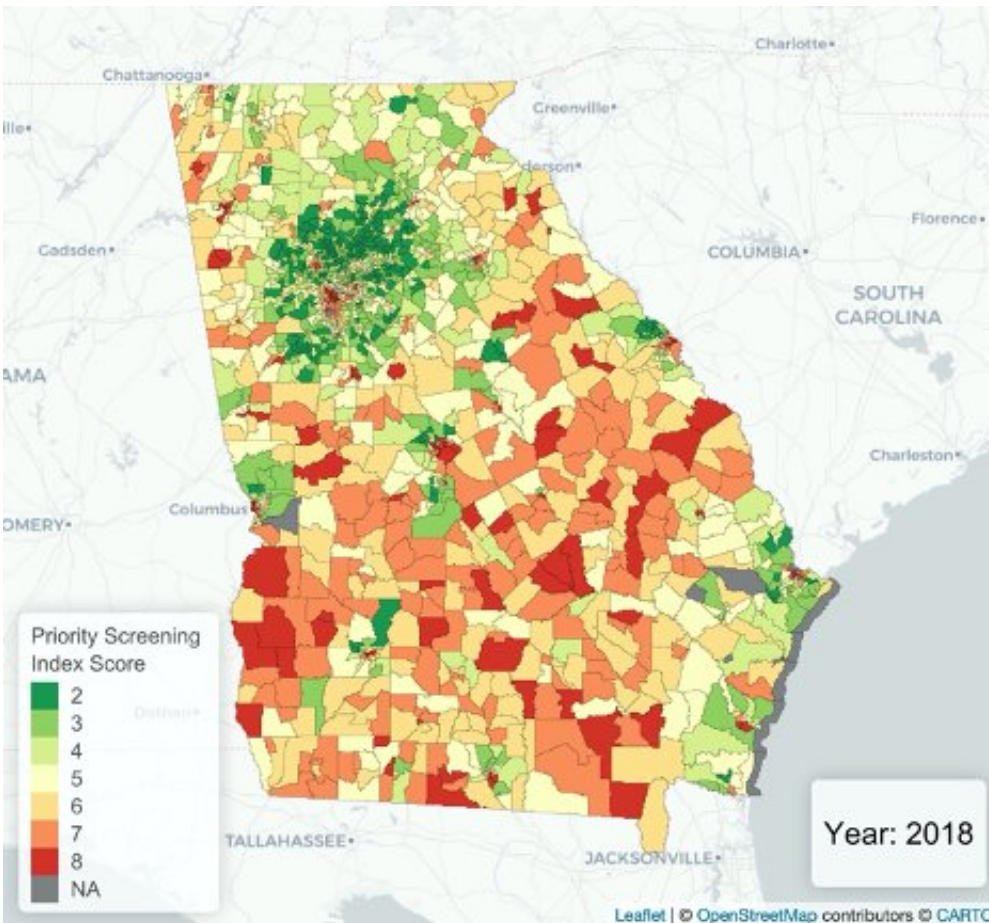


# New lead screening method zooms in on highest-risk areas in Georgia

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Screening index scores for low-level lead exposure in Georgia. Click here to see an interactive version of the map:

[http://scholarblogs.emory.edu/esaikawa/files/2020/10/GA\\_map.html](http://scholarblogs.emory.edu/esaikawa/files/2020/10/GA_map.html) Credit:

Saikawa Lab, Emory University

While many people think of lead poisoning as a problem of the past, chronic exposure still occurs in some communities that may be missed in limited screening programs for children's blood lead levels. Now researchers at Emory University have developed a more precise screening index, illustrated with a map, which provides a fine-grain view of areas where children are most at risk for low-level lead exposure in the city of Atlanta and throughout the state of Georgia.

*Scientific Reports* published their new method, including analyses that tested and showed its efficacy, using [historical data](#).

The new screening index is based on established risk factors for lead exposure, including poverty and housing built before 1950. The index pinpointed 18 highest-priority census tracts in metro Atlanta, encompassing 2,715 children under the age of six—or 1.7 percent of all children that age in greater Atlanta.

These highest-priority areas include the historically black neighborhoods of English Avenue and Vine City, where Emory researchers had previously identified elevated levels of lead in the soil of some yards and vacant lots.

"As we move forward into an age when acute [lead poisoning](#) is rare, we need better tools to monitor for chronic, long-term exposure to lead," says Emory graduate Samantha Distler, first author of the paper. "We developed an interactive map that can be used by physicians and other [health officials](#), and even by individuals who want to check their own children's risk levels. You can easily zoom in to find an exact location, so there's less guess work involved in assessing what is a high-risk area."

The method could be applied to any area in the United States, she adds.

Distler led the work as an Emory undergraduate majoring in quantitative

sciences on the neuroscience and behavioral biology track. She is now a graduate student of epidemiology at the University of Michigan School of Public Health.

"Lead is a toxicant that is particularly dangerous to children and their developing brains," Distler says. "Even low blood lead levels are associated with neurological deficits in children."

"One of the biggest problems concerning lead is that many people don't know if their children are being exposed," says Eri Saikawa, senior author of the study and associate professor in Emory's Department of Environmental Sciences and Rollins School of Public Health. "Detecting lead exposure as early as possible is very important so preventative measures can be taken. The easiest way to do that is to screen the blood."

In 2018, the Saikawa lab collaborated with members of Atlanta's Historic Westside Gardens to test urban soil on Atlanta's Westside for contaminants. That project uncovered high levels of heavy metal and metalloids in some yards, and even some industrial waste known as slag. The project led to an investigation by the U.S. Environmental Protection Agency, which in 2019 began decontaminating properties in the area by removing and replacing soil.

In addition to neurological deficits, lead exposure is associated with immunological and endocrine effects and cardiovascular disease. Decades ago, federal regulations reduced lead in paint and gasoline and other common exposure sources. The resulting drop in children's blood lead levels in the United States is considered one of the greatest public health achievements in the country's history.

Many people remain unaware, however, that lead persists in the environment. "It can linger for a really long time in everything from soil to water," Distler says. "That puts some people at risk for chronic

exposures to low levels over a long time."

The Centers for Disease Control and Prevention (CDC) estimates that at least four million households in the United States have children living in them who are being exposed to high levels of lead. And about half a million of those children aged one to five years have blood lead levels above five micrograms per deciliter, the level at which the CDC recommends initiating public health action.

Despite this alarming statistic, many children in higher-risk areas are not screened for blood lead levels. In Georgia, data from the period 2011 to 2018 show that the proportion in various ZIP code tabulation areas who have been tested range from 1 percent to 67 percent, with a median of 13 percent.

The Emory researchers realized that one problem may be that health officials focus screening efforts on a county-wide basis, rather than zeroing in on the highest-risk neighborhoods within those counties.

In 2009, a team led by researchers at the CDC developed and published a priority screen index for Atlanta neighborhoods based on housing age and percentage of residents enrolled in Georgia's Special Supplemental Nutrition Program for Women, Infants and Children (WIC), a proxy for poverty.

For the current paper, the Emory researchers built on the efforts of the 2009 paper, drilling down from neighborhoods to more precise U.S. Census Bureau tracts. Data from the American Community Survey was used to assess the relative level of poverty and proportion of homes built before 1950.

A priority screening index, ranging from two to eight, was applied to the census tracts. The areas of highest relative poverty and proportion of

homes built before 1950 received the highest score. The researchers applied this index to census tracts across the state of Georgia and to the entire United States to identify tracts that consistently have the highest priority screening index values.

"The visualizations of our priority screening index that we've created using interactive maps can empower physicians and health officials to better target children at high risk for lead exposure," Distler says. "We hope our work will help lead to improved policies and actions to reach [children](#) who are most at risk for [lead exposure](#) and to improve their lives—not just in Georgia but throughout the United States."

**More information:** Samantha Distler et al, A new screening index to better target low-level lead exposure in Atlanta, Georgia, *Scientific Reports* (2020). [DOI: 10.1038/s41598-020-75000-0](https://doi.org/10.1038/s41598-020-75000-0)

Provided by Emory University

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