CC16 levels into adult life are associated with nitrogen dioxide exposure at birth

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ONLINE DATA SUPPLEMENT

Table E1. Predictor variables used in land use regression model development. Full references for data sources provided at end of supplemental file.

Predictor	Data Source(s)	Specification (Units)	Spatial Buffer Sizes (m)
Distance to nearest road	Pima County GIS (1)	Distance to center of the road (m)	NA
Distance to nearest rail line	Pima County GIS (2)	Distance of object to rail (m)	NA
Distance to nearest bus route	Pima County GIS (3)	Distance of object to bus route (m)	NA
Distance to nearest airport	Pima County GIS (4)	Distance of object to airport (m)	NA
Distance to nearest mine	Pima County GIS (5)	Distance of object to mine (m)	NA
Traffic intensity nearest street	Pima County GIS (1), Pima Association of Governments (6)	Motor vehicles per day (vehicles)	NA
Traffic intensity buffers	Pima County GIS (1), Pima Association of Governments (6)	Motor vehicles per day in buffers (vehicles)	25, 50, 100, 300, 500, 1000
Distance to nearby major road*	Pima County GIS (1), Pima Association of Governments (6)	Distance to center of a major road (m)	NA
Traffic intensity on nearest major road	Pima County GIS (1), Pima Association of Governments (6)	Motor vehicles per day in buffers	NA
Population density	1990 US Decennial Census (7)	Population density in buffers (persons/m^2)	100, 300, 500, 1000, 5000
Household density	1990 US Decennial Census (7)	Household density in buffers (households/m^2)	100, 300, 500, 1000, 5000
Land use	1992 National Land Use Cover Database (8)	Land use in buffers (e.g. residential land, industry, urban green) (m^2)	100, 300, 500, 1000, 5000
Elevation	US Geological Survey	Elevation above sea level (m)	NA

NOTES: *Major road: >5,000 vehicles/day

Table E2. Association between participant characteristics and NO_2 exposure based upon participant's home address at enrollment and at age 6, respectively.

	Enrollment				Age 6			
	Median	Range	β	p-value	Median	Range	β	p-value
Gender								
Male	10.84	4.61-21.80	ref		10.49	2.73-20.12	ref	
Female	10.94	4.18-27.30	0.01	0.87	10.83	2.73-19.18	0.02	0.64
Child Ethnicity/Race								
Non-Hispanic White	11.05	4.37-27.30	ref		10.03	2.78-19.05	ref	
Any Hispanic	10.97	4.82-20.40	-0.01	0.80	11.62	2.73-20.12	0.14	<0.01
Any Non-Hispanic Black	11.88	4.83-18.35	0.07	0.57	11.85	5.12-18.78	0.25	0.06
Other	9.13	4.18-17.60	-0.23	0.01	10.01	4.75-19.18	0.03	0.75
Maternal Age at Enrollment								
<20	11.60	4.61-18.71	ref		13.35	5.94-18.31	ref	
20-25	10.88	5.03-21.80	-0.12	0.23	10.84	2.73-20.12	-0.31	<0.01
26-30	10.98	4.82-27.30	-0.12	0.25	10.23	3.18-18.83	-0.30	<0.01
>30	10.36	4.18-24.75	-0.16	0.13	10.36	2.95-19.18	-0.33	<0.01
Maternal Education at Enrollment								
> 12 years	10.79	4.18-27.30	ref		10.26	2.78-19.18	ref	
≤ 12 years	10.99	4.61-20.83	0.00	0.99	11.22	2.73-20.12	0.12	0.01
Maternal Smoking at Enrollment								
No	10.88	4.18-27.30	ref		10.78	2.73-19.18	ref	
Yes	11.06	4.82-23.58	0.02	0.76	10.46	4.89-20.12	-0.00	0.98

Medians and ranges are reported for the raw NO_2 values. Beta coefficients and p values for differences are per interquartile range of NO_2. Only includes participants with NO_2 and at least one CC16 measurement.

Table E3. Characteristics of participants according to inclusion in the analysis. Participants included had at least one CC16 measurement between age 6-32 years and their NO_2 exposure at enrollment or age 6 could be determined.

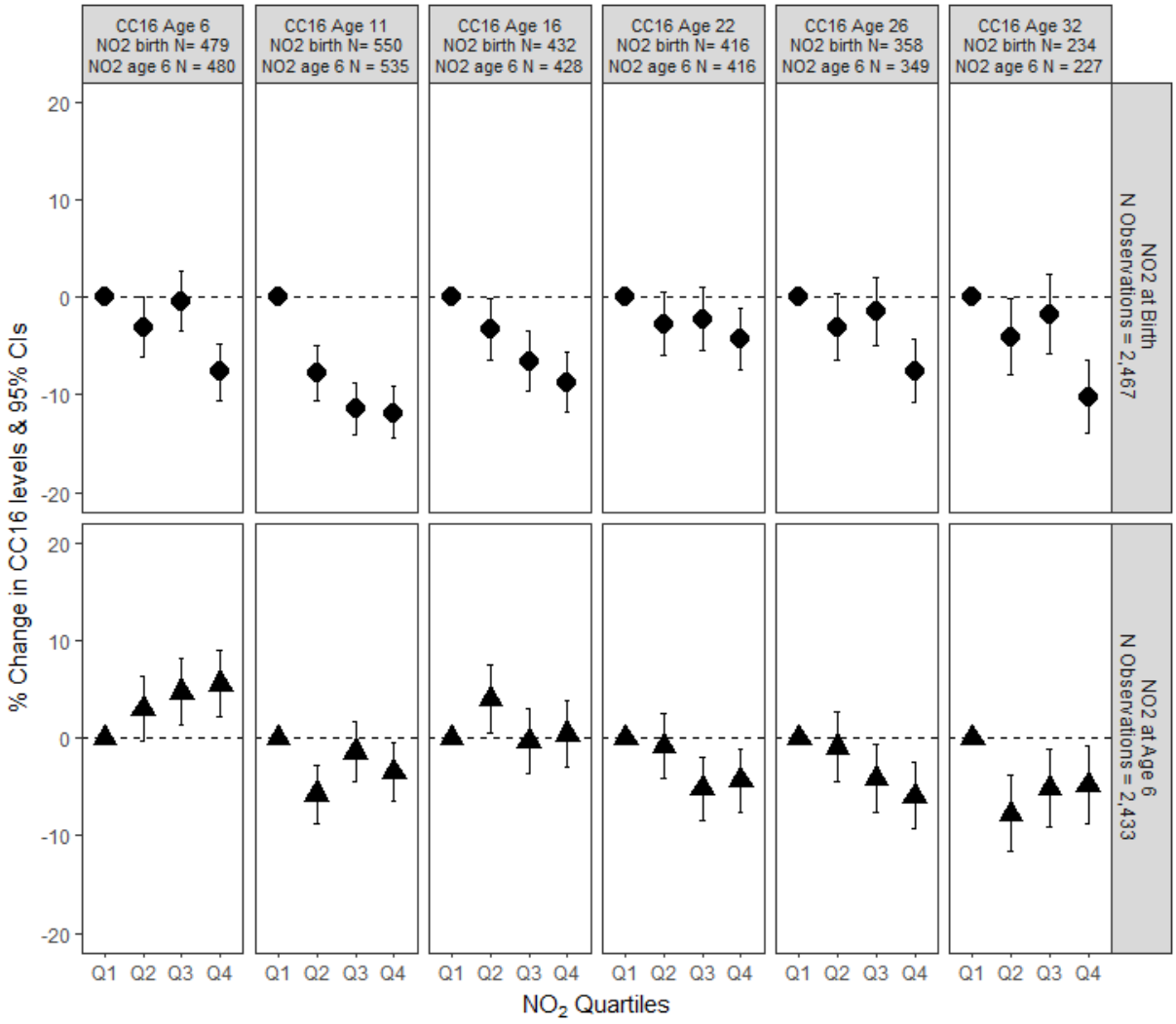
	Not Included		Included		χ^2	p-value
	N=469	%	N=777	%		
NO_2 Enrollment Exposure Quartile*					2.43	0.49
1	97	24.0	187	25.5		
2	97	24.0	187	25.5		
3	112	27.7	172	23.5		
4	99	24.4	186	25.4		
NO_2 Age 6 Exposure Quartile†					2.67	0.45
1	28	24.8	174	25.1		
2	25	22.1	176	25.4		
3	25	22.1	176	25.4		
4	35	31.0	167	24.1		
Gender					0.47	0.49
Male	224	47.8	388	49.9		
Female	245	52.2	389	50.1		
Child Ethnicity/Race					38.4	<0.01
Non-Hispanic White	260	55.4	481	61.9		
Any Hispanic	104	22.2	216	27.8		
Any Non-Hispanic Black	21	4.5	26	3.3		
Other	84	17.9	54	6.9		
Maternal Age‡					9.16	0.03
<20	43	9.2	44	5.7		
20-25	154	32.9	228	29.3		
26-30	169	36.1	303	39.0		
>30	12	21.8	202	26.0		
Maternal Education‡					6.68	<0.01
≤ 12 years	175	37.6	219	28.2		
> 12 years	290	62.4	557	71.8		
Maternal Smoking‡					4.55	0.03
Yes	100	21.4	120	15.5		
No	367	78.6	656	84.5		

*These participants are restricted to those with NO_2 measurements at birth and any CC16 value from age 6-32

†These participants are restricted to those with NO_2 measurements at age 6 and any CC16 value from age 6-32

‡All variables at enrollment

Figure E1. Percent change in club cell secretory protein levels at each age in association with nitrogen dioxide exposure at birth and age 6 addresses, respectively. Associations are shown per quartile. Adjusted models include fixed effects for child's race/ethnicity, child's gender, and maternal smoking at enrollment. Participant counts include those with complete covariate, exposure and outcome data. Percent change was calculated from the b coefficients according to methods for log-transformed outcome variables (10). CC16=club cell secretory protein; CI=confidence interval; NO_2=nitrogen dioxide.



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