**Table S1.** Study to Explore Early Development catchment areas

|  |  |
| --- | --- |
| **Study Site** | **Counties** |
| **California**  San Francisco Bay Area | Alameda, Santa Clara |
| **Colorado**  Denver | Denver, Adams, Arapahoe, Jefferson, Broomfield, Douglas, Boulder |
| **Georgia**  Metro Atlanta | Metropolitan Atlanta (Clayton, Cobb, DeKalb, Fulton, Gwinnett) |
| **Maryland**  NE MD | Baltimore City, Anne Arundel, Baltimore, Carroll, Cecil, Harford, Howard, Montgomery, Prince George |
| **North Carolina**  Central NC | Alamance, Chatham, Davidson, Durham, Forsyth, Guilford, Johnston, Orange, Randolph, Wake |
| **Pennsylvania**  Philadelphia | Bucks, Chester, Delaware, Montgomery, Philadelphia |

**Table S2.** Description of included neighborhood level census indicators, from the

2000 U.S. Census

|  |  |  |
| --- | --- | --- |
| **Neighborhood-level Socioeconomic domain** | **Census indicator** | **Description** |
| Education | %<High school education | Percentage of males and females with less than a high school education |
| Employment | %Unemployment | Percentage of males and females unemployed |
| Housing | %Crowding | Percentage of housing units with more than one occupant per room |
| Occupation | %Management | Percentage of males not in management and professional occupations |
| Poverty | %Poverty | Percentage of households in poverty |
|  | %Female headed household | Percentage of female headed households with dependent children |
|  | %Income <$30,000 | Percentage of households earning less than $30,000 per year |
|  | %Public assistance | Percentage of households on public assistance |

**Table S3.** PM2.5 (µg/m3) exposure distribution [mean (interquartile range)] by Study to Explore Early Development study site and developmental windows, among controls only.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **All sites**  Mean (IQR) | **California**  Mean (IQR) | **Colorado**  Mean (IQR) | **Georgia**  Mean (IQR) | **Maryland**  Mean (IQR) | **North Carolina** Mean (IQR) | **Pennsylvania**  Mean (IQR) |
| Entire pregnancy | 12.7 (3.9) | 11.6 (1.8) | 9.0 (1.6) | 15.5 (1.7) | 14.8 (1.8) | 13.0 (1.5) | 12.9 (1.1) |
| First year of life | 12.5 (3.9) | 11.3 (1.1) | 8.7 (1.5) | 15.5 (0.8) | 14.5 (1.6) | 13.1 (0.9) | 13.0 (0.8) |

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Low neighborhood deprivation** | **Moderate neighborhood deprivation** | **High neighborhood deprivation** |
| All sites combined | 38.8 | 33.4 | 27.9 |
| California | 30.7 | 42.2 | 27.2 |
| Colorado | 45.1 | 33.3 | 21.6 |
| Georgia | 41.7 | 27.8 | 30.5 |
| Maryland | 38.7 | 33.8 | 27.5 |
| North Carolina | 38.7 | 39.4 | 21.9 |
| Pennsylvania | 37.6 | 23.3 | 39.1 |

**Table S4.** Distribution (%) of neighborhood deprivation by SEED study sites

**Table S5.** Mean (SD) of U.S. census indicators for Study to Explore Early Development study participants

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | CA | CO | GA | MD | NC | PA |
| % Poverty | 5.7 (5.6) | 4.9 (5.7) | 7.2 (9.1) | 5.7 (7.3) | 5.5 (6.0) | 9.9 (12.7) |
| % Public assistance | 3.3 (3.1) | 1.9 (1.9) | 2.2 (3.5) | 2.2 (3.4) | 1.7 (1.9) | 4.9 (6.9) |
| % Unemployment | 2.9 (1.7) | 2.5 (1.6) | 3.4 (2.5) | 2.6 (2.1) | 2.5 (2.3) | 4.1 (3.5) |
| % <High school education | 15.8 (11.1) | 12.5 (12.9) | 13.6 (11.1) | 15.3 (11.3) | 13.2 (9.5) | 18.3 (13.9) |
| % Crowding | 12.9 (10.6) | 4.8 (6.0) | 5.3 (5.1) | 2.1 (1.9) | 2.8 (3.5) | 3.1 (3.6) |
| % Income <$30,000 | 18.7 (11.2) | 20.7 (14.5) | 23.6 (15.4) | 25.1 (16.0) | 25.8 (13.7) | 31.5 (20.2) |
| % Female headed household | 6.0 (3.3) | 6.2 (3.0) | 8.2 (6.6) | 7.3 (5.2) | 6.4 (4.2) | 8.1 (6.9) |
| % Management occupation | 75.0 (10.5) | 79.6 (9.2) | 78.5 (10.0) | 75.6 (11.7) | 77.7 (9.7) | 81.3 (9.9) |
|  |  |  |  |  |  |  |
| Neighborhood deprivation index | -0.20 (0.7) | -0.35 (0.7) | -0.18 (0.9) | -0.30 (0.8) | -0.34 (0.7) | 0.14 (1.3) |

*%Poverty*: Percentage of households in poverty; *%Public assistance*: Percentage of households on public assistance; *%Unemployment*: Percentage of males and females unemployed; *%<HS education*: Percentage of males and females with less than a high school education; %Crowding: Percentage of housing units with more than one occupant per room; *%Income <30K*: Percentage of households earning less than $30,000 per year; *%Female headed household*: Percentage of female headed households with dependent children; *%Management occupation*: Percentage of males not in management and professional occupations.

**Table S6**. Adjusteda odds ratios and 95% confidence intervals for continuousb

PM2.5 exposure and ASD, by neighborhood deprivation level

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Exposure** | **ASD (N)** | **Controls (N)** | **Stratified ORs (95% CI)** | **LRT**  **p-value** |
| **Pregnancy PM2.5** |  |  |  |  |
| Low deprivation | 252 | 427 | 0.98 (0.58, 1.66) |  |
| Moderate deprivation | 235 | 269 | 0.97 (0.55, 1.71) |  |
| High deprivation | 187 | 159 | 1.16 (0.63, 2.16) | 0.79 |
| **First year of life PM2.5** |  |  |  |  |
| Low deprivation | 252 | 427 | 1.83 (0.90, 3.70) |  |
| Moderate deprivation | 235 | 269 | 1.88 (0.83, 4.25) |  |
| High deprivation | 187 | 159 | 2.45 (1.08, 5.56) | 0.57 |

Abbreviations: ASD, autism spectrum disorder; CI, confidence interval; LRT,

likelihood ratio test; OR, odds ratio; PM2.5, particulate matter <2.5 µm

a Models are adjusted for study site, year of birth, maternal education, maternal

race/ethnicity, maternal age, and maternal smoking

b Results are reported per 5-µg/m3 increases