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Supplementary Table 1. Studies documenting racial, ethnic, and/or socioeconomic disparities in exposures to EDCs associated with metabolic disease. ‡: Statistical comparisons between groups not reported, or not possible due to varying detection limits and high non-detect frequency. §: group differences are significant, but single comparisons between groups were not reported. †: Values were estimated from graphs using DigitizeIt software (http://www.digitizeit.de). *Denotes statistically significant differences at P<0.05 or lower.

Abbreviations: AA, African-American; BBP, benzyl butyl phthalate; CI, confidence interval; DBP, dibutyl phthalate; DDE, dichlorodiphenyldichloroethylene; DDT, dichlorodiphenyltrichloroethane; DEHP, di-2-ethylhexyl phthalate; GM: geometric mean; GSD, geometric standard deviation; GSE, geometric standard error; HCB, hexachlorobenzene; β-HCH, β-hexachlorocyclohexane; LSGM, least square geometric mean; MA, Mexican-American; MBzP, mono-benzyl phthalate; MEP, monoethyl phthalate; MnBP, mono-n-butyl phthalate; NHANES: National Health and Nutrition Examination Survey; NHW, Non-Hispanic White; NO_x, nitrogen oxides; PM: particulate matter; ppb, parts per billion; ppm, parts per million; Ref., reference; RSE, relative standard error.

Polychlorinated Biphenyls (PCBs)					
Reference	**Population**	**Assessment**	**Comparisons**	**Pollutants**	**Differences**
James et al., 2002 (1)	Pregnant Women from the Child Health and Development study cohort 1963-1967	Percent difference of serum PCBs between [95% CI]	Non-White vs. White	PCB 105	6.57 [-7.32-22.1]†
				PCB 110	-1.84 [-20.5-21.2]†
				PCB 118	-1.37 [-11.8-10.2]†
				PCB 137	-15.1 [-30.9-3.12]†
				PCB 138	9.5 [-1.69-22.2]†
				PCB 153	5.35 [-4.3-15.9]†
				PCB 170	6.68 [-3.19-18.5]†
				PCB 180	12.8 [2.52-24.2]†*
				PCB 187	17.9 [5.83-31.9]†*
				Sum PCBs	6.28 [-2.05-15.9]
Krieger et al. 1994 (2)	Women from the Northern California Region Kaiser Permanente Medical Care Program, 1964-1971	Adjusted mean difference of serum PCBs (ppb) [95% CI]	AA vs. NHW	PCBs (not specified)	1.4 [0.7-2.1]*
			AA vs. NHW (Breast Cancer Patients)		1.7 [0.8-2.5]*
			AA vs. NHW (Control Patients)		1.1 [0.0-2.2]

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Weintraub and Birnbaum, 2008 (3)	National Adipose Tissue Survey 1972-1979	Population percentage with >3 ppm PCB in adipose tissue; no statistical comparisons are reported	Non-White vs. White	Total PCBs	5.05 vs. 4.52 (1972)†
					11.0 vs. 4.68 (1973)†
					5.58 vs. 4.89 (1974)†
					12.6 vs. 7.00 (1975)†
					12.6 vs. 6.03 (1976)†
					14.6 vs. 8.96 (1977)†
					10.1 vs. 8.02 (1978)†
					6.11 vs. 4.68 (1979)†
					9.71 vs. 6.10 (Average, '72-'79)*
Lordo et al. 1996 (4)	National Human Adipose Tissue Survey 1986	Average adipose levels (ng/g) [RSE]	Non-White vs. White	Tetrachlorobiphenyl	73.0 [22] vs. 53.0 [11]
				Pentachlorobiphenyl	141 [30] vs. 133 [14]
				Hexachlorobiphenyl	435 [15] vs. 289 [8]
				Heptachlorobiphenyl	195 [31] vs. 111 [24]
Wang et al., 2009 (5)	Pregnant women from NHANES 1999-2002	GM for serum lipid adjusted PCBs [95% CI]	AA vs. NHW	PCB-126 (pg/g)	20.3 [16.9–24.5] vs. 13.9 [12.4–15.6]*
				PCB-138/158 (ng/g)	21.7 [19.4–24.2] vs. 16.2 [15.1–17.3]*
				PCB-153 (ng/g)	30.5 [28–33.2] vs. 22.8 [21.5–24.2]*
				PCB-169 (pg/g)	13.4 [12.1–14.9] vs. 10.9 [9.9–12]*
				PCB-180 (ng/g)	17.2 [16.1–18.4] vs. 14.1 [13.2–15]*
			MA vs. NHW	PCB-126 (pg/g)	15.9 [14.2–17.7] vs. 13.9 [12.4–15.6]
				PCB-138/158 (ng/g)	13.9 [12.6–15.4] vs. 16.2 [15.1–17.3]*
				PCB-153 (ng/g)	18.2 [16.5–20] vs. 22.8 [21.5–24.2]*
				PCB-169 (pg/g)	9.4 [8.7–10.2] vs. 10.9 [9.9–12]*
				PCB-180 (ng/g)	12.3 [11.5–13.2] vs.

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					14.1 [13.2–15]*
Bouchard et al., 2014 (6)	NHANES 1999-2002 Elders 60-84 years old	GM [GSD] of serum PCBs (ng/g lipid)	AA vs. NHW	Sum of 12 non–dioxin and dioxin-like PCBs	410 [1.74] vs. 283 [1.67]*
			MA vs. NHW		206 [1.76] vs. 283 [1.67]*
			First PIR quartile vs. fourth quartile		244 [1.80] vs. 294 [1.72]
Xue et al., 2014 (7)	NHANES 2001-2004	Total blood concentration of 30 PCB congeners (ng/g lipid)	AA vs. NHW (>30 years old)	30 PCB congeners	1.97 vs. 1.54†
			AA vs. NHW (50+ years old)		3.08 vs. 2.02
			MA vs. NHW (>30 years old)		1.50 vs. 1.54†
			MA vs. NHW (50+ years old)		1.57 vs. 2.02
			AA vs. NHW (50+ years old, female, 95th percentile)		7.68 vs. 4.72
			AA vs. NHW (50+ years old, male, 95th percentile)		7.70 vs. 4.21
Sjodin et al., 2014 (8)	NHANES 2003-2008 Women and men > 60 years of age	Serum PCB 153 (ng/g lipid) ± 95%CI	AA vs. NHW Females (‘03-‘04)	PCB 153 in people ≥60 years old	146.5 ± 27.7 vs. 62.1 ± 7.8*
			AA vs. NHW Females (‘05-‘06)		129.5 ± 74.8 vs. 58.0 ± 10.8
			AA vs. NHW Females (‘07-‘08)		102.4 ± 15.6 vs. 56.4 ± 7.8*
			AA vs. NHW Males (‘03-‘04)		153 ± 53.6 vs. 65.0 ± 11.0*
			AA vs. NHW Males (‘05-‘06)		103.5 ± 40.9 vs. 60.4 ± 6.2
			AA vs. NHW Males (‘07-‘08)		94.5 ± 29.3 vs. 63.9 ± 10.6
			MA vs. NHW Females (‘03-‘04)		39.5 ± 11.4 vs. 62.1 ± 7.8*

			MA vs. NHW Females (‘05-‘06)		36.2 ± 9.3 vs. 58.0 ± 10.8*
			MA vs. NHW Females (‘07-‘08)		40.9 ± 32.1 vs. 56.4 ± 7.8
			MA vs. NHW Males (‘03-‘04)		36.7 ± 5.5 vs. 65.0 ± 11.0*
			MA vs. NHW Males (‘05-‘06)		37.3 ± 16.8 vs. 60.4 ± 6.2
			MA vs. NHW Males (‘07-‘08)		39.5 ± 8.9 vs. 63.9 ± 10.6*
			AA vs. NHW Females (‘03-‘04)	PCB 153 in people 40-59 years old	53.2 ± 11.9 vs. 34.2 ± 3.5*
			AA vs. NHW Females (‘05-‘06)		41.2 ± 10.1 vs. 27.8 ± 2.5*
			AA vs. NHW Females (‘07-‘08)		35.7 ± 8.0 vs. 27.7 ± 2.3
			AA vs. NHW Males (‘03-‘04)		59.9 ± 27.2 vs. 38.2 ± 9.4
			AA vs. NHW Males (‘05-‘06)		38.8 ± 15.3 vs. 36.4 ± 16.4
			AA vs. NHW Males (‘07-‘08)		41.0 ± 18.6 vs. 28.2 ± 4.8
			MA vs. NHW Females (‘03-‘04)		23.7 ± 10.5 vs. 34.2 ± 3.5
			MA vs. NHW Females (‘05-‘06)		19.1 ± 3.3 vs. 27.8 ± 2.5*
			MA vs. NHW Females (‘07-‘08)		20.9 ± 6.0 vs. 27.7 ± 2.3
			MA vs. NHW Males (‘03-‘04)		26.5 ± 7.3 vs. 38.2 ± 9.4
			MA vs. NHW Males (‘05-‘06)		16.5 ± 2.6 vs. 36.4 ± 16.4*
			MA vs. NHW Males (‘07-‘08)		22.4 ± 6.1 vs. 28.2 ± 4.8
Patterson	NHANES	Serum PCBs	AA vs. NHW (GM)	Sum of 35 PCBs	148.3 [129.0-170.5]

et al., 2009 (9)	2003-2004	(ng/g lipid) [95% CI]			vs. 142.7 [134.2-151.9]
			MA vs. NHW (GM)		71.2 [61.0-83.1] vs. 142.7 [134.2-151.9]*
			AA vs. NHW (90th percentile)		604.6 [454.4-830.6] vs. 406.0 [363.9-433.8]*
			MA vs. NHW (90th percentile)		188.2 [155.8-220.3] vs. 406.0 [363.9-433.8]*
			AA vs. NHW (95th percentile)		984.3 [631.1-1426.9] vs. 508.8 [461.8-539.2]*
			MA vs. NHW (95th percentile)		245.1 [192.7-323.9] vs. 508.8 [461.8-539.2]*
Windham et al., 2010 (10)	6-8 year old girls from California and Ohio 2005-2007	Serum PCB GM (ng/g lipid)	AA vs. NHW	PCB 118	2.4 vs. 3.0*
				PCB 138/158	3.6 vs. 4.5*
				PCB 153	4.2 vs. 6.0*
				PCB 170	1.0 vs. 1.4*
				PCB 180	2.2 vs. 3.2*
			Latinas vs. NHW	PCB 118	2.4 vs. 3.0*
				PCB 138/158	3.6 vs. 4.5*
				PCB 153	4.4 vs. 6.0*
				PCB 170	0.9 vs. 1.4*
				PCB 180	2.1 vs. 3.2*
Organochlorine (OC) Pesticides					
Reference	**Population**	**Assessment**	**Comparisons**	**Pollutants**	**Differences**
Krieger et al. 1994 (2)	Women from the Northern California Region Kaiser	Adjusted mean difference (ppb) [95% CI]	AA vs. NHW	DDE	13.2 [5.6, 20.9]*
			AA vs. NHW (Breast Cancer patients)		15.5 [4.0, 26.9]*

	Permanente Medical Care Program, 1964-1971		AA vs. NHW (Control patients)		11.6 [1.4, 21.8]**
Davies et al., 1969 (11)	Dade County, FL, study population, 1965-1967	Mean adipose (ppm) and whole blood (ppb) DDE	DDE	AA vs. NHW (adipose)	10.8 vs. 5.5*
				AA vs. NHW (serum)	16 vs. 8*
Davies et al., 1972 (12)	Dade County, FL, residents, 1970-1971	Mean [SD] serum DDT and DDE (ppb)	Lowest Social Classes vs. Highest Social Classes (AA)	DDT	10.4 vs. 8.0*
			Lowest Social Classes vs. Highest Social Classes (NHW)		7.4 vs. 5.1*
			AA vs. NHW (Highest Social Class)		7.7 [2.6] vs. 5 [2.7] ‡
			AA vs. NHW (Lowest Social Class)		11.4 [7.0] vs. 7.9 [6.0] ‡
			Lowest Social Classes vs. Highest Social Classes (AA)	DDE	46.8 vs. 35.3*
			Lowest Social Classes vs. Highest Social Classes (NHW)		31.2 vs. 24.3*
			AA vs. NHW (Highest Social Class)		33.1 [11.3] vs. 22.3 [10.4]
			AA vs. NHW (Lowest Social Class)		50.5 [30.1] vs. 33.9 [25.2]
James et al., 2002 (1)	Pregnant Women from the Child Health and Development Study Cohort 1963-1967	Percent difference of serum [95% CI]	Non-White vs. White	*p,p'*-DDE	53.4 [38.3-70.8]†*
				o,p'-DDT	24.5 [6.53-44.2]†*
				p,p'-DDT	48.0 [32.9-64.2]†*
				sum DDTs	53.5 [38.6-69.9]†*

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Lordo et al. 1996 (4)	National Human Adipose Tissue Survey 1986	Average adipose concentrations (ng/g) [RSE]	Non-White vs. White	pp'-DDT	301 [25] vs. 152 [15]
				pp'-DDE	2780 [25] vs. 2250 [13]
				β-HCB	212 [32] vs. 146 [21]
				Heptachlor epoxide	51.6 [19] vs. 58.8 [8]
				Oxychlordane	103 [22] vs. 116 [8]
				trans-nonachlor	131 [32] vs. 130 [14]
				Dieldrin	54.1 [41] vs. 45.6 [21]
Wang et al., 2009 (5)	Pregnant women in NHANES 1999-2002	GM for serum lipid adjusted pesticides [95% CI]	AA vs. NHW	β-HCH (ng/g)	7.3 [6.5–8.3] vs. 6.7 [6.2–7.2]
				p,p'-DDE (ng/g)	311.6 [253.2–383.4] vs. 177.2 [156.7–200.3]*
				trans-nonachlor (ng/g)	18.2 [16–20.8] vs. 13.9 [12.7–15.2]*
			MA vs. NHW	β-HCH (ng/g)	19 [16–22.5] vs. 6.7 [6.2–7.2]*
				p,p'-DDE (ng/g)	806.8 [674.6–964.8] vs. 177.2 [156.7–200.3]*
				trans-nonachlor (ng/g)	14.8 [13.2–16.7] vs. 13.9 [12.7–15.2]
Harley et al., 2008 (13)	Pregnant women in in the Center for the Health Assessment of Mothers and Children of Salinas (CHAMACOS) cohort, 1999-2000	GM (ng/g lipid) [range] for CHAMACOS cohort, Median (ng/g lipid) [range] for NHANES	CHAMACOS vs. NHANES	*p,p'*-DDE	1,500 [49 - 159,303] vs. 210.5 [5.4 - 17,900] ‡
			CHAMACOS vs. NHANES	*p,p'*-DDT	24 [2 - 33,174] vs. 6.8 [3.3 - 1,070] ‡
			CHAMACOS vs. NHANES	*o,p'*-DDT	2 [0.1 - 1,878] vs. <LOD‡

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Bradman et al., 2007 (14)	Pregnant women in the CHAMACOS cohort, 1999-2000	Median serum pesticides (ng/g lipid)	CHAMACOS vs. NHANES	HCB	64.9 vs. <LOD‡
			CHAMACOS vs. NHANES	β-HCH	36.9 vs. 5‡
Windham et al., 2010 (10)	6-8 year old girls from California and Ohio 2005-2007	GM (ng/g lipid)	AA vs. NHW	HCB	6.6 vs. 7.8*
			Latinas vs. NHW		7.8 vs. 7.8
			AA vs. NHW	*trans*-nonachlor	3.4 vs. 4.7*
			Latinas vs. NHW		4.3 vs. 4.7
			AA vs. NHW	p,p-DDE	69.1 vs. 72.1
			Latinas vs. NHW		110.7 vs. 72.1*
Patterson et al., 2009 (9)	NHANES 2003-2004	LSGM of serum pesticides (ng/g lipid) [95% CI]	AA vs. NHW	HCB	14.8 [14.3-15.3] vs. 15.0 [14.2-15.8]
			MA vs. NHW		17.2 [15.9-18.6] vs. 15.0 [14.2-15.8]*
			AA vs. NHW	GM of pp'-DDE	262.4 [233.38-294.98] vs. 208.2 [165.00-262.54]
			MA vs. NHW		444.2 [361.72-545.43] vs. 208.2 [165.00-262.54]*
			AA vs. NHW	β-HCH at the 75th percentile	9.60 [8.30-11.90] vs. 12.80 [10.90-14.70]
			MA vs. NHW		23.50 [17.50-29.90] vs. 12.80 [10.90-14.70]*
			AA vs. NHW	pp'-DDT at the 90th percentile	17.50 [14.80-25.40] vs. 9.70[8.50-11.20]*
			MA vs. NHW		24.00 [18.50-33.30]

					vs. 9.70[8.50-11.20]*
			AA vs. NHW	pp'-DDT at the 95th percentile	30.70 [19.00-53.40] vs. 12.90 [10.70-16.60]
			MA vs. NHW		48.60 [31.00-71.10] vs. 12.90 [10.70-16.60]*
			AA vs. NHW	GM of *trans*-nonachlor	14.4 [12.24-16.98] vs. 15.8 [13.72-18.21]
			MA vs. NHW		10.2 [7.68 - 13.24] vs. 15.8 [13.72-18.21]*
Chemical Constituents of Air Pollution					
Reference	**Population**	**Assessment**	**Comparisons**	**Pollutants**	**Differences**
Bell and Ebisu, 2012 (15)	215 U.S. Census tracts from 2000-2006	Percent increase in long-term average exposure per an additional 10% increase in demographic	AA	$PM_{2.5}$	1.88*
			Latino		0.13
			NHW		-1.37*
Jones et al. 2014 (16)	5921 participants from the Multi-Ethnic Study of Atherosclerosis, 2000-2002	Ambient GM for $PM_{2.5}$ ($\mu g/m^3$), and NOx (ppb)	AA vs. NHW	$PM_{2.5}$	16.5 [16.4, 16.6] vs. 15.7 [15.6, 15.8]*
			Latinos vs. NHW		16.9 [16.8, 17.1] vs. 15.7 [15.6, 15.8]*
			AA vs. NHW	NOx	43.3 [42.2, 44.4] vs. 33.6 [33.0, 34.4]*
			Latinos vs. NHW		58.7 [57.1, 60.4] vs. 33.6 [33.0, 34.4]*
Schweitzer and Zhou, 2010 (17)	80 metropolitan areas in the U.S.	Coefficient of total exposure: Log (μ x p x e) +1); μ =	% AA	$PM_{2.5}$	3.82*
			% Latino		0.23

		concentration at pollution monitor, *p* = population living within ½ mile of monitor, *e* = total number of days monitor reported levels higher than federal standards from 2001-2003	%Poverty		8.85*
			% AA	Ozone	2.37*
			% Latino		0.02
			% Poverty		1.77*
Miranda et al. 2011 (18)	U.S. Census demographics from 2000, air quality data from 587 U.S. counties from 2005-2007	Odds Ratio for a county being in the worst 20% vs. best 20% of counties for each pollution metric per increase in IQR for each demographic across all U.S. counties	% AA	Annual $PM_{2.5}$	2.73*
			% Latino		0.83
			% Living in Poverty		3.95*
			% AA	Daily $PM_{2.5}$	1.58*
			% Latino		1.13
			% Living in Poverty		1.92*
Clark et al. 2014 (19)	U.S. population demographics from 2000, air pollution data from 2006	Population-weighted mean (ppb)	Non-White vs. White	NO_2	14.5 vs. 9.9, 38% Relative Difference*
			AA vs. NHW		13.3 vs. 9.9
			Latinos vs. NHW		15.6 vs. 9.9
			Non-White vs. White (children below the poverty line)		14.3 vs. 9.1

			Non-White vs. White (elderly below the poverty line)		14.5 vs. 9.9
Bisphenol A (BPA)					
Reference	**Population**	**Assessment**	**Comparisons**	**Pollutants**	**Differences**
Calafat et al., 2008 (20)	NHANES 2003-2004	Adjusted LSGM [95% CI] of Total urinary BPA (µg/L)	Income <$20,000 vs. >$45,000	BPA	3.1 [2.7–3.5] vs. 2.5 [2.3–2.7]*
LaKind and Naiman, 2011 (21)	NHANES 2005-2006	Total urinary BPA (ng/mL)	AA vs. NHW	BPA	Higher urinary BPA levels in AA than NHW, (Wilcoxon test, P< 0.00001); Note: Original article does not provide urinary concentrations
Nelson et al., 2012 (22)	NHANES 2003-2006	Total urinary median BPA (µg/g creatinine)	Emergency food assistance vs. no food assistance (Children, 6-11 years olds)	BPA	Percent change 54 [13 to 112]*
			Lowest family Income vs. highest family income		2.5 vs. 1.8 µg/g; Percent Change: 22.8 [10.6, 36.4]*
			Very low food security vs. full food security		2.6 vs. 2.0 µg/g; Percent change: 19.6 [5.6, 35.5]*
			AA vs. NHW		2.2 vs. 2.2 µg/g
			MA vs. NHW		1.9 vs. 2.2 µg/g
Unal et al., 2012 (23)	South Carolina Pilot Study of 27 pregnant women	Total serum median [range] BPA (ng/mL)	AA vs. NHW	BPA	30.13 [0–134.8] vs. 3.14 [0–37.1]*
			Latinas vs. NHW		24.46 [0.2–153.5] vs. 3.14 [0–37.1]
			Unemployed vs. Employed		41 [8.55–153] vs. 7.45 [0–43.7]†*
Phthalates					

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Reference	Population	Assessment	Comparisons	Pollutants	Differences
Koo et al., 2002 (24)	NHANES 1988-1994	Relation between the log of exposure estimates for phthalates and demographic factors	Monthly family income <$1,500 vs. ≥$1,500	BBP	0.23*
			Monthly family income <$1,500 vs. ≥$1,500	DEHP	0.68*
Silva et al., 2004 (25)	NHANES 1999-2000	LSGM of urinary phthalates (µg/L)	AA vs. NHW	MEP	237.8 vs. 162.1*
			MA vs. NHW		191.9 vs. 162.1
			AA vs. NHW	MBzP	14.7 vs. 15.5
			MA vs. NHW		13.1 vs. 15.5*
Branch et al., 2015 (26)	2001-2004 NHANES, (20-49 year old women)	GM [GSE] of urinary phthalates (ng/mL); percent change [95% CI]	AA vs. NHW	MEP	268 [26.5] vs. 127 [10.7]; Percent change: 48.4 [16.8-88.6]*
			MA vs. NHW		247 [26.1] vs. 127 [10.7]; Percent change: 58 [24.7-100.8]*
			AA vs. NHW	MnBP	32.3 [2.0] vs. 18.2 [1.0] §
			MA vs. NHW		23.7 [2.3] vs. 18.2 [1.0] §
Trasande et al., 2013 (27)	2003-2008 NHANES, (12-19 years old)	Mean urinary phthalates (µM)	AA vs. NHW	Low molecular weight phthalates	1.010 vs. 0.662*
			MA vs. NHW		0.891 vs. 0.662*
			First PIR quartile (poor) vs. fourth PIR quartile		0.982 vs. 0.727*
Kobrosly et al., 2012 (28)	NHANES 2001-2008, (20-39 year old women)	Multiplicative differences in urinary phthalate levels [95%	Non-white vs. white	DBP molar sum	1.26 [1.12-1.40]*
			Income-to-poverty ratio 0-1 (most poor) vs. 4-5		1.16 [1.03-1.32]*
			Non-white vs. white	MEP	1.44 [1.24-1.68]*
			Income-to-poverty ratio	MBzP	1.62 [1.37-1.91]*

		CI]	0-1 (most poor) vs. 4-5		
			Food Security (Full, Marginal, Low, Very Low)	DBP molar sum	1 (ref), 1.07 [0.87, 1.31], 1.19 [0.97, 1.46], 1.30 [0.98, 1.73]; Trend*
				MBzP	1 (ref), 1.14 [0.97, 1.35], 1.17 [0.95, 1.45] 1.24 [0.98, 1.56]; Trend*

SUPPLEMENTARY DATA

References for Supplementary Table 1

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SUPPLEMENTARY DATA

Supplementary Table 2. Representative animal and cellular studies linking endocrine disrupting chemicals (EDCs) with metabolic dysfunction.

Metabolic Alteration	Polychlorinated Biphenyls (PCBs)	Organochlorine (OC) Pesticides	Chemicals Constituents of Air Pollution	Bisphenol A (BPA)	Phthalates
Weight Gain and/or Increased Adiposity	**(1)**	**(2)**	**(3, 4)**	**(5)**	**(6)**
Glucose Intolerance	**(7)**	**(2)**		**(8)**	**(9)**
Systemic and/or Cellular Insulin Resistance or Hyperinsulinemia	**(7)**	**(2)**	**(10)**	**(8, 11, 12)**	**(13, 14)**
Altered β-cell Function, Reduced β-cell Mass, or Increased Insulitis	**(15)**	**(16)**		**(12, 17, 18)**	**(9)**
Altered Hepatic Gene Expression, Lipid Handling, and Steatosis	**(19, 20)**	**(20)**	**(4)**	**(21)**	**(22)**
Altered Adipocyte Differentiation and Adipose Gene Expression, including Inflammatory Mediators	**(1)**	**(23)**	**(10)**	**(11, 24, 25)**	**(6)**
Alterations α-cell Signaling				**(26)**	

SUPPLEMENTARY DATA

References for Supplementary Table 1

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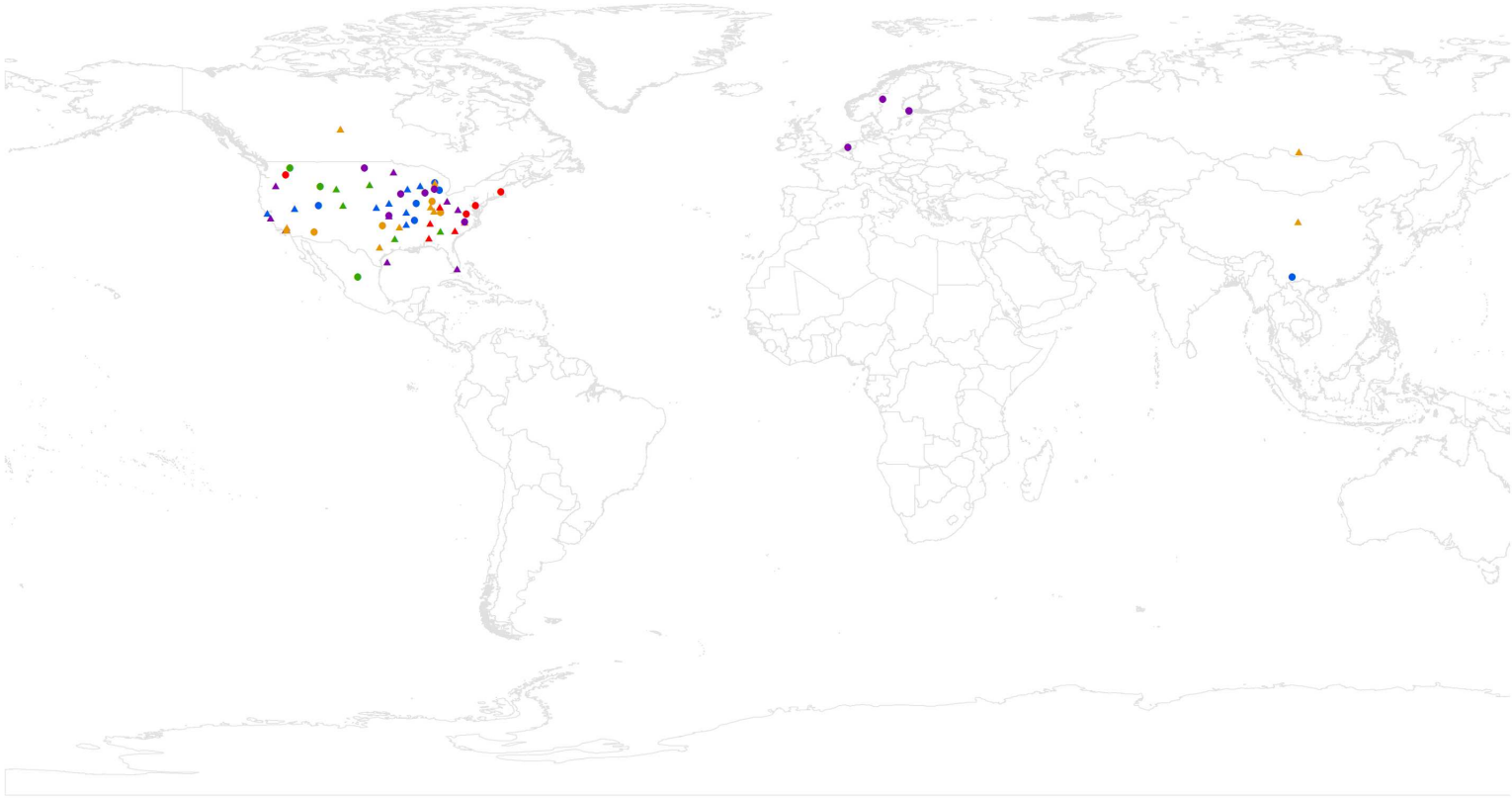
SUPPLEMENTARY DATA

Supplementary Figure 1. Geographic location of studies linking exposure to endocrine disrupting chemicals (EDCs) with diabetes (from **Table 1**) as well as studies documenting racial, ethnic, and socioeconomic disparities in exposures to diabetogenic EDCs (from **Supplemental Table 1**).



SUPPLEMENTARY DATA

Healthcare Provider Guide: Strategies for Reducing Environmental Exposures Linked to Diabetes

This Guide was developed based upon interpretation of the current scientific literature. The intent of this document is to assist healthcare practitioners in providing guidance to their patients who seek to take a precautionary approach with regard to their environmental exposures as one component of a comprehensive, individualized diabetes treatment plan. While the chemicals discussed in this Guide have been linked to diabetes, research is ongoing regarding the human health effects arising from these exposures.

Polychlorinated Biphenyls (PCBs)

What are PCBs? PCBs are a class of 209 synthetic chemicals introduced in the U.S. in the 1930s. Based on their unique chemical properties, PCBs were used in electrical, heat transfer, and hydraulic equipment; as plasticizers in paints, plastics, and rubber products; as pigments and dyes; and for a variety of other industrial purposes. PCBs were banned by the U.S. Environmental Protection Agency in 1977; however, they remain detectable in human tissues due to their environmental and biological persistence.

What are sources of exposure to PCBs?

1. Contaminated fish, meat, and dairy products, including bottom-feeding freshwater fish that consume PCB-laden sediment
2. Dusts contaminated with low levels of PCBs coating the surfaces of fruits and vegetables
3. Contaminated drinking water arising from PCB leaching from toxic waste sites or old submersible pumps containing PCBs
4. Older fluorescent lights with transformers or ballasts containing PCBs
5. Deterioration of old building materials, including paints and caulking

Air Pollution

What is air pollution? Air pollution is a diverse mixture of natural and human-made airborne substances that arise from outdoor and indoor sources. These substances include fine particles, noxious gases, ground level ozone, tobacco smoke, mold, pollen, building materials, and household products and chemicals.

What are sources of exposure to air pollution?

1. Burning of fossil fuels (including power plants, motorized vehicles, and lawn care equipment)
2. Chemical plants, factories, refineries, and gas stations
3. Gas appliances, paints, solvents, and household chemicals
4. Combustion of organic matter (including fireplaces, wood stoves, charcoal grills, and leaf burning)

Bisphenol A (BPA)

What is BPA? BPA is a common synthetic chemical used in the production of polycarbonate and other plastics commonly used in consumer products. BPA is used to make plastics more rigid. It is also employed in the lining of food and beverage cans and thermal paper used for generating receipts. Exposure to BPA is nearly universal in the U.S. population.

What are sources of exposure to BPA?

1. Polycarbonate plastics, including some water and baby bottles, compact discs, impact-resistant safety equipment, and medical devices
2. Epoxy resins coating food cans, bottle tops, and water supply pipes
3. Thermal paper, including sales receipts
4. Some dental sealants and composites

Phthalates

What: Phthalates are a diverse class of widely used synthetic compounds. Phthalates are used to enhance the flexibility of plastics, including those composed of polyvinyl chloride (PVC). They are also used in a variety of personal care products, including fragrances, cosmetics, shampoos, and lotions. They can be found in some

plastic medical devices and some time-released medications. Phthalates are also found as contaminants of the food supply with high fat and processed foods having particularly high levels.

What are sources of exposure to phthalates?

1. Plastic food and beverage containers
2. Plastic toys, shower curtains, and raincoats
3. Personal care products, such as perfumes, hair sprays, deodorants, and nail polishes
4. Most consumer products containing “fragrances”, including shampoos, air fresheners, and detergents
5. Carpeting, vinyl flooring, and plastic coatings on wires, cables, and other equipment
6. Medical devices, including IV bags and tubing as well as some extended-release medications
7. Polyvinyl chloride (PVC)-containing products
8. Contaminated food and water

Organochlorine (OC) Pesticides

What: Organochlorine (OC) pesticides were an early generation of synthetic pesticides used extensively in the U.S. for agriculture and mosquito control. This class includes such pesticides as dieldrin, methoxychlor, and dichlorodiphenyltrichloroethane, commonly known as DDT. They were banned by the U.S. Environmental Protection Agency in the 1970s; however, their use continued in other countries for decades. Indeed, DDT is still used in a few countries for malaria control. Largely because of their environmental and biological persistence, several OC pesticides and their metabolites are still measurable in the U.S. population.

What are sources of exposure to OC pesticides?

1. Some high-fat dairy products, high-fat meats, and fatty fish
2. Dust and soil from past use
3. Some shampoos used to treat lice that contain lindane
4. Exposures outside the U.S.

Data Sources and Further Reading

Polychlorinated Biphenyls (PCBs)

United States Environmental Protection Agency
https://www.epa.gov/pcbs/learn-about-polychlorinated-biphenyls-pcbs

Illinois Department of Public Health
http://www.idph.state.il.us/cancer/factsheets/polychlorinatedbiphenyls.htm

Air Pollution

American Lung Association
http://www.lung.org/our-initiatives/healthy-air/outdoor/air-pollution/10-tips-to-protect-yourself.html

National Institute of Environmental Health Sciences
https://www.niehs.nih.gov/health/topics/agents/air-pollution/index.cfm

European Respiratory Society
http://www.europeanlung.org/assets/files/factsheets/ten-top-tips-en.pdf

Bisphenol A

National Toxicology Program
https://www.niehs.nih.gov/research/supported/assets/docs/a_c/bpa_fact_sheet_508.pdf

Pediatric Environmental Health Specialty Units
http://www.pehsu.net/_Phthalates_and_Bisphenol_A_Advisory.html

Phthalates

Centers for Disease Control and Prevention
https://www.cdc.gov/biomonitoring/phthalates_factsheet.html

Pediatric Environmental Health Specialty Units
http://www.pehsu.net/_Phthalates_and_Bisphenol_A_Advisory.html

Organochlorine (OC) Pesticides

California Environmental Contaminant Biomonitoring Program

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http://biomonitoring.ca.gov/sites/default/files/downloads/OrganochlorinePesticidesFactSheet_0.pdf

Delaware Health and Social Services
http://dhss.delaware.gov/dph/files/organochlorpestfaq.pdf

Suggestions for Reducing Exposures to Chemicals Linked to Diabetes

Food and Water

1. Consult local guides regarding which sport fish are safe to consume.
2. Trim fat from meat and the skin from fish and cook using a rack to allow fat to drain.
3. Wash fruits and vegetables before consuming them.
4. Don't microwave polycarbonate plastic food containers or use them for storing hot liquids.
5. Avoid plastic containers designated #3, #6, and #7.
6. Eat fresh and frozen foods while reducing consumption of canned and processed foods.
7. Opt for glass, porcelain, or stainless steel containers when possible, especially for hot food and drinks.
8. Prepare more meals at home and emphasize fresh ingredients.
9. Consider using a water filter.
10. If possible, purchase organic produce, meat, and dairy products.
11. Eat a diversified diet with plenty of variety.

Exercise and Activity

1. Check air quality in your area [https://airnow.gov].
2. Avoid outdoor exercise when pollution levels are high.
3. Avoid exercise near high traffic areas. Instead, choose routes away from busy roads and vehicles.

Personal Care

1. Read labels and avoid products containing phthalates.
2. Choose products labeled "Phthalate-Free" and "BPA-Free".
3. Avoid fragrances and opt for cosmetics labeled "no synthetic fragrance", "scented only with essential oils", or "phthalate-free".
4. Wash your hands often, especially before preparing and eating food.
5. Minimize handling of receipts and thermal paper.

Around the Home

1. For those with a submersible pump in their well who notice an oily film or fuel odor in their well water, check to see if the pump has failed and, if so, replace it. Contact your local Department of Public Health for information on how to clean the well.
2. Old fluorescent bulbs and deteriorating construction materials from older buildings should be replaced and discarded safely. Contact your local Department of Public Health.
3. Don't burn wood or trash.
4. Use hand-powered or electric lawn care equipment instead of gas-powered alternatives.
5. Forbid smoking indoors and advocate for measures to make public spaces tobacco-free.
6. Clean your floors regularly and remove dust from your home with a damp cloth.
7. Plant trees, which filter out airborne gases and particulate matter.

For Children

1. Avoid hand-me-down plastic toys.
2. Opt for infant formula bottles and toys that are labeled "BPA-Free".

Transportation

1. Choose transportation options and transit routes that limit time sitting in traffic.
2. Encourage your child's school to reduce school bus emissions, including reducing idling.

SUPPLEMENTARY DATA

Disclaimer: The suggestions listed above are based upon limited scientific studies examining the impact of lifestyle interventions on levels of chemicals in humans. Where studies have not been conducted, exposure reduction strategies are based upon common sources of exposure. Ongoing studies will provide further guidance on best practices for risk reduction. Because many chemicals are used for multiple purposes and in a diverse array of products, an individual may have additional exposures that will not be addressed by these general suggestions. Such individuals should consult with their healthcare provider for individualized guidance.