.91, 1.57)			-4.19 (-8.02, -0.35)		
T3	1.15 (0.80, 1.66)			0.86 (0.50, 1.49)			0.96 (0.73, 1.28)			-1.74 (-5.62, 2.13)		
MECPP												
Continuous[d]	1.13 (0.95, 1.34)		0.17	1.13 (0.87, 1.49)		0.36	0.95 (0.82, 1.10)		0.48	-1.21 (-3.22, 0.80)		0.24
T1	1.00	0.11	*0.47*	1.00	0.78	*0.92*	1.00	0.91	*0.66*	0.00	0.28	*0.52*
T2	1.45 (1.02, 2.06)			1.21 (0.70, 2.07)			0.98 (0.75, 1.29)			-3.18 (-7.10, 0.74)		
T3	1.23 (0.86, 1.76)			1.07 (0.62, 1.85)			0.94 (0.72, 1.24)			-1.91 (-5.81, 2.00)		
MEHP												
Continuous[d]	1.04 (0.91, 1.20)		0.55	1.06 (0.86, 1.32)		0.57	0.93 (0.83, 1.04)		0.21	-0.81 (-2.32, 0.70)		0.29
T1	1.00	0.39	*0.19*	1.00	0.31	*0.17*	1.00	0.25	*0.75*	0.00	0.69	*0.39*
T2	1.00 (0.70, 1.43)			0.93 (0.53, 1.64)			0.81 (0.62, 1.07)			-0.34 (-4.21, 3.53)		
T3	1.23 (0.87, 1.73)			1.36 (0.81, 2.81)			0.99 (0.76, 1.30)			-1.61 (-5.51, 2.29)		
∑DEHP												
Continuous[d]	1.13 (0.95, 1.34)		0.18	1.10 (0.84, 1.45)		0.48	0.96 (0.83, 1.11)		0.57	-1.14 (-3.10, 0.82)		0.25
T1	1.00	0.10	*0.78*	1.00	0.66	*0.62*	1.00	0.69	*0.80*	0.00	0.16	*0.70*
T2	1.45 (1.02, 2.07)			1.16 (0.68, 1.98)			1.10 (0.84, 1.45)			-3.37 (-7.23, 0.48)		
T3	1.14 (0.79, 1.63)			0.91 (0.53, 1.57)			0.99 (0.75, 1.30)			-0.30 (-4.21, 3.60)		

HR = hazard ratio; FEV_1%= forced expiratory volume in 1 second expressed in percent predicted; CI = confidence interval; ∑LMW = molar sum of Low Molecular Weight phthalates (MEP, MnBP, MiBP); ∑HMW = molar sum of High Molecular Weight phthalates (MCPP, MBzP, MCNP, MCOP, MEHHP, MEOHP, MECPP, MEHP); ∑DEHP = molar sum of di(2-ethylhexyl) phthalate metabolites (MEHHP, MEOHP, MECPP, MEHP). Parent compounds and associated metabolites are detailed in Table S1 (Supplemental material)

[a] Models adjusted for centre, residence area, parental history of allergies, maternal ethnicity, maximal parental education level, maternal or passive smoking during pregnancy, postnatal passive smoking, older siblings, day-care. Missing values in covariates were imputed using the MICE multiple imputation method (100 imputations were performed) [b] additionally adjusted for child's height and age.

[c] Standardized for urine sampling conditions (creatinine level, day and hour of sampling, gestational age, storage duration at room temperature and year of analysis), as detailed in Mortamais et al. (2012).

[d] Estimates for 1 unit increase in ln-transformed standardized concentration.

[e] p-values of heterogeneity test.

Italicized p-values are p-values of monotonic trend test.

Table S10. Adjusted associations between pregnancy phenols standardized concentrations and respiratory outcomes (n=562) and FEV_1% (n=217) in full-term boys.

	Wheezing (until age 5y)[a] N = 562			Asthma diagnosis (until age 5y)[a] N = 562			Bronchiolitis/Bronchitis (until age 3y)[a] N = 562			FEV_1%[b] N = 217		
Phenol[c]	HR (95% CI)	p_{het}[e]	*p*-value	HR (95% CI)	p_{het}[e]	*p*-value	HR (95% CI)	p_{het}[e]	*p*-value	beta (95% CI)	p_{het}[e]	*p*-value
2,4-Dichlorophenol												
Continuous[d]	1.04 (0.93, 1.17)		0.45	1.07 (0.90, 1.27)		0.45	0.98 (0.89, 1.08)		0.63	0.62 (-0.69, 1.93)		0.35
T1	1.00	0.38	*0.97*	1.00	0.28	*0.91*	1.00	0.39	*0.42*	0.00	0.62	*0.95*
T2	1.24 (0.90, 1.70)			1.45 (0.91, 2.31)			1.12 (0.87, 1.44)			1.83 (-1.91, 5.57)		
T3	1.06 (0.77, 1.46)			1.14 (0.70, 1.86)			0.94 (0.73, 1.21)			0.67 (-2.93, 4.26)		
2,5-Dichlorophenol												
Continuous[d]	1.07 (0.99, 1.16)		0.08	1.07 (0.95, 1.20)		0.25	1.00 (0.94, 1.07)		1.00	0.27 (-0.62, 1.16)		0.55
T1	1.00	0.01	*0.19*	1.00	0.20	*0.20*	1.00	0.65	*0.57*	0.00	0.93	*0.80*
T2	1.68 (1.21, 2.33)			1.45 (0.89, 2.35)			0.92 (0.71, 1.19)			-0.44 (-4.13, 3.24)		
T3	1.49 (1.07, 2.07)			1.50 (0.93, 2.43)			1.03 (0.80, 1.33)			0.25 (-3.36, 3.86)		
∑Dichlorophenols												
Continuous[d]	1.07 (0.99, 1.16)		0.10	1.07 (0.95, 1.21)		0.27	1.00 (0.93, 1.07)		0.97	0.32 (-0.62, 1.26)		0.50
T1	1.00	0.06	*0.18*	1.00	0.21	*0.19*	1.00	0.71	*0.42*	0.00	0.87	*0.89*
T2	1.44 (1.04, 1.99)			1.42 (0.87, 2.30)			1.00 (0.77, 1.29)			-0.89 (-4.61, 2.82)		
T3	1.40 (1.01, 1.93)			1.51 (0.93, 2.44)			1.10 (0.85, 1.41)			-0.08 (-3.68, 3.53)		
Bisphenol A												
Continuous[d]	0.98 (0.83, 1.16)		0.83	1.19 (0.94, 1.51)		0.15	1.14 (0.99, 1.31)		0.06	-0.66 (-2.53, 1.20)		0.48
T1	1.00	1.00	*0.98*	1.00	0.45	*0.21*	1.00	0.39	*0.18*	0.00	0.59	*0.63*
T2	1.01 (0.74, 1.38)			1.07 (0.65, 1.76)			1.10 (0.86, 1.42)			-1.85 (-5.45, 1.76)		
T3	1.01 (0.73, 1.39)			1.32 (0.83, 2.12)			1.20 (0.93, 1.54)			-1.28 (-4.98, 2.42)		
Benzophenone-3												
Continuous[d]	0.92 (0.85, 1.00)		0.06	0.94 (0.83, 1.06)		0.30	1.00 (0.93, 1.06)		0.90	-0.32 (-1.29, 0.65)		0.69
T1	1.00	0.03	*0.01*	1.00	0.11	*0.07*	1.00	0.72	*0.79*	0.00	0.89	*0.75*
T2	0.88 (0.65, 1.20)			0.76 (0.49, 1.20)			0.90 (0.70, 1.16)			-0.71 (-4.33, 2.91)		
T3	0.65 (0.47, 0.90)			0.59 (0.36, 0.97)			0.93 (0.72, 1.20)			-0.78 (-4.34, 2.78)		
Triclosan												
Continuous[d]	0.98 (0.94, 1.04)		0.62	0.98 (0.91, 1.06)		0.63	1.00 (0.96, 1.04)		0.94	0.10 (-0.48, 0.69)		0.73
T1	1.00	0.88	*0.63*	1.00	0.88	*0.75*	1.00	0.98	*0.95*	0.00	0.91	*0.82*
T2	0.97 (0.71, 1.32)			1.09 (0.69, 1.72)			1.02 (0.80, 1.31)			0.52 (-3.04, 4.08)		
T3	0.92 (0.68, 1.26)			0.97 (0.60, 1.55)			1.00 (0.78, 1.29)			-0.25 (-3.88, 3.38)		
Methyl-paraben												
Continuous[d]	0.93 (0.85, 1.01)		0.07	1.01 (0.89, 1.14)		0.93	0.95 (0.89, 1.02)		0.14	-0.42 (-1.29, 0.44)		0.33
T1	1.00	0.08	*0.14*	1.00	0.96	*0.99*	1.00	0.06	*0.03*	0.00	0.26	*0.22*
T2	0.74 (0.54, 1.00)			0.94 (0.59, 1.49)			0.85 (0.66, 1.08)			1.57 (-2.08, 5.22)		
T3	0.74 (0.54, 1.01)			0.99 (0.61, 1.59)			0.73 (0.57, 0.95)			-1.51 (-5.03, 2.01)		
Ethyl-paraben												
Continuous[d]	1.01 (0.95, 1.07)		0.86	1.10 (1.00, 1.22)		0.04	0.99 (0.95, 1.04)		0.80	-0.52 (-1.19, 0.15)		0.13
T1	1.00	0.65	*0.83*	1.00	0.05	*0.10*	1.00	0.01	*0.29*	0.00	0.53	*0.31*
T2	1.16 (0.85, 1.59)			1.67 (1.02, 2.74)			1.38 (1.07, 1.78)			-1.05 (-4.65, 2.55)		
T3	1.10 (0.79, 1.51)			1.79 (1.08, 2.98)			1.01 (0.78, 1.31)			-2.05 (-5.64, 1.54)		
Propyl-paraben												
Continuous[d]	0.95 (0.89, 1.02)		0.18	0.99 (0.89, 1.09)		0.79	0.97 (0.92, 1.03)		0.29	-0.18 (-0.91, 0.56)		0.63
T1	1.00	0.24	*0.31*	1.00	0.72	*0.72*	1.00	0.37	*0.22*	0.00	0.83	*0.55*
T2	0.79 (0.58, 1.08)			0.83 (0.52, 1.32)			0.90 (0.70, 1.15)			0.05 (-3.56, 3.66)		
T3	0.80 (0.58, 1.09)			0.87 (0.54, 1.40)			0.84 (0.65, 1.08)			-0.95 (-4.53, 2.63)		
Butyl-paraben												
Continuous[d]	0.98 (0.92, 1.05)		0.60	1.00 (0.90, 1.10)		0.95	0.99 (0.94, 1.04)		0.73	-0.36 (-1.07, 0.35)		0.32
T1	1.00	0.12	*0.13*	1.00	0.58	*0.78*	1.00	0.02	0.03	0.00	0.47	*0.53*
T2	1.23 (0.90, 1.67)			1.28 (0.80, 2.06)			1.22 (0.95, 1.57)			-1.94 (-5.50, 1.62)		
T3	0.88 (0.63, 1.23)			1.20 (0.72, 1.99)			0.85 (0.65, 1.10)			-1.97 (-5.60, 1.66)		
∑Parabens												
Continuous[d]	0.92 (0.85, 1.00)		0.06	1.01 (0.89, 1.14)		0.93	0.95 (0.89, 1.02)		0.16	-0.42 (-1.28, 0.45)		0.35
T1	1.00	0.07	*0.08*	1.00	0.90	*0.73*	1.00	0.11	*0.19*	0.00	0.19	*0.26*
T2	0.76 (0.56, 1.03)			1.05 (0.66, 1.65)			0.79 (0.62, 1.02)			2.15 (-1.47, 5.78)		
T3	0.72 (0.52, 0.98)			0.94 (0.58, 1.52)			0.80 (0.62, 1.03)			-1.20 (-4.73, 2.32)		

HR = hazard ratio; FEV_1%= forced expiratory volume in 1 second expressed in percent predicted; CI = confidence interval; ∑Dichlorophenols = molar sum of 2-Dichlorophenols (2,4-, 2,5-dichlorophenols); ∑Parabens = molar sum of parabens (Methyl-, Ethyl-, Propyl-, Butyl-parabens).

[a] Models adjusted for centre, residence area, parental history of asthma or allergies, maternal ethnicity, maximal parental education level, maternal or passive smoking during pregnancy, postnatal passive smoking, older siblings, day-care. Missing values in covariates were imputed using the MICE multiple imputation method (100 imputations were performed) [b] additionally adjusted for child's height and age.

[c] Standardized for urine sampling conditions (creatinine level, day and hour of sampling, gestational age, storage duration at room temperature and year of analysis), as detailed in Mortamais et al. (2012).

[d] Estimates for 1 unit increase in ln-transformed standardized concentration.

[e] p-values of heterogeneity test.

Italicized p-values are p-values of monotonic trend test.

Table S11. Adjusted associations between pregnancy phthalate metabolites standardized concentrations and respiratory outcomes (n=562) and FEV_1% (n=217) in full-term boys.

	Wheezing (until age 5y)[a]			Asthma diagnosis (until age 5y)[a]			Bronchiolitis/Bronchitis (until age 3y)[a]			FEV_1%[b]		
	N = 562			N = 562			N = 562			N = 217		
Phthalate[c]	HR (95% CI)	p_{het}[e]	*p*-value	HR (95% CI)	p_{het}[e]	*p*-value	HR (95% CI)	p_{het}[e]	*p*-value	beta (95% CI)	p_{het}[e]	*p*-value
∑LMW												
Continuous[d]	0.94 (0.81, 1.10)		0.46	0.99 (0.79, 1.24)		0.93	1.00 (0.88, 1.13)		0.96	-0.18 (-1.98, 1.63)		0.85
T1	1.00	0.75	*0.58*	1.00	0.67	*0.92*	1.00	0.84	*0.72*	0.00	0.26	*0.10*
T2	1.06 (0.77, 1.44)			1.21 (0.77, 1.90)			1.07 (0.83, 1.38)			-0.65 (-4.22, 2.93)		
T3	0.93 (0.68, 1.29)			1.02 (0.63, 1.66)			1.06 (0.82, 1.37)			-2.82 (-6.35, 0.71)		
MEP												
Continuous[d]	0.97 (0.86, 1.10)		0.64	1.10 (0.92, 1.31)		0.29	1.02 (0.93, 1.12)		0.67	-0.01 (-1.46, 1.44)		0.98
T1	1.00	1.00	*0.94*	1.00	0.51	*0.33*	1.00	0.60	*0.50*	0.00	0.99	*0.95*
T2	1.01 (0.74, 1.38)			0.91 (0.56, 1.48)			1.12 (0.87, 1.44)			0.16 (-3.40, 3.71)		
T3	1.01 (0.74, 1.39)			1.19 (0.75, 1.89)			1.12 (0.86, 1.44)			-0.08 (-3.69, 3.54)		
MnBP												
Continuous[d]	1.03 (0.91, 1.16)		0.62	0.93 (0.77, 1.12)		0.43	0.97 (0.88, 1.07)		0.54	-0.27 (-1.66, 1.12)		0.70
T1	1.00	0.61	*0.42*	1.00	0.56	*0.31*	1.00	0.51	*0.51*	0.00	0.95	*0.82*
T2	0.95 (0.69, 1.30)			0.87 (0.55, 1.37)			0.87 (0.68, 1.12)			0.27 (-3.33, 3.87)		
T3	1.10 (0.81, 1.51)			0.77 (0.48, 1.24)			0.89 (0.69, 1.15)			-0.33 (-4.00, 3.34)		
MiBP												
Continuous[d]	0.97 (0.83, 1.13)		0.67	1.00 (0.79, 1.27)		0.99	1.01 (0.89, 1.15)		0.85	-1.30 (-3.02, 0.41)		0.14
T1	1.00	0.75	*0.96*	1.00	0.69	*0.53*	1.00	0.93	*0.85*	0.00	0.09	*0.03*
T2	0.88 (0.64, 1.22)			1.09 (0.69, 1.73)			1.03 (0.80, 1.33)			-0.81 (-4.42, 2.81)		
T3	0.96 (0.70, 1.32)			0.88 (0.54, 1.44)			0.99 (0.76, 1.27)			-3.77 (-7.32, -0.23)		
∑HMW												
Continuous[d]	1.07 (0.91, 1.26)		0.43	1.09 (0.84, 1.40)		0.53	0.92 (0.80, 1.05)		0.21	-1.03 (-2.90, 0.84)		0.28
T1	1.00	0.30	*0.99*	1.00	0.91	*0.90*	1.00	0.60	*0.38*	0.00	0.24	*0.43*
T2	1.27 (0.92, 1.73)			1.11 (0.69, 1.78)			0.91 (0.71, 1.17)			-2.99 (-6.51, 0.54)		
T3	1.06 (0.77, 1.46)			1.05 (0.66, 1.69)			0.88 (0.68, 1.14)			-2.04 (-5.62, 1.54)		
MCPP												
Continuous[d]	1.04 (0.89, 1.21)		0.63	0.88 (0.69, 1.13)		0.32	0.90 (0.79, 1.03)		0.12	-0.50 (-2.40, 1.40)		0.60
T1	1.00	0.72	*0.46*	1.00	0.58	*0.30*	1.00	0.46	*0.30*	0.00	0.44	*0.89*
T2	1.09 (0.79, 1.49)			0.97 (0.61, 1.53)			1.05 (0.82, 1.34)			-2.21 (-5.76, 1.34)		
T3	1.14 (0.83, 1.57)			0.79 (0.48, 1.28)			0.90 (0.69, 1.16)			-0.57 (-4.14, 2.99)		
MBzP												
Continuous[d]	0.99 (0.87, 1.13)		0.88	1.13 (0.94, 1.38)		0.20	0.96 (0.87, 1.07)		0.51	-0.11 (-1.68, 1.45)		0.89
T1	1.00	0.43	*0.43*	1.00	0.78	*0.92*	1.00	0.34	*0.14*	0.00	0.13	*0.30*
T2	1.13 (0.83, 1.54)			1.19 (0.74, 1.92)			0.96 (0.74, 1.23)			-3.58 (-7.19, 0.03)		
T3	0.92 (0.67, 1.27)			1.07 (0.67, 1.73)			0.83 (0.65, 1.07)			-2.70 (-6.29, 0.89)		
MCNP												
Continuous[d]	1.10 (0.98, 1.25)		0.11	1.13 (0.95, 1.34)		0.18	1.00 (0.90, 1.10)		0.99	0.49 (-0.98, 1.95)		0.51
T1	1.00	0.22	*0.17*	1.00	0.29	*0.24*	1.00	0.55	*0.66*	0.00	0.94	*0.89*
T2	1.25 (0.91, 1.73)			1.39 (0.85, 2.29)			1.15 (0.89, 1.48)			-0.60 (-4.15, 2.96)		
T3	1.30 (0.95, 1.78)			1.43 (0.88, 2.30)			1.09 (0.85, 1.41)			-0.43 (-3.99, 3.13)		
MCOP												
Continuous[d]	1.04 (0.89, 1.21)		0.63	1.03 (0.82, 1.28)		0.83	1.11 (0.99, 1.25)		0.08	-1.31 (-2.95, 0.34)		0.12
T1	1.00	0.79	*0.57*	1.00	0.45	*0.90*	1.00	0.89	*0.95*	0.00	0.45	*0.21*
T2	0.92 (0.67, 1.26)			0.75 (0.46, 1.21)			1.06 (0.83, 1.37)			-0.59 (-4.28, 3.09)		
T3	0.90 (0.66, 1.23)			0.97 (0.61, 1.52)			1.02 (0.79, 1.32)			-2.21 (-5.75, 1.34)		
MEHHP												
Continuous[d]	1.06 (0.92, 1.23)		0.40	1.01 (0.80, 1.26)		0.96	0.96 (0.86, 1.08)		0.54	-0.86 (-2.45, 0.73)		0.29
T1	1.00	0.56	*0.60*	1.00	0.32	*0.70*	1.00	0.81	*0.67*	0.00	0.26	*0.33*
T2	1.19 (0.86, 1.64)			1.34 (0.84, 2.15)			1.04 (0.81, 1.34)			-2.88 (-6.39, 0.64)		
T3	1.12 (0.82, 1.54)			0.98 (0.60, 1.60)			0.96 (0.74, 1.23)			-1.93 (-5.57, 1.72)		
MEOHP												
Continuous[d]	1.07 (0.92, 1.24)		0.37	1.01 (0.80, 1.27)		0.95	0.94 (0.84, 1.06)		0.34	-1.26 (-2.89, 0.37)		0.13
T1	1.00	0.36	*0.67*	1.00	0.88	*0.68*	1.00	0.56	*0.53*	0.00	0.08	*0.08*
T2	1.26 (0.92, 1.73)			1.03 (0.65, 1.64)			1.08 (0.84, 1.39)			-3.58 (-7.13, -0.04)		
T3	1.11 (0.81, 1.54)			0.92 (0.57, 1.47)			0.94 (0.73, 1.21)			-3.35 (-6.89, 0.20)		
MECPP												
Continuous[d]	1.06 (0.91, 1.24)		0.44	1.08 (0.86, 1.38)		0.50	0.93 (0.82, 1.06)		0.28	-1.31 (-3.06, 0.44)		0.14
T1	1.00	0.14	*0.85*	1.00	0.44	*0.94*	1.00	0.92	*0.73*	0.00	0.12	*0.10*
T2	1.36 (0.99, 1.85)			1.32 (0.83, 2.11)			1.01 (0.79, 1.30)			-3.12 (-6.67, 0.45)		
T3	1.11 (0.80, 1.53)			1.05 (0.65, 1.72)			0.96 (0.75, 1.24)			-3.35 (-6.91, 0.21)		
MEHP												
Continuous[d]	1.02 (0.90, 1.15)		0.76	0.98 (0.81, 1.18)		0.84	0.93 (0.84, 1.03)		0.16	-0.83 (-2.18, 0.52)		0.23
T1	1.00	0.71	*0.41*	1.00	0.77	*0.48*	1.00	0.24	*0.65*	0.00	0.31	*0.16*
T2	1.02 (0.74, 1.40)			1.01 (0.63, 1.63)			0.81 (0.63, 1.04)			0.04 (-3.51, 3.58)		
T3	1.13 (0.83, 1.54)			1.17 (0.73, 1.85)			0.91 (0.71, 1.16)			-2.36 (-5.92, 1.20)		
∑DEHP												
Continuous[d]	1.06 (0.91, 1.24)		0.46	1.03 (0.81, 1.31)		0.81	0.94 (0.82, 1.06)		0.30	-1.18 (-2.88, 0.52)		0.17
T1	1.00	0.23	*0.98*	1.00	0.60	*0.70*	1.00	0.84	*0.59*	0.00	0.16	*0.32*
T2	1.30 (0.95, 1.78)			1.19 (0.75, 1.91)			1.01 (0.79, 1.30)			-3.41 (-6.94, 0.12)		
T3	1.06 (0.77, 1.47)			0.96 (0.59, 1.55)			0.94 (0.73, 1.21)			-1.99 (-5.56, 1.58)		

HR = hazard ratio; FEV_1%= forced expiratory volume in 1 second expressed in percent predicted; CI = confidence interval; ∑LMW = molar sum of Low Molecular Weight phthalates (MEP, MnBP, MiBP); ∑HMW = molar sum of High Molecular Weight phthalates (MCPP, MBzP, MCNP, MCOP, MEHHP, MEOHP, MECPP, MEHP); ∑DEHP = molar sum of di(2-ethylhexyl) phthalate metabolites (MEHHP, MEOHP, MECPP, MEHP). Parent compounds and associated metabolites are detailed in Table S1 (Supplemental material)

[a] Models adjusted for centre, residence area, parental history of asthma or allergies, maternal ethnicity, maximal parental education level, maternal or passive smoking during pregnancy, postnatal passive smoking, older siblings, day-care. Missing values in covariates were imputed using the MICE multiple imputation method (100 imputations were performed) [b] additionally adjusted for child's height and age.

[c] Standardized for urine sampling conditions (creatinine level, day and hour of sampling, gestational age, storage duration at room temperature and year of analysis), as detailed in Mortamais et al. (2012).

[d] Estimates for 1 unit increase in ln-transformed standardized concentration.

[e] p-values of heterogeneity test.

Italicized p-values are p-values of monotonic trend test.

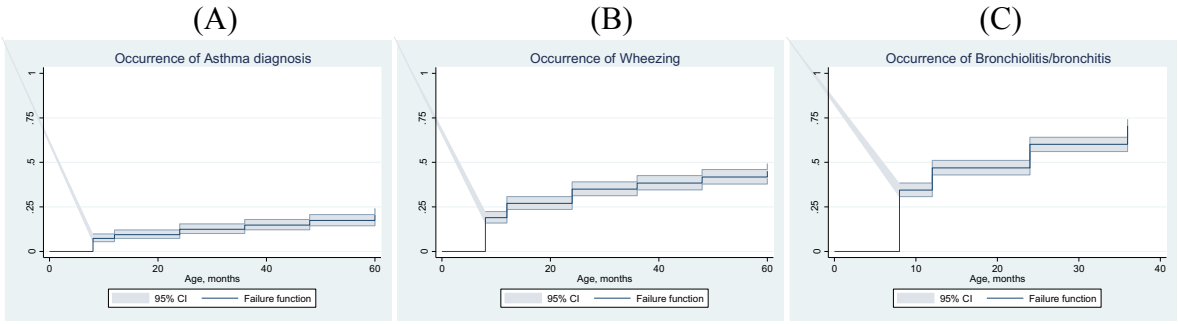

Figure S1. Occurrence of doctor-diagnosed asthma (A), wheezing (B) and bronchiolitis/bronchitis (C), Kaplan-Meier estimates.