



# Achieving Equal Access to Clean Water: Investigating Systemic Gaps and Solutions



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## Abstract

Although a lack of access to clean water can have a significant negative impact on a community's well-being, lead-exposed water is a problem that disproportionately affects Black and Brown communities in the United States. This paper explores the institutional, environmental, and political obstacles to clean water access in a number of low-resource communities, including Baltimore, Philadelphia, Newark, and Flint, Michigan. With a meta-analysis of earlier studies, we identify key challenges in securing clean water access and highlight significant implications for affected groups. Additionally, we explore variations in access to environmental hazards with statistical data from the State of Michigan's Lead Prevention Program, US Census Bureau, and the US Environmental Protection Agency. Our findings illustrate possible pathways for communities to catalyze political will and resources to address infrastructure and secure equal access to clean water. Additionally, findings aim to inform young people on public health disparities while guiding targeted advocacy supporting equitable community development in US cities facing these urgent clean water access challenges.

## Background

- There is a long legacy of resource deprivation and environmental endangerment in predominantly Black and Brown communities
- Government-sanctioned discrimination concentrated Black, Latino, and marginalized groups in hazardous, divested neighborhoods devoid of protections
- Higher poverty, mortality, and toxic exposure rates for contemporary urban minorities trace directly back to those racist policies
- Discriminatory zoning practices, chronic disinvestment, and austerity measures maintain modern racial disparities despite existing preventative laws
- Superficial funding commitments fail to remedy the ingrained governance problems underlying inequality
- Accountability for past and present decisions must replace surface-level funding responses

## Results

Our study, using data from Michigan's Childhood Lead Poisoning Prevention Program, the US Census Bureau, and the EPA, uncovers significant racial disparities in lead exposure after Flint's water supply changes:

- The gap in average blood lead levels between Black and White toddlers in Flint tripled, with over 9,000 children, mostly from minority communities, exceeding CDC safety limits.
- Statistical modeling shows a strong link between proximity to water pipe breaks and high blood lead levels, especially in high-poverty, predominantly Black and Brown neighborhoods.
- Increased lead exposure is connected to serious, long-lasting health problems that can worsen inequality by harming education, job prospects, and overall well-being.
- Similar patterns of institutional, environmental, and political barriers to clean water access are seen in other low-resource communities like Baltimore, Philadelphia, and Newark.

## Methodology

### Data Source

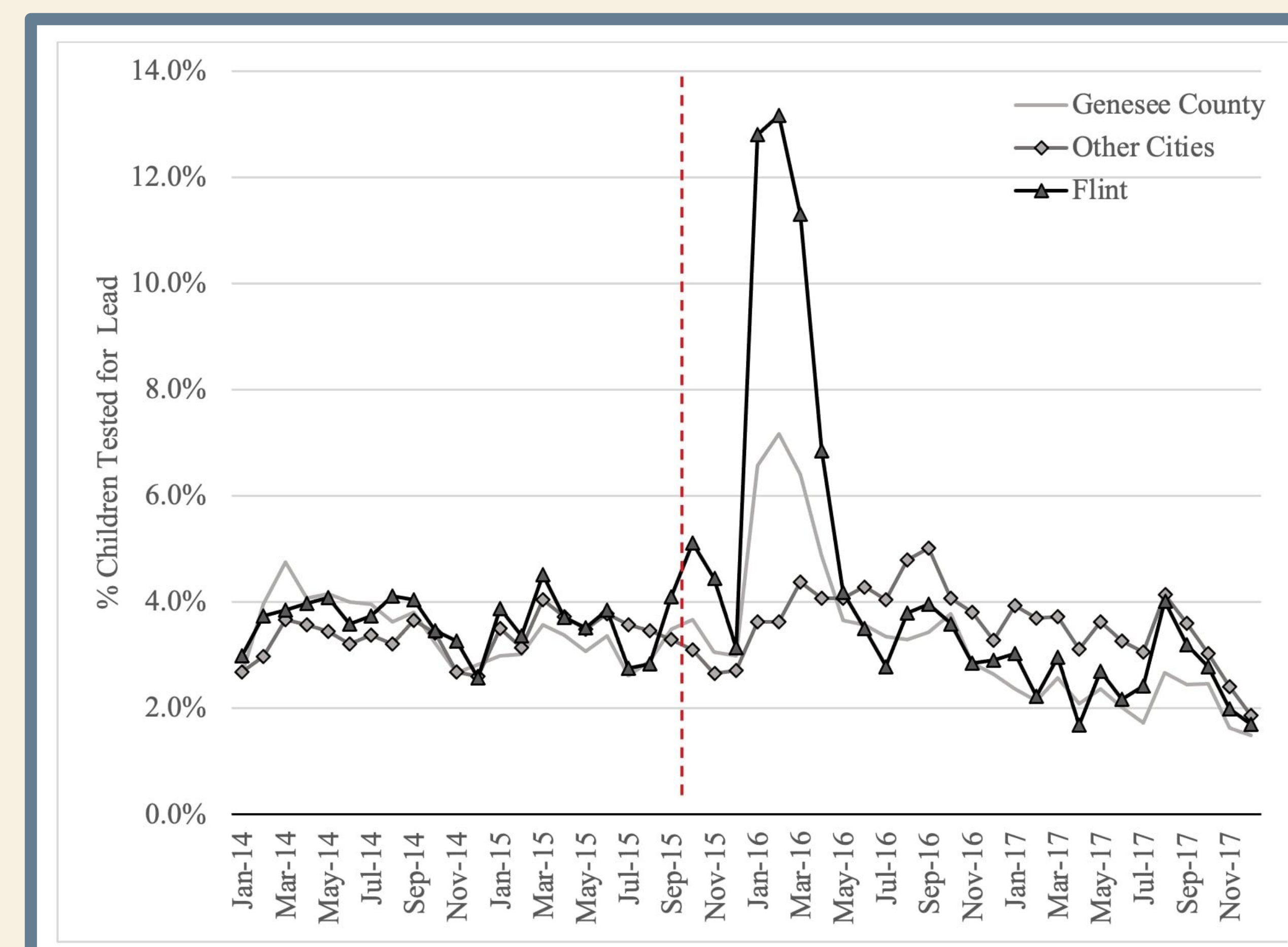
This analysis used health data from the Michigan Department of Health and Human Services Childhood Lead Poisoning Prevention Program. The data covered children ≤6 years old in Flint prior to and following the 2014 water supply changes.

### Key Variables

The outcome was blood lead level (BLL). Independent variables were race, proximity to water pipe breaks, and neighborhood poverty. Covariates included age, gender, and testing month.

### Analysis Plan

Initial analyses visualized racial differences in mean BLLs over time. Multivariable regression modeling then quantified associations between proximity to pipe breaks and BLLs, adjusting for demographic factors. Regressions accounted for census tract clustering and were stratified by time period.



### References

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## What's Next?

The Flint water crisis was ultimately resolved through a combination of immediate interventions and long-term strategies, including switching back to the original water source, providing water filters and bottled water, and replacing lead service lines. The lessons learned from Flint's experience can inform our approach to addressing water infrastructure challenges and environmental injustices in other communities:

**Proactive and preventative measures**, such as regular water testing, infrastructure maintenance, and corrosion control treatment, are crucial. Swift and decisive action is necessary when problems are identified, rather than downplaying or ignoring the concerns of affected residents.

**Community engagement and trust-building** play a critical role in the process of recovery and remediation, as the erosion of public trust can hinder the implementation of effective solutions. Investing in the modernization and maintenance of our water infrastructure, particularly in historically neglected low-income and minority neighborhoods.

**Strengthening regulations and oversight** to hold water utilities accountable and prioritizing community participation in the development and implementation of water equity initiatives are also essential steps in creating a future where everyone has access to clean, safe drinking water.