

U.S. Children Exposed to Air Pollution and Household Lead Face Higher Risk of Incarceration and Lower Incomes in Adulthood

Children who grew up in neighborhoods with higher levels of air pollution and risk of household lead exposure had lower incomes and higher rates of incarceration as adults than their unexposed peers, according to a new study by Robert Manduca of the University of Michigan and Robert J. Sampson of Harvard University.

High levels of air pollution, which also predicted a greater likelihood of teen childbearing, were disproportionately found in Black and Latino neighborhoods. In their analysis, the researchers controlled for the effects of neighborhood poverty and demographics. Their findings suggest that efforts to clean up neighborhood pollution and household lead could increase social mobility and decrease inequality.

Addressing “traffic pollution will likely require region-wide changes to vehicle standards or commuting methods,” suggest Manduca and Sampson, while the risk of household lead exposure could be lowered “by targeted rehabilitations of dilapidated buildings and stricter code enforcement by city government of rental properties.”

The researchers used Opportunity Atlas data, which combines Internal Revenue Service information and U.S. Census data for children born in the United States between 1978 and 1983. They combined this dataset, which links the neighborhoods where these children grew up in the 1990s to economic and social outcomes 20 years later, with estimates of four common air pollutants and risk of lead exposure from housing in the year 2000, from the Texas A&M Transportation Institute and the Washington State Department of Health respectively.

In statistical models predicting earnings between ages 31 and 37, one standard deviation increase in lead exposure risk (from the 50th percentile to the 84th percentile in this sample) was associated with a \$700 decrease in annual income for Black children after controlling for neighborhood poverty rate, average education level, and demographics.

The same increase in lead exposure was associated with a 5% increase in the likelihood of incarceration for Black boys, and a 1.7% increase in the likelihood of teen childbearing for Black girls. A comparable increase in air pollution predicted a \$500 income drop, a 7% increase in likelihood of incarceration, and a 3.4% increase in teen motherhood.

While the impacts of air pollution and household lead exposure were present for white, Black, and Latino children, white children were much less exposed to either type of toxin than Black or Latino children. This suggests that differential exposure to toxic environments during childhood could be a contributing factor in the persistence of racial inequality among adults.

Journal article: Robert Manduca and Robert J. Sampson, "Childhood Exposure to Polluted Neighborhood Environments and Intergenerational Income Mobility, Teenage Birth, and Incarceration in the USA," *Population and Environment* 42, no. 4 (2021).