ADDRESSING HEALTH INEQUITIES IN SOUTH CHATTANOOGA: LEAD CONTAMINATION AND CHILDHOOD LEAD POISONING

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BACKGROUND

Due to the passing of laws in the 1970s that banned lead in paint and gasoline, America has seen a dramatic decrease in high Lead levels found in the air, water, soil, and dust. As a result, notable reductions in blood lead levels (BLLs) in children under the age of six across the United States has occurred. Even with these advances in the reduction of childhood lead poisoning, the occurrence of children with elevated BLL is still very prevalent. In fact, research has shown that there is no safe level of BLL and even low levels of BLL can very well lead to adverse health impacts especially in minority neighborhoods of low socioeconomic status.[1] Many of these instances present environmental injustices related to ethical issues.[2]

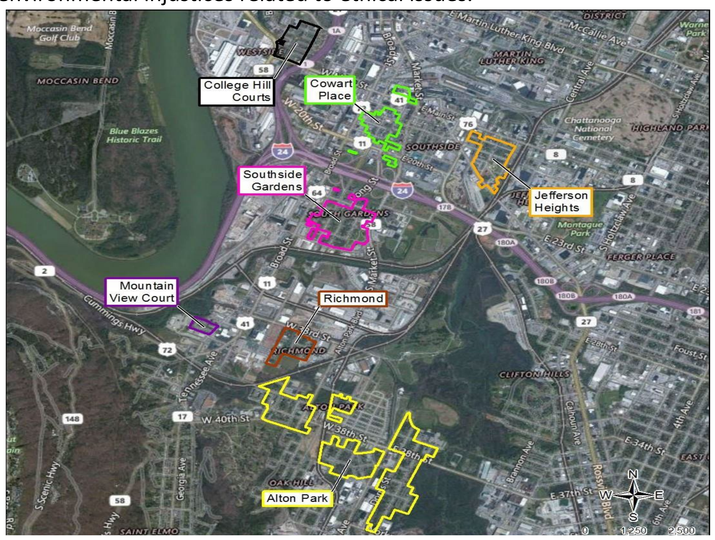

Figure 1. Eight neighborhoods in the Southside Chattanooga Lead Superfund Site.

In 2011, increasingly high elevated blood lead levels (EBLLs) in a South Chattanooga resident was discovered, deeming Chattanooga, Tennessee as an area of focus for childhood lead poisoning.[3] Through extensive testing in the area by the Tennessee Department of Environment and Conservation (TDEC) and the Environmental Protection Agency (EPA), soil lead levels were documented as exceeding the EPA action level. From this, soil sampling in multiple sites resulted in a clean-up process to remove contaminated soil and replacement with clean topsoil at 82 properties. (Figure 1 and Figure 2)[4]. Through this process, efforts were made at the state and federal level to make residents aware of the soil lead contamination through community meetings and mailings however, it is not clear that these efforts increased awareness of the potential of EBLL and childhood lead poisoning.

Figure 2. EPA workers replacing the contaminated soil of affected South Chattanooga properties.[4]

METHODS

The purpose of this study, which will continue through June 2020, is to assess the awareness of residents regarding soil lead hazards and potential for childhood lead poisoning in their neighborhoods and to conduct blood lead testing in children under the age of six. Door-to-door surveys were conducted and the survey tool included questions such as demographics of children in the surveyed homes, previous knowledge about lead contamination in the area, lead testing in children, and more details regarding the property.

The 2019 survey:

- Alton Park Neighborhood (will survey additional neighborhoods in the future)
- Target residences predetermined
- Target residences randomly chosen

Blood lead testing in children has been conducted to date at two events, one specific to Highland Park and one that was open to all neighborhoods.

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RESULTS

A total of 10 children have been tested for blood lead, with 1 child with an elevated blood lead level above the 5 µg/dL from the Highland Park neighborhood. Survey results are shown in Figures 3-6.

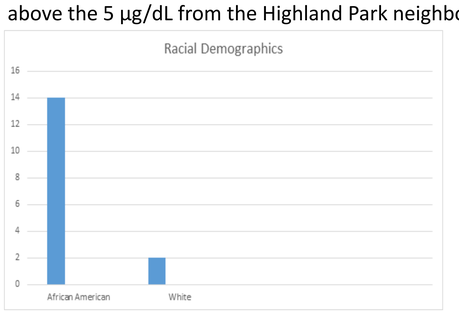

Figure 3. Comparison of the racial makeup of the 2019 survey respondents.

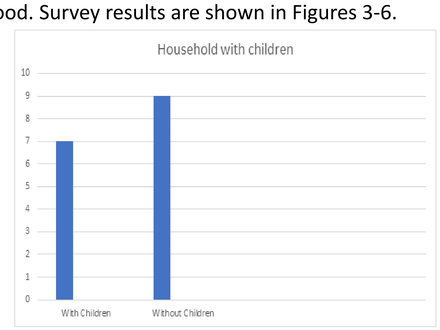

Figure 4. Survey respondents with children under the age of six.

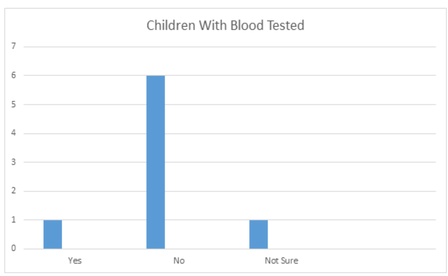

Figure 5. Number of children under the age of six reported as having blood tested for lead.

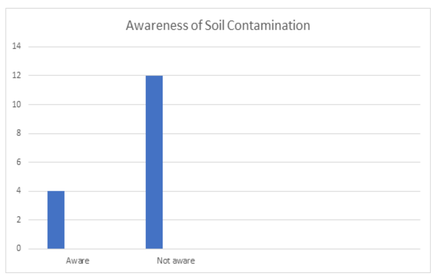

Figure 6. Awareness of soil lead contamination.

DISCUSSION

The 2019 survey respondents were predominantly African American. It is very concerning that in **soil lead contamination awareness levels were so low**. Further, while a majority of the residents did not indicate children were present at their household, only one of the residents with children had their child tested for blood lead poisoning. These measures indicate an environmental health literacy disparity about soil lead contamination which has a greater potential to negatively affect the people who are not as aware of the environmental situation around them.

These findings also suggest **that current methods utilized by the EPA and state agencies to educate residents about environmental hazards may not be working**. Public meetings and mailed letters may not be the most effective means of communicating a health hazard to low income, minority neighborhoods. Without proper knowledge of the situation around them, impacted residents are at a disadvantage when taking their health and the health of their children or grandchildren into account. The lack of awareness within African American households points towards a possibility of environmental injustices being present in the attitudes towards the soil contamination of South Chattanooga. Environmental justice is defined by the EPA as being "fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws regulations, and policies."[2] This phenomenon has been shown to disproportionally affect minorities and low-income households.

RECOMMENDATIONS

Our current funding only allows us to test within the designated Superfund site but, due to the site's continued expansion, it is our recommendation that all children under six years old in Chattanooga be tested for blood lead levels. We will implement plan this pending additional funding. Secondly, continued collaborations with our community partners will be essential to improving the lives of Chattanooga's Southside residents through environmental education.

ACKNOWLEDGEMENTS/REFERENCES

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