

Appendix

Exposure to select phthalates and phenols through use of personal care products among Californian adults and their children.

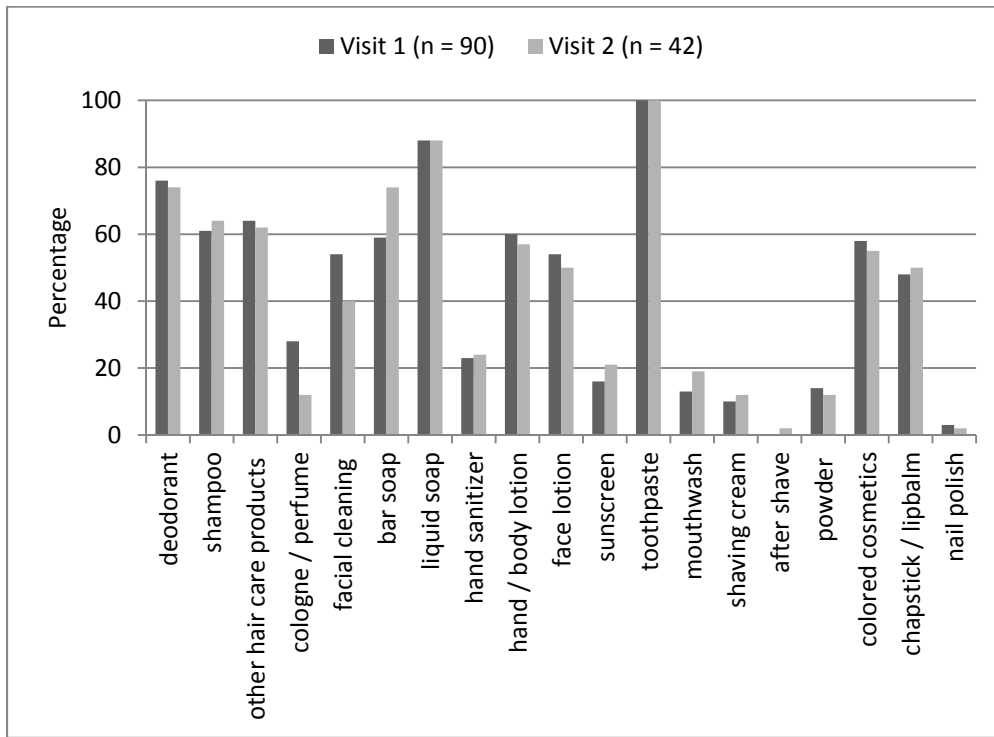
Claire Philippiat, Deborah Bennett, Antonia M. Calafat, Irva Hertz-Picciotto

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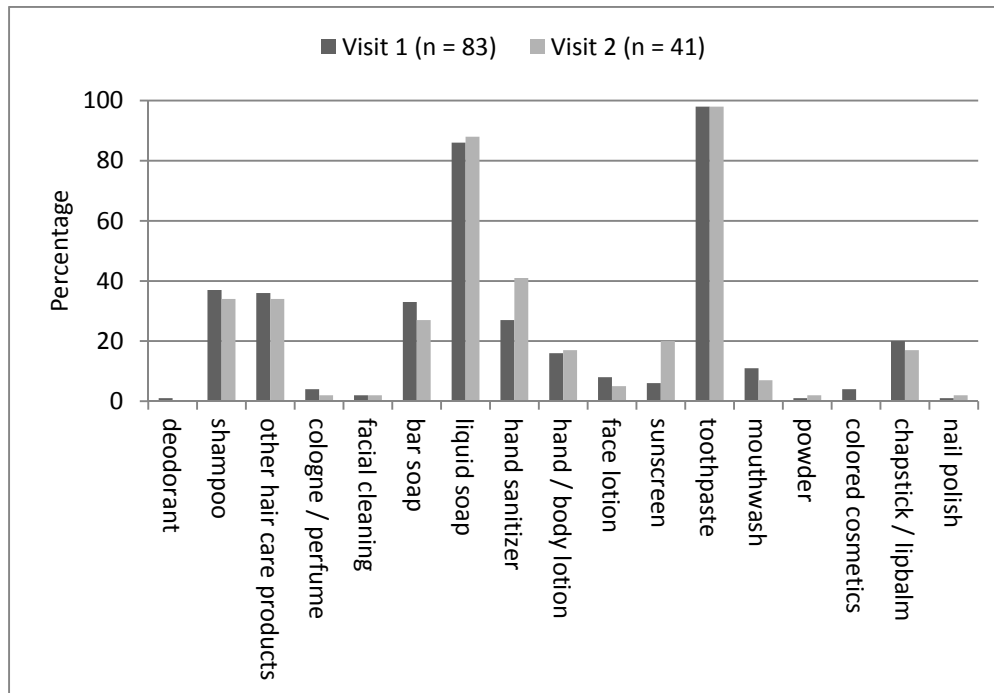
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Figure A1: Percentage of adults (A) and children (B) reporting using specific personal care products in the 24 hours preceding urine collection (SUPERB study, 2007-2009)

A) Adults



B) Children



Other hair care products includes: hair conditioner, hair gel, hair spray, moose, hair bleach, relaxer, perm
 Colored cosmetics includes: foundation, blush, eye shadow, eye liner, mascara.

Table A1: Urinary concentrations of phenols, phthalate metabolites and creatinine in adults and children (SUPERB study, 2007-2009)

	Adults, 1 st visit							Adults, 2 nd visit					Children, 1 st visit					Children, 2 nd visit							
	LOD	n	% > LOD	% with MV ^a	Percentiles			n	% > LOD	% with MV ^a	Percentiles			n	% > LOD	% with MV ^a	Percentiles			n	% > LOD	% with MV ^a	Percentiles		
					5	50	95				5	50	95				5	50	95				5	50	95
Phenols (µg/L)																									
BP3	0.4	90	100	100	4.9	128	3740	42	100	100	3.1	151	4430	83	100	100	7.3	55	4970	41	100	100	2.4	46.2	2270
TCS	2.3	90	66	77	<LOD	11	354	42	79	86	<LOD	8.0	278	83	67	82	<LOD	6.6	153	41	80	88	<LOD	9.7	137
MP	1.0	90	100	100	8.2	97	1630	42	100	100	9.3	82	466	83	100	100	3.7	36	584	41	100	100	4.2	44.5	760
PP	0.2	90	100	100	0.4	16	381	42	98	98	0.2	6.95	198	83	94	99	0.2	3.2	78	41	93	100	0.2	4.4	69.5
BP	0.2	90	69	88	<LOD	0.5	23.1	42	57	76	<LOD	0.4	38	83	53	83	<LOD	<LOD	10	41	44	73	<LOD	<LOD	4.1
Phthalates (µg/L)																									
MEP	0.8	90	100	100	6.9	33.8	508	42	100	100	4.3	38	193	83	100	100	5.2	31	187	41	100	100	4.7	19	104
MBP	0.6	90	100	100	3.9	23.1	75	42	98	98	1.6	23	96	83	100	100	4.8	32	170	41	100	100	5.4	24	116
MiBP	0.3	90	100	100	2.2	11.1	38	42	98	100	1.4	12.6	40	83	100	100	3.3	14	78	41	100	100	3	12	59
Creatinine (mg/dL)																									
	3.5	90	100	100	26	114	266	42	100	100	21.1	128	230	83	100	100	18	73.6	147	41	100	100	24	60	138

Abbreviation: BP: butyl paraben, BP3: benzophenone-3, LOD: limit of detection, MBP: mono-n-butyl phthalate, MEP: monoethyl phthalate, MiBP: mono-isobutyl phthalate, MP: methyl paraben, MV: machine values, PP: propyl paraben, TCS: Triclosan

^a Percentage of samples with an instrument reading value different to the null

Table A2: Spearman correlation coefficients between phenol and phthalate metabolite concentrations (creatinine corrected) measured in urine samples collected at the first study visit

	BP3	TCS	MP	PP	BP	MEP	MBP
Adults (n = 90, visit 1)							
TCS	0.15						
MP	0.13	0.03					
PP	0.17	0.07	0.84				
BP	0.05	-0.01	0.48	0.42			
MEP	0.09	0.09	0.37	0.23	0.25		
MBP	0.11	0.13	0.04	0.02	0.00	0.04	
MiBP	0.02	0.10	0.00	0.07	0.13	0.15	0.48
Children (n = 83, visit 1)							
TCS	0.07						
MP	0.09	0.05					
PP	0.39	0.12	0.66				
BP	0.37	-0.03	0.35	0.48			
MEP	0.08	-0.04	0.04	0.22	0.06		
MBP	0.14	-0.17	0.09	0.30	0.06	0.07	
MiBP	0.22	0.08	0.10	0.32	0.17	0.23	0.63

Abbreviations: BP: butyl paraben, BP3: benzophenone-3, MBP: mono-n-butyl phthalate, MEP: monoethyl phthalate, MiBP: mono-isobutyl phthalate, MP: methyl paraben, PP: propylparaben, TCS: triclosan

Table A3: Spearman correlation coefficients for ln-transformed biomarker concentrations^a, comparing adults and their children (SUPERB study, 2007-2009, n = 81^b adult-child pairs)

Compounds (µg/L)	Crude concentrations	Concentrations standardized for creatinine^c
Phenols		
Benzophenone-3	0.65	0.65
Triclosan	0.47	0.50
Methyl paraben	0.29	0.33
Propyl paraben	0.34	0.35
Butyl paraben	0.52	0.38
Phthalates		
Mono-ethyl phthalate	0.28	0.31
Mono-n-butyl phthalate	0.30	0.41
Mono-isobutyl phthalate	0.22	0.19

^a Urinary concentrations measured in sample collected at the first study visit.

^b Two adults-child pairs were excluded from this analysis because the parent and the child collected their urine sample several days apart.

^c Biomarker concentrations were divided by urinary creatinine concentrations.

Table A4: Spearman correlation and Cohen's kappa coefficients for biomarker concentrations^a comparing measurement at the first and second study visits approximately one year apart (SUPERB study, 2007-2009)

Compounds ($\mu\text{g/g creat}$)	Adults, n = 42		Children, n = 36 ^b	
	ρ	Kappa	ρ	Kappa
Phenols				
Benzophenone-3	0.60	0.36	0.42	0.13
Triclosan	0.71	0.50	0.47	0.17
Methyl paraben	0.53	0.21	0.50	0.21
Propyl paraben	0.64	0.32	0.61	0.33
Butyl paraben	0.66	0.36	0.18	0.00
Phthalates				
Mono-ethyl phthalate	0.44	0.32	0.32	0.08
Mono-n-butyl phthalate	0.25	0.04	0.39	0.17
Mono-isobutyl phthalate	0.39	0.18	0.36	0.25

^a Biomarker concentrations were divided by urinary creatinine concentrations.

^b Among the 41 children with an urine sample at the 2nd study visit, 5 did not have an urine sample at the 1st study visit leading to 36 children with an urine sample at both the 1st and 2nd study visits.

Abbreviations: Kappa: Cohen's kappa coefficient, ρ : Spearman correlation coefficient.

Table A5: Comparisons of median concentrations (in µg/L) measured in the SUPERB study and NHANES between 2007 and 2009 (Centers for Disease Control and Prevention, 2014)

	Adults			Children		
	Superb study, 2007-2009 (1st visit)	Nhanes 2007-2008 ^a	Nhanes 2008-2009 ^a	Superb study, 2007-2009 (1st visit)	Nhanes 2007-2008 ^b	Nhanes 2008-2009 ^b
Phenols						
Benzophenone-3	128	13.7	16.5	55	17.2	14.6
Triclosan	11	12.3	11.1	6.60	9.8	9.9
Methyl paraben	97	64	59.1	36	30.1	26.5
Propyl paraben	16	8.4	7.5	3.20	3.5	2.7
Butyl paraben	0.50	< LOD	< LOD	< LOD	< LOD	< LOD
Phthalates						
Mono-ethyl phthalate	33.75	84.7	60.5	31	45.2	33
Mono-n-butyl phthalate	23.10	18.6	14.5	32	28.7	23.3
Mono-isobutyl phthalate	11.05	7.5	7.55	14	11.4	10.9

^a Age group: 20 years and older

^b Age group: 6 to 11 years

Reference

Centers for Disease Control and Prevention. Fourth National Report on Human Exposure to Environmental Chemicals Updated Tables, August, 2014. Available: http://www.cdc.gov/exposurereport/pdf/fourthreport_updatedtables_aug2014.pdf. [accessed November, 8th 2014].