Supplementary Information

Exposure to Phthalate and Organophosphate esters via Indoor dust and PM10 is a Cause of Concern for the Exposed Saudi Population

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This supplementary information consists of four tables.

Table S1. Mean levels (μg/g of dust) of selected OPEs and phthalates in SRM 2585.

Compounds	van den Eede et al. [1]	Brandsma et al. [2]	Luongo et al. [3]	Mercier et al. [4]	Bergh et al. [5]	This study
TCEP	0.70	0.80	1.1			0.80
TCPP	0.90	0.80	1.3			1.2
TDCPP	3.2	2.5	2.6			2.7
TPhP	1.2	0.90	1.5			1.5
DMP			0.60	2.5	1.0	2.1
DEP			5.2	8.2	6.7	8.5
DBP			38	33	31	37
DEHA						0.70
DZBP			85	99	93	111
DEHP			538	552	570	612

Table S2. Concentrations (ng/m^3) of analyzed OPEs and phthalates in indoor air reported from different countries.

Countries	Microenvironment	n	TCEP	TCPP	TDCPP	TPhP	DMP	DEP	DBP	DEHA	DZBP	DEHP	Reference
Saudi Arabia	Kitchen	15	6	43	<LOQ	15	<LOQ	9	191	14	1	610	This study
	Hotel	10	4	42	<LOQ	7	<LOQ	62	255	6	1	230	
	Living room	20	7	38	<LOQ	9	<LOQ	11	250	10	1	520	
	Office	10	<LOQ	12	<LOQ	3	<LOQ	28	173	4	2	109	
Sweden	Daycare	11	25	8.4	<LOQ	<LOQ	4.7	870	600	nd	21	240	Bergh et al. [6]
	Home	10	4.8	5.6	<LOQ	<LOQ	15	1300	850	nd	21	200	
	Work	10	10	100	28	<LOQ	4.4	620	550	nd	15	100	
Germany	Day care	63	<2	2.7	<LOQ	nd	nd	nd	nd	nd	nd	nd	Fromme et al. [7]
Germany	Home	7	<0.2	4.15	<0.1	<0.16	nd	nd	nd	nd	nd	nd	Zhou et al. [8]
	Office	11	0.56	33.9	0.42	<0.16	nd	nd	nd	nd	nd	nd	
	Day care	6	1.7	6.49	3	<0.16	nd	nd	nd	nd	nd	nd	
	School	12	<0.2	10	<0.1	<0.16	nd	nd	nd	nd	nd	nd	
	Store	9	<0.2	20.6	<0.1	<0.16	nd	nd	nd	nd	nd	nd	
Norway	Home	48	2.25	42.3	0.084	nd	nd	nd	nd	nd	nd	nd	Cequier et al. [9]
Japan	Home	6	13-65	nd	<LOQ-18	<LOQ-78	<LOQ-210	10-440	100-4000	3-420	5.0-72	31-2400	Takeuchi et al. [10]
China	Office	90	1-13.5	0.8-81	0.63	0.3-10	nd	nd	nd	nd	nd	nd	Yang et al. [11]
Finland	Office	4	8	20	<40	<6	nd	nd	nd	nd	nd	nd	Makinen et al. [12]
	School	3	100	160	<40	40	nd	nd	nd	nd	nd	nd	
	Store	7	20	<10	<40	9	nd	nd	nd	nd	nd	nd	
Switzerland	Office	4	26.5	nd-130	nd	nd	nd	nd	nd	nd	nd	nd	Hartmann et al. [13]
	Store	2	9.1	51.1	nd	nd	nd	nd	nd	nd	nd	nd	
USA	Multi-indoor settings	54	2.24	17.3	1.51	1.11	nd	nd	nd	nd	nd	nd	Kim et al. [14]

Table S3. Concentrations and range (ng/g) of dust OPEs in indoor dust reported from different countries.

Countries	n	Year	TCEP	TCPP	TPhP	TDCPP	References
Saudi Arabia	House, n=20	2019	280 <LOQ–25450	1280 26–17250	795 610–9000	1525 <LOQ–	This study
	AC filter, n=15		14475 <LOQ-58190	1750 670-5830	920 790-2520	5950 630-19660	
	House, n=20		<LOQ <LOQ-3370	2650 150-7820	835 670-1540	660 400-5630	
Saudi Arabia	Mosque, n=30	2017	420 270-34700	2055 1570-4820	1135 675-4960	2490 970-6945	Ali et al. [15]
Egypt	20	2014	22 <8–132	28 <10–123	67 8–289	72 <9–557	Abdallah and Covaci [16]
Kuwait	15	2011	710 275–1800	1460 120–7065	430 44–6890	360 60–1555	Ali et al. [17]
Pakistan	15	2011	15 <10–175	<20 <20–85	175 <2–330	<5 <5–255	Ali et al. [17]
Japan	40	2006	7500 <1300–	18700 5400–	5400 <1600–	4000 <1200–	Kanazawa et al. [18]
USA	16	2011	2700 330–110000	2200 490–	2800 790–36000	2100 920–44000	Dodson et al.[19]
New Zealand	34	2010	110 20–7650	350 20–7620	565 20–7500	230 20–16550	Ali et al.[20]
Belgium	15	2010	590 <80–5460	2940 580–24400	1970 150–34200	760 <80–56200	Van den Eede et al. [1]
Sweden	10	2010	2100 <80–33000	1600 700–11000	1200 100–4200	10000 2200–27000	Bergh et al. [6]
Romania	47	2010	100 <20–1160	860 <20–16400	500 <20–22600	60 <20–460	Dirtu et al. [21]
Spain	8	2007	510 250–9800	3800 350–10300	1850 290–9500	125 <LOQ–1100	García et al. [22]
Germany	6	2006	200 140–280	740 370–960	380 180–1300	<80 <80–110	Brommer et al. [23]

Table S4. Concentrations (ng/g) of dust phthalates in indoor dust reported from different countries.

Country	n	DMP	DEP	DBP	BzBP	DEHP	Reference
Saudi Arabia	20	0.29	1.02	18.85	0.46	573	This study floor dust
	10	0.41	4.15	41.45	0.75	745	Hotel dust
	20	0.34	1.14	26.70	0.93	672	AC filter floor
Saudi Arabia	15	0.6	1.4	33	0.8	1022	Albar et al. [24]
Kuwait	15	0.1	2.7	2	1	240	
Sweden	62	0.47	14	103	16	449	Luongo et al. [3]
Sweden	346	–	–	150	135	770	Bornehag et al. [25]
Denmark	497	–	1.7	15	3.7	210	Langer et al. [26]
Germany	30	1.5	6.1	47	30	703	Fromme et al. [7]
Germany	30	–	–	87	15	604	Abb et al. [27]
France	7	0.35	4.9	9.1	6.1	462	Mercier et al. [4]
Kuwait	21	0.02	1.8	45	7.9	2256	Gevao et al. [28]
Bulgaria	177	280	340	9930	340	1050	Kolarik et al. [29]
China	215	0.1	0.2	24	1.6	183	Zhang et al. [30]
China	75	0.2	0.4	20	0.2	228	Guo and Kannan [31]
USA	33	0.08	2	13	21	304	
USA	120	–	5	20	45	340	Rudel et al. [32]
France	1	–	44	22	9.3	185	Santillo et al. [33]
Spain	1	0.4	9.5	120	142	195	
UK	29	0.12	12	50	57	192	
Finland	3	1.3	85	49	32	354	
Denmark	3	–	0.7	34	26	179	
Sweden	2	–	11	62	79	223	

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