SUPPLEMENTAL MATERIAL

Supplemental Table 1. Distributions of number of zero-emissions vehicles (nZEV) per 1,000 population and age-adjusted asthma-related emergency department (ED) visit rates by year among zip codes included in the asthma ED visit rate and nitrogen dioxide (NO_2) analysis. Mean (standard deviation) presented.

Characteristic/Year	**Zip codes in asthma ED visit analysis** (n=1,238)	**Zip codes in NO_2 analysis** (n=95)	**P-value** [a]
nZEV per 1,000 population			
2013	1.4 (2.0)	0.9 (1.2)	<0.001
2014	2.9 (3.6)	1.9 (2.5)	<0.001
2015	4.4 (5.4)	2.8 (3.7)	<0.001
2016	6.1 (7.1)	4.2 (5.1)	<0.001
2017	8.7 (9.5)	6.0 6.6)	<0.001
2018	12.1 (12.9)	8.2 (8.5)	<0.001
2019	14.7 (14.7)	10.4 (10.0)	<0.001
Age-adjusted asthma ED visit rate per 10,000 population			
2013	49.5 (30.5)	61.6 (36.4)	0.001
2014	49.7 (30.6)	61.5 (36.6)	0.001
2015	51.4 (31.9)	63.7 (39.6)	0.002
2016	46.3 (29.6)	56.9 (35.4)	0.003
2017	48.6 (34.8)	57.7 (36.1)	0.013
2018	43.3 (28.0)	51.9 (30.8)	0.005
2019	43.0 (27.5)	51.6 (31.0)	0.006

[a] P-value from t-tests comparing differences in characteristics between zip codes with and without NO_2 monitor data.

Supplemental Table 2. Adjusted change in annual average nitrogen dioxide (NO_2) concentration (ppb) associated with a within-zip code increase of 20 zero-emissions vehicles (ZEVs) per 1,000 population, from primary model and various sensitivity analyses.

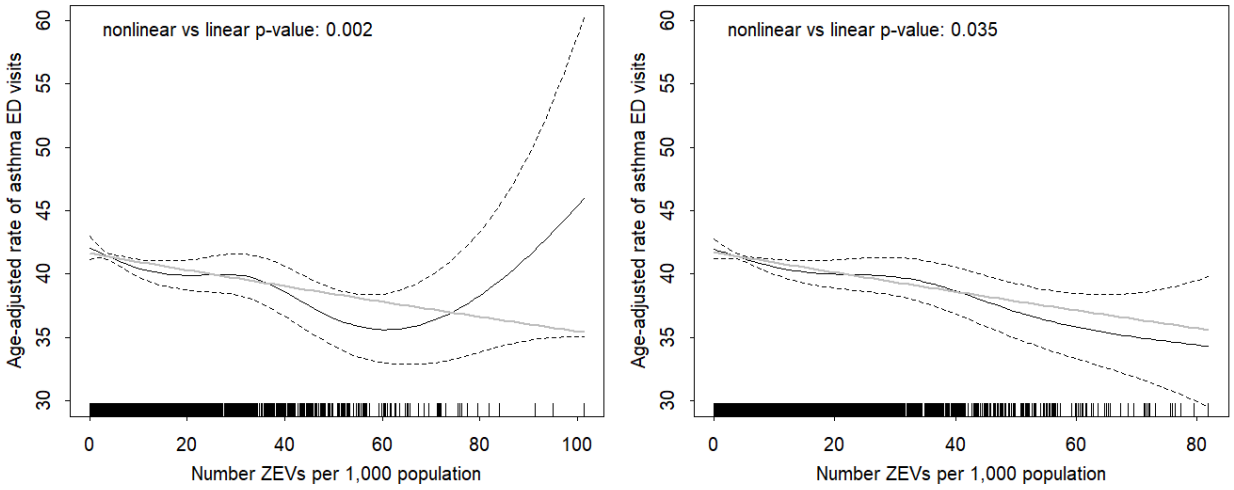
Model	Estimate	95% CI	p-value	N obs
Primary model [a]	-0.41	(-1.12, 0.29)	0.252	629
Fixed effect for monitoring site; no random effects	-0.84	(-1.41, -0.28)	0.003	629
Adjustment for % poverty instead of % bachelor's degree	-0.71	(-1.34, -0.09)	0.025	629
Adjustment for median household income instead of % bachelor's degree	-0.62	(-1.28, 0.04)	0.064	629
Adjustment for % high school degree instead of % bachelor's degree	-0.54	(-1.19, 0.12)	0.110	629
No random slope on year	-0.78	(-1.34, -0.22)	0.007	629
No adjustment for % bachelor's degree	-0.92	(-1.51, -0.33)	0.002	629
No adjustments for year	-3.28	(-3.72, -2.85)	<0.001	629
No adjustments for year or % bachelor's degree	-3.31	(-3.74, -2.87)	<0.001	629
Include only annual averages based on > 75% complete data	-0.27	(-1.03, 0.48)	0.480	599
Include additional years of data: 2013-2021	-0.98	(-1.51, -0.45)	<0.001	804
Include additional year of data: 2013-2019 and 2021 (exclude 2020)	-0.91	(-1.46, -0.36)	0.001	716
Include additional years of data and only > 75% complete data: 2013-2021	-0.70	(-1.28, -0.12)	0.019	768
Include additional year of data and only > 75% complete data: 2013-2019 and 2021 (exclude 2020)	-0.64	(-1.25, -0.02)	0.041	681

[a] Primary model estimated using a linear mixed effects model adjusted for % bachelor's degree, calendar year (linear and quadratic effect, centered at 2013), with random intercepts for zip code and site within zip cope, and a zip code-level random slope on the linear effect of year.

Supplemental Table 3. Adjusted percent difference in age-adjusted asthma-related emergency department (ED) visits associated with a within-zip code increase of 20 zero-emissions vehicles (ZEVs) per 1,000 population, from primary model and various sensitivity analyses.

Model	Estimate	95% CI	p-value
Primary model [a]	-3.2	(-5.4, -0.9)	0.006
Fixed effect for zip code; no random effects	-2.0	(-3.8, -0.2)	0.029
Adjustment for % poverty instead of % bachelor's degree	-8.2	(-10.2, -6.1)	0.000
Adjustment for median household income instead of % bachelor's degree	-3.0	(-5.2, -0.7)	0.010
Adjustment for % high school degree instead of % bachelor's degree	-7.8	(-9.9, -5.7)	0.000
No random slopes on year terms	-2.8	(-4.6, -1.1)	0.002
Additional random slope on nZEV	-2.9	(-5.5, -0.2)	0.033
No adjustment for % bachelor's degree	-13.0	(-14.9, -11.1)	0.000
No adjustments for year	-14.0	(-15.1, -12.8)	0.000
No adjustments for year or % bachelor's degree	-15.9	(-17, -14.8)	0.000
Include only data from 2016-2019 (only ICD-10 codes)	-6.9	(-9.8, -3.8)	0.000

[a] Primary model estimated using a linear mixed effects model adjusted for % bachelor's degree, calendar year (linear and quadratic effect, centered at 2013), with random intercepts for zip code, and a zip code-level random slope on the linear and quadratic effects of year.



Supplemental Figure 1. Adjusted association between number of zero-emissions vehicles (nZEVs) per 1,000 population and age-adjusted rate of asthma emergency department (ED) visits per 10,000 population with (left) all data and (right) excluding 4 observations with nZEV >82. Gray lines indicate the estimated association from an analogous linear mixed model. Predictions plotted are for a typical zip code, average educational attainment, year held constant at 2016. From the nonlinear model using all data, the estimated change in the age-adjusted rate of asthma ED visits associated with a within-zip code increase of 20 ZEV per 1,000 population was: -5.1% (95% CI: -5.1, -0.4) for an increase from 0 to 20 ZEVs per 1,000 and -8.6% (95% CI: -12.6, -4.4) for an increase from 30 to 50 ZEVs per 1,000.