Environment-Wide Association Study of Blood Pressure in the National Health and Nutrition Examination Survey (1999-2012)

Denise P. McGinnis¹, John S. Brownstein¹, *Chirag J. Patel²

A) SBP (all ages)		2007-2008			2009-2010			2011-2012	
Variable Name									
(change per 1 SD	Effect	95% CI	p-	Effect	95%CI	p-	Effect	95%CI	p-
of the logarithm	Size		value	Size		value	Size		value
of factor)	(mmHg)			(mmHg))		(mmHg)		
Alcohol	0.03	[0.02, 0.05]	0.011	0.05	[0.03, 0.06]	0.003	NA	NA	NA
Mercury, urine	-1.43	[-2.27,0.06]	0.016	-1.10	[-2.04,-0.17]	0.060	NA	NA	NA
Equol	-1.23	[-2.20,0.26]	0.050	-1.74	[-2.62, -0.86]	0.008	NA	NA	NA
Cadmium, urine	-1.10	[-2.04,0.02]	0.063	-1.54	[-2.64,-0.43]	0.034	-0.96	[-2.46,0.53]	0.247
B) SBP		2007-2008			2009-2010			2011-2012	
B) SBP (age<18 years)		2007-2008			2009-2010			2011-2012	
SDI		2007-2008			2009-2010			2011-2012	
(age<18 years)	Effect	2007-2008 95% CI	р-	Effect	2009-2010 95%CI	р-	Effect	2011-2012 95%CI	р-
(age<18 years) Variable Name	Effect Size		p- value	Effect Size		p- value	Effect Size		p- value
(age<18 years) Variable Name (change per 1 SD			-		95%CI	-		95%CI	_
(age<18 years) Variable Name (change per 1 SD of the logarithm	Size		-	Size	95%CI	-	Size	95%CI	_
(age<18 years) Variable Name (change per 1 SD of the logarithm of factor)	Size (mmHg)	95% CI	value	Size (mmHg)	95%CI	value	Size (mmHg)	95%CI	value
(age<18 years) Variable Name (change per 1 SD of the logarithm of factor) Alcohol	Size (mmHg) -0.01	95% CI [-0.11,0.09]	value 0.816	Size (mmHg) -0.12	95%CI [0.31,0.78]	value 0.302	Size (mmHg) NA	95%CI NA	value NA

SBP	2007-2008				2009-2010		2011-2012		
(age>=18 years)									
Variable Name									
(change per 1	Effect	95% CI	p-	Effect	95%CI	p-value	Effect	95%CI	p-
SD of the	Size		value	Size			Size		value
logarithm of	(mmHg)			(mmHg)			(mmHg)		
factor)									
Alcohol	0.03	[0.01, 0.05]	0.071	0.05	[0.03, 0.07]	0.010	NA	NA	NA
Mercury, urine	-1.36	[-2.47,0.25]	0.075	-0.48	[-1.57,0.60]	0.433	NA	NA	NA
Equol	-1.71	[-3.15,0.27]	0.081	-1.58	[-2.52,-0.64]	0.030	NA	NA	NA
Cadmium, urine	-0.91	[-2.93,1.11]	0.428	-0.16	[-1.83,1.50]	0.856	-0.66	[2.34,1.03]	0.480

Supplemental Table S1. List of environmental factors with an FDR<1% in 1999-2006 meta-analysis that replicated in at least one survey between 2007-2012 with a p<.05 for systolic blood pressure. A) Results for original model adjusted for age, sex, BMI, age-squared, poverty and race/ethnicity for all ages combined. B) Results after additional adjustment for creatinine and cotinine for ages<18 years .C) Results after additional adjustment for creatinine and cotinine for ages>=18 years. SD=Standard Deviation. CI=Confidence Interval. NA=Not Available.

A) DBP (all ages)		2007-2008			2009-2010			2011-2012	
Variable Name (change per 1 SD of the logarithm of factor)	Effect Size (mmHg)	95% CI	p- value	Effect Size (mmHg)	95% CI	p- value	Effect Size (mmHg)	95% CI	p- value
Cesium, urine	-0.02	[-0.84,0.81]	0.972	-0.99	[-1.64,-0.35]	0.024	-0.05	[-0.88, 0.79]	0.917
B) DBP (age<18 years)		2007-2008			2009-2010			2011-2012	
Variable Name	77.00						7 00 .	0=0/ 0=	
(change per 1 SD of the logarithm of factor)	Effect Size (mmHg)	95% CI	p- value	Effect Size (mmHg)	95% CI	p- value	Effect Size (mmHg)	95% CI	p- value
the logarithm of	Size	95% CI [-1.19, 2.23]	-	Size	95% CI [-5.71, -1.18]	-	Size	95% CI [-0.70,6.32]	_
the logarithm of factor) Cesium, urine C) DBP (age>=18 years)	Size (mmHg)		value	Size (mmHg)		value	Size (mmHg)		value
the logarithm of factor) Cesium, urine C) DBP	Size (mmHg)	[-1.19, 2.23]	value	Size (mmHg)	[-5.71, -1.18]	value	Size (mmHg)	[-0.70,6.32]	value

Supplemental Table S2. List of environmental factors with an FDR<1% in 1999-2006 meta-analysis that replicated in at least one survey between 2007-2012 with a p<.05 for diastolic blood pressure. A) Results for original model adjusted for age, sex, BMI, age-squared, poverty and race/ethnicity for all ages combined. B) Results after additional adjustment for creatinine and cotinine for ages<18 years. C) Results after additional adjustment for creatinine and cotinine for ages>=18 years. SD=Standard Deviation. CI=Confidence Interval. NA=Not Available