

THE IMPACT OF ENVIRONMENTAL TOXINS ON MATERNAL & CHILD HEALTH

IN DURHAM, NORTH CAROLINA

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Objective: Investigate factors of exposure or risk of exposure to environmental toxins on maternal and child health outcomes in Durham, North Carolina and strategize actionable solutions.

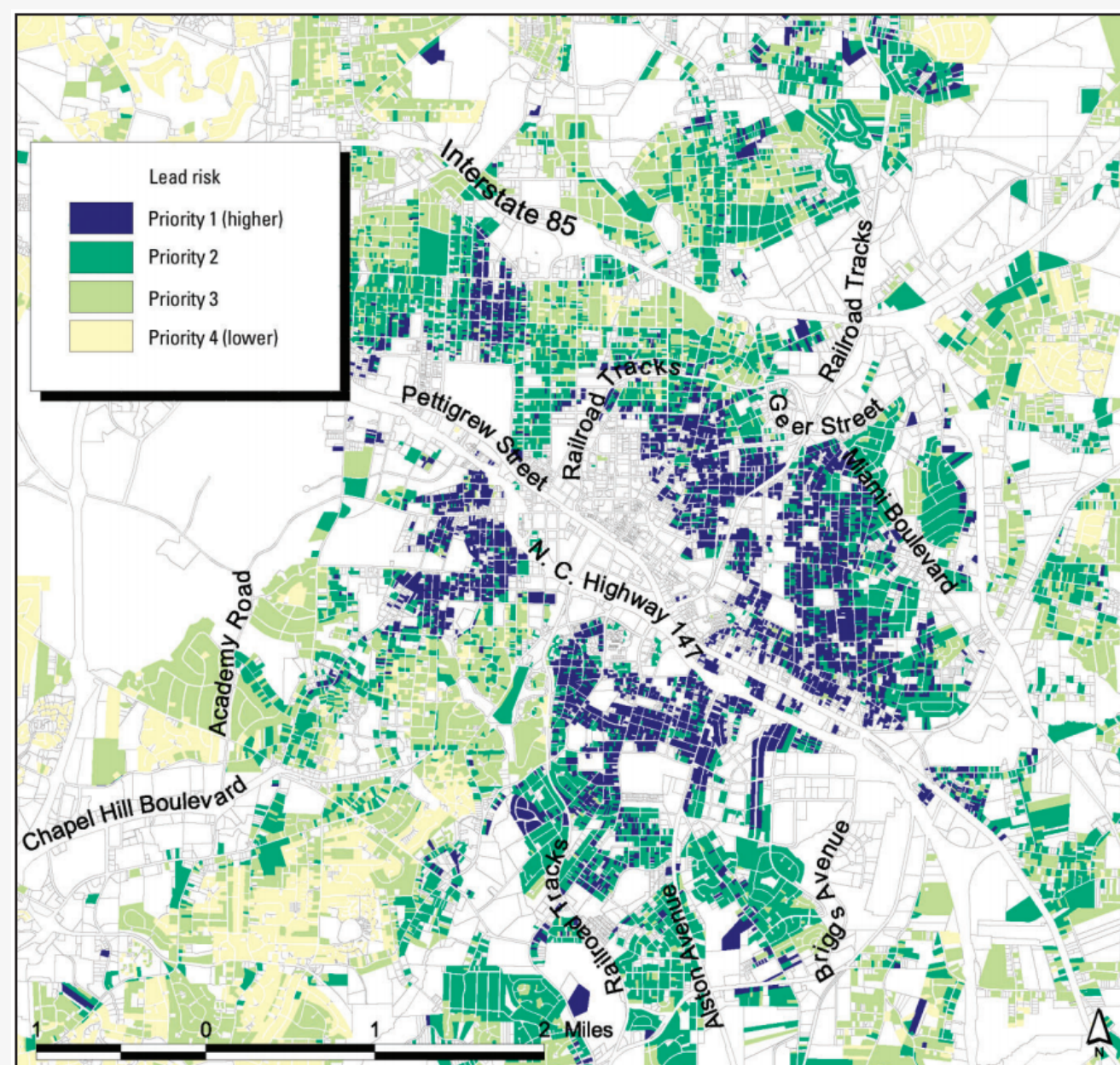
BACKGROUND AND SIGNIFICANCE

Previous epidemiological studies in Durham have identified geographic clustering of elevated levels of exposure to environmental toxins, such as lead and cadmium, among pregnant women. Communities of color and low-income communities experience a higher frequency and magnitude of exposure to harmful environmental hazards such as pollutants, pesticides, and carcinogens. Pregnant women who are exposed to elevated levels of harmful toxins have an increased risk of miscarriage, premature birth, birth defects, and low birth-weight deliveries.



RESEARCH METHODS

A social-ecological model was used to determine the factors involved in the complex relationship between environmental toxins and maternal health at the individual, interpersonal, community, and institutional level. Data were collected through an electronic survey and ethnographic observations of Durham community meetings in identified high-risk neighborhoods. To construct the individual and interpersonal levels, data from the survey measured awareness and attitudes regarding environmental toxins and the relationships these toxins may have on the health of individuals. To take part in the survey, participants were required to be over the age of 18 and residents of Durham. In November 2019, the survey was distributed electronically to 16 residents and was completed in approximately 10 minutes. The community and institutional levels of the social-ecological model were constructed from ethnographic observations and a review of current research and literature. An approved ethics waiver was obtained from North Carolina State University's Institutional Review Board for this research.



Lead risk priorities mapped for Durham, NC, 2002

Miranda, Marie Lynn, Dana C. Dolinoy, and M. Alicia Overstreet. "Mapping for Prevention: GIS Models for Directing Childhood Lead Poisoning Prevention Programs." *Environmental Health Perspectives* 110.9 (2002): 947-53.

THE THIRD GUIDING PRINCIPLE OF REPRODUCTIVE JUSTICE IS THE RIGHT TO PARENT CHILDREN IN SAFE AND HEALTHY ENVIRONMENTS.

WOMEN OF AFRICAN DESCENT FOR REPRODUCTIVE JUSTICE, 1994

FINDINGS



INDIVIDUAL

- Only 20% of survey respondents reported being well informed about environmental toxins
- 47% of respondents were concerned about their exposure to environmental toxins
- Only 19% of survey participants report having previous blood test for environmental toxins
- 44% of survey participants reported practicing preventive cleaning habits more than once a week

INTERPERSONAL

- 50% of homes in areas with high-risk for exposure are female-headed households with children
- 31% of survey respondents learned about environmental toxins from a friend or family member

COMMUNITY

- 73% of residents living in areas with highest risk of exposure are Black
- Poverty rates in high-risk areas range from 31% - 50%
- Areas with geographic clustering of high-risk levels overlap with housing units owned by Durham Housing Authority

INSTITUTIONAL

- Pregnant women in NC with two consecutive blood lead levels exceeding the blood lead action level (BLAL) are eligible for a free environmental assessment
- NC requires routine blood lead testing for children at 12 months and 24 months of age who live in high-risk areas; however, routine testing is not mandated for pregnant women or women planning to become pregnant living in high-risk areas

POLICY RECOMMENDATIONS

1) IMPLEMENT PUBLIC HEALTH CAMPAIGNS TARGETED FOR RESIDENTS IN HIGH-RISK COMMUNITIES IN DURHAM, NC

Certain routines and individual behaviors may reduce the risk of exposure to harmful environmental toxins in residential areas. To increase the awareness of these preventative practices among residents living in high-risk areas in Durham, the Durham Public Health Department in partnership with the Durham Housing Authority (DHA) should lead a robust public health campaign utilizing social media and print marketing materials, specifically adapted to reach individuals and families living in the high-risk areas. Educational materials sharing the symptoms of exposure to these toxins and how to protect their health and their family's health should be provided directly to residents living in DHA communities. Targeted approaches may include distributing electronic information via zip-code specific ads on social media, email, internet browsers, as well as the physical mailing of posters, brochures, and pamphlets to residents. Posters may also be displayed within commercial areas surrounding the high-risk areas in Durham (e.g., the impact exposure may have on pregnant or parenting women, newborn or developing children).

2) ENCOURAGE HEALTH-CARE PROVIDERS TO RECOMMEND BLOOD-TESTING FOR PREGNANT WOMEN LIVING IN HIGH-RISK AREAS IN DURHAM, NC

Identical blood lead levels in pregnant women are passed along to their developing baby as lead freely passes through the placenta. There is no safe blood lead level for children. According to the CDC, even low levels of lead in blood have been shown to affect IQ, ability to pay attention, and academic achievement. The CDC recommends universal blood lead level testing on all children below 72 months of age. In NC, children living in high-risk zip code areas are required to undergo blood lead level testing. However, universal blood testing for pregnant women is not recommended by the CDC. Instead, health care providers for pregnant women conduct a question-based assessment to determine whether blood lead testing is required. Identifying and abating the negative impacts of potential lead exposure early on during pregnancy will protect the mother and the child's health and future lifetime health. Therefore, regardless of responses to the question-based assessment, health care providers should recommend routine blood lead testing for women living in high-risk zip codes in Durham, NC at prenatal appointments.

CONTACT INFORMATION

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