Table 1: Bivariate Analysis of variables with Blood Lead Level, NHANES in United States, 2015-2016 (n = 600)

	Total N (%)	Mean [Blood Lead Level] (SD)[1]	*p*-value
Sex			0.201[1]
Male	327 (54.31)	1.69 (1.18)	
Female	275 (45.68)	1.58 (1.01)	
Race/Hispanic Origin			0.393[2]
Mexican American	87 (14.45)	1.49 (1.21)	
Other Hispanic	82 (13.62)	1.65 (1.22)	
Non-Hispanic White	250 (41.53)	1.60 (1.00)	
Non-Hispanic Black	126 (20.93)	1.75 (1.12)	
Other Race - Including Multi-Racial	57(9.47)	1.79 (1.20)	
Race/Hispanic Origin with Non-Hispanic Asian			0.423[2]
Mexican American	87 (14.45)	1.49 (1.21)	
Other Hispanic	82 (13.62)	1.65 (1.22)	
Non-Hispanic White	250 (41.53)	1.60 (1.00)	
Non-Hispanic Black	126 (20.93)	1.75 (1.12)	
Non-Hispanic Asian	33(5.48)	1.90 (0.36)	
Other Race – Including Multi-Racial	24(3.99)	1.63 (1.38)	
Country of Birth			0.024[1]
Born in 50 US states or Washington, DC	458(76.08)	1.58 (1.08)	
Others	144(23.92)	1.83 (0.10)	
Citizenship Status			0.620[1]
Citizen by Birth or Naturalization	533 (88.54)	1.63 (1.12)	
Not a Citizen of the US	50(8.31)	1.70 (1.04)	
Education level - Adults 20+			0.032[2]
Less than 9th grade	84(13.95)	2.03 (1.46)	
9-11th grade (Includes 12th grade with no diploma)	168(27.91)	1.74 (1.11)	
High School graduate / GED or Equivalent	182(30.23)	1.64 (1.04)	
Some College or AA Degree	117(19.44)	1.48 (1.11)	
College Graduate or above	69 (11.46)	1.63 (1.00)	

1 *p*-value for *t*-test

2 *p*-value for ANOVA

Acronyms: SD (standard deviation)

Table 1: Bivariate Analysis of variables with Blood Lead Level, NHANES in United States, 2015-2016 (n = 600)

	Total N (%)	Mean [Blood Lead Level] (SD)/Pearson's r	*p*-value
Marital Status			<0.001[2]
Married	283 (47.01)	1.60 (1.06)	
Widowed	46 (7.64)	2.11 (1.13)	
Divorced	80 (13.29)	1.87 (1.17)	
Separated	26 (4.32)	2.08 (1.82)	
Never Married	97 (16.63)	1.34 (0.87)	
Living with Partner	70 (11.63)	1.47 (1.01)	
Ratio of Family Income to Poverty	NA	-0.08[1]	0.039[3]
Body Mass Index (Kg/mm**2)	NA	-0.11[1]	0.006[3]
Age	NA	0.36[1]	<0.001[3]
Blood Cadmium (ug/L)	NA	0.20[1]	<0.001[3]
Blood Selenium (ug/dL)	NA	-0.19[1]	<0.001[3]
Blood Manganese (ug/L)	NA	-0.06[1]	0.170[3]
Do you now smoke cigarettes?			0.056[2]
Every day	225 (37.38)	1.77 (1.12)	
Some days	72 (11.96)	1.46 (1.08)	
Not at all	305 (50.66)	1.56 (1.10)	

1 Pearson's *r* for age
2 *p*-value for ANOVA
3 *p*-value for Pearson's r
Acronyms: SD (standard deviation)

Table 2: Bivariate associations with “Do you now smoke cigarettes (exposure), NHANES in United States 2015-2016, (n = 600)

	Total	Do you now smoke cigarettes?			
	N (%)	Every Day N (%) / Med [IQR]	Some Days N (%) / Med [IQR]	Not at All N (%) / Med [IQR]	*p*-value[2]
Sex					<0.001[2]
Male	327(54.31)	101(30.89)	51(15.60)	175(53.52)	
Female	275(45.68)	124(45.09)	21(7.64)	130(47.27)	
Race/Hispanic Origin					<0.001[2]
Mexican American	87(14.45)	29(33.33)	19(21.84)	39(44.83)	
Other Hispanic	82(13.62)	23(28.05)	5(6.10)	54(65.85)	
Non-Hispanic White	250 (41.53)	93(37.20)	16(6.40)	141(56.40)	
Non-Hispanic Black	126 (20.93)	55(43.65)	26(20.63)	45(35.71)	
Other Race - Including Multi-Racial	57(9.47)	25(43.86)	6(10.53)	26(45.61)	
Race/Hispanic origin with Non-Hispanic Asian					<0.001[2]
Mexican American	87(14.45)	29(33.33)	19(21.84)	39(44.83)	
Other Hispanic	82(13.62)	23(28.05)	5(6.10)	54(65.85)	
Non-Hispanic White	250(41.53)	93(37.20)	16(6.40)	141(56.40)	
Non-Hispanic Black	126(20.93)	55(43.65)	26(20.63)	45(35.71)	
Non-Hispanic Asian	33(5.48)	15(45.45)	3(9.09)	15(54.45)	
Other Race - Including Multi-Racial	24(3.99)	10(41.67)	3(12.50)	11(45.83)	
Country of Birth					0.225[2]
Born in 50 US states or Washington, DC	458(76.08)	178(38.86)	57(12.45)	223(48.69)	
Others	144(23.92)	47(32.64)	15(10.42)	82(56.94)	
Citizenship Status					0.167[2]
Citizen by birth or naturalization	533(88.54)	206(38.65)	61(11.44)	266(49.90)	
Not a citizen of the US	69(11.46)	19(27.54)	11(15.94)	39(56.52)	
Education Level – Adult 20+					0.004[2]
Less than 9th grade	50(8.31)	20(40.00)	6(12.00)	24(48.00)	
9-11th grade (Includes 12th grade with no diploma)	84(13.95)	44(52.38)	13(15.48)	27(32.14)	
High school graduate/GED or equivalent	168(27.91)	72(42.86)	15(8.93)	81(48.21)	
Some college or AA degree	182(30.23)	53(29.12)	26(14.29)	103(56.59)	
College graduate or above	117(19.44)	35(29.91)	12(10.26)	70(59.83)	

1 *p*-value for simple logistic regression

2 *p*-value for chi-square test

Acronyms: Med (median); IQR (interquartile range)

**Had to put boxes for p-values as default table did not allow somehow to put these in front of the variables.

Table 2: Bivariate associations with “Do you now smoke cigarettes (exposure), NHANES in United States 2015-2016, (n = 600)

	Total	Do you now smoke cigarettes?			
	N (%)	Every Day N (%) / Med [IQR]	Some Days N (%) / Med [IQR]	Not at All N (%) / Med [IQR]	*p*-value[2]
Marital Status					<0.001[2]
Married	283(47.01)	86	25	172	
Widowed	46(7.64)	16	4	26	
Divorced	80(13.29)	37	4	39	
Separated	26(4.32)	14	5	7	
Never Married	97(16.63)	38	23	36	
Living With Partner	70(11.3)	34	11	25	
Age	NA	50[22-89]	35.5[22-67]	58[22-80]	0.234[1]
Blood Cadmium (ug/L)	NA	1[0.17-3.07]	0.48[0.16-2.56]	0.34[0.07-.25]	<0.001[1]
Ever used an e-cigarette					
Yes	181(30.07)	93(51.38)	35(19.34)	53(29.28)	<0.001[2]
No	421(69.83)	132(31.35)	37(8.79)	252(59.86)	
Ever Used Smokeless Tobacco?					
Yes	132((21.93)	38(28.79)	18(13.64)	76(57.58)	0.030[2]
No	470 (78.07)	187(39.79)	54(11.49)	229(48.72)	

1 *p*-value for simple logistic regression

2 *p*-value for chi-square test

Acronyms: Med (median); IQR (interquartile range)

Description

Upon bivariate analysis of our outcome with various potential covariates and exposure I found out that our main outcome of interest that is “Blood Lead level” is significantly correlated with main exposure “Do you now smoke cigarettes?” (p-value = 0.056). Although not all demographic variables are significant at 95% level of confidence, but variables like ‘country of birth’, ‘Education Level – Adults 20+’, ‘Marital statuses, and ‘Ratio of family income to poverty’ are highly significant for out outcome at the same level. ‘Age’ came out to be highly significant too at 5% level.

Also, I found out during the analysis that some variables other than the exposure and demographic variables are also significant. ‘Blood Cadmium level’ and ‘Blood Selenium’ are these variables which are positively correlated to our outcome.

I also ran a bivariate analysis of our exposure with potential covariates and cofounders and found out that our exposure is significantly correlated to almost all demographic variables except ‘Country of Birth’, ‘Citizenship status’ and ‘Marital status’. Stats show that non-Hispanic white people are the largest among all to smoke cigarettes now, while Males smoke more often than females. People who were born in United states were found out to be smoking more often than others. Age do not have much effect on our exposure.

We can clearly say that variable age can be a possible confounder which is significantly correlated to outcome but not in the causal path of exposure and outcome. The variable ‘Race/Hispanic Origin with Non-Hispanic Asian‘ might be an effect modifier as it has very high effect on exposure but not significant to the outcome.