

5-2018

Environmental injustice: a public health problem in Chattanooga

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Environmental Injustice: A Public Health Problem in Chattanooga

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Departmental Honors Thesis

University of Tennessee Chattanooga

Integrated Studies

Examination Date: March 28, 2018

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Abstract

The concept of environmental injustice stems from the building of environmentally harmful infrastructure in minority communities. These communities are disproportionately subjected to increased environmental risk than other areas of society. As there is a large minority and impoverished population on the Southside of Chattanooga these issues are prevalent. Hamilton County was determined as a hotspot for childhood lead poisoning. The EPA began testing the soil for lead, but residents have not seen efforts to completely resolve the issue. In this study, a survey was used to assess community awareness of the lead contaminated soil and to highlight the aspects of environmental injustice effecting Cowart Place and Southside Gardens within the Southside community. In this study none of the residents with children had their children blood tested for lead even though their neighborhood was identified as a hotspot for soil lead contamination. This lack of individual prevention could be a product of the lack of awareness proven by the survey in which only one respondent (9%) was aware of the soil lead contamination. As a result of these findings, recommendations are presented to address the issue and minimize the possibility of reoccurrence. Reasons as to why environmental injustice existed in this community are also explored to better inform the recommendations.

Introduction

Environmental injustice is a phenomenon that occurs in the United States and around the world in which people of minority groups and lower socio-economic status are disproportionately affected by pollution and Locally Unwanted Land Uses (LULUs) (Kibert 2001). As a result of the disproportionate impact on people of color, “environmental justice” was referred to as “environmental racism”; however, it is now apparent that environmental health risks are imposed predominantly on lower income groups of all racial and ethnic groups (Kibert, 2001).

The United States Environmental Protection Agency (EPA) defines “environmental justice” as the “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” (EPA, 2018). Therefore, no group – including racial, ethnic, or socioeconomic groups – should bear a disproportionate share of negative environmental consequences resulting from governmental operations or the execution of federal, state, or local programs.

The environmental justice movement is approximately 40 years old dating back to 1979, in Houston, Texas when residents formed a community action group to block a hazardous waste facility from being built in their middle-class African American neighborhood (Kibert, 2001). A

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few years later, environmental justice made news in Warren, North Carolina in 1982 when a protest regarding the placement of a PCB landfill in a predominantly African American area resulted in over 500 arrests (Kibert, 2001). It was later discovered that three out of the four landfills of that region were located in African American areas, even though those areas were only comprised of 20 percent of the region's population (EPA, 2018).

In 1994, President Clinton issued Executive Order No. 12898, which ordered federal agencies to comply with Title VI for all federally funded programs and activities that affect human health or the environment (Kibert, 2001). Title VI states, "No person in the United States, shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under a program or activity receiving federal financial assistance" (Title VI, 1964). Title VI increased governmental accountability for acts, which they were already responsible; however, today these targeted communities are still suffering from acts of environmental injustice. This issue needs to be addressed to help suffering communities in the United States, and specifically in Chattanooga, TN, where there are soil lead contamination issues in low-income communities, which is a potential environmental injustice case (Kibert, 2001). Soil lead contamination can cause lead poisoning in children, which creates serious health issues (Mielke, 1998).

Lead poisoning in children is most commonly associated with lead-based paint; however, lead in soil is a growing problem in the United States today (Mielke, 1998). Lead in soil is at least or more important than lead-based paint as a pathway of human lead exposure and is often associated with severe lead poisoning (Mielke 1998). According to the Center for Disease Control and Prevention (CDC), soil lead is also associated with population blood levels of 5 mg/dL of lead in blood of children aged 1-5 years. It is a greater risk factor than lead-based paint

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to children engaged in hand-to-mouth behavior (Mielke 1998). Children who play outdoors and are exposed to lead-contaminated soil are at higher risk for childhood lead poisoning (Ford 2014). This study highlights the urgent concern of childhood lead poisoning as it relates to community awareness and environmental injustice because of the prevalence of soil lead contamination in marginalized communities such as, Cowart Place, Southside Gardens, Jefferson Heights, and Alton Park.

History of Prevention Methods for Lead Poisoning

In the 1970s, the struggle of lead poisoning prevention stemmed from it being more source directed rather than case-oriented (Silbergeld, 1997). Unprecedented measures were taken to identify and prevent lead exposures prior to exposure of children. The two critical measures taken were setting enforceable standards for environmental media and drinking water, and specific restrictions on certain uses of lead (Silbergeld, 1997). These actions were possible because of the creation of new governmental institutions, the EPA and the Occupational Safety and Health Administration (OSHA).

From 1976-1991, the successful regulation of certain lead sources substantially lowered average BLLs (blood lead levels) in children in the United States (Silbergeld, 1997). The role of removing lead from gasoline was a key contributor in the reduction (Silbergeld, 1997). One of the most dramatic and innovative attempts at primary prevention was an economic disincentive against lead consumption. It was introduced as legislation by Congressman Ben Cardin of Maryland in 1993 (Silbergeld, 1997). He proposed a tax on lead, which would encourage product substitution by “leveling the playing field” and provide funds dedicated to the screening of children and abatement of past uses of lead (Silbergeld, 1997). His initiative failed because of the anti-tax climate, but it represents a big push in public health strategies in primary prevention.

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An important aspect of disease prevention is screening. It is a method of secondary prevention, which is defined as “preventative measures that lead to early diagnosis and prompt treatment of a disease or injury to limit disability and prevent more severe pathogenesis” (Silbergeld, 1997). It not only identifies individuals at risk, but it can also permit health authorities and others to identify sources of lead and reduce or remove them prior to other children being exposed. Screening increased in the 1970s in many cities and states until the early 1980s, when screening decreased in the face of efforts to defund public health programs (Silbergeld, 1997). The costs increased, and logistics became more complicated. In 1991, the CDC recommended that *all* children under the age of two years be screened at least once by blood lead testing (CDC, 1991). Shortly after this recommendation by the CDC, criticisms were expressed from several sources (Silbergeld, 1997). Physicians criticized the recommendation of universal blood lead screenings as inflexible and unresponsive to local conditions (Bergman, 1995). They argued that lead poisoning was unknown in many communities where risk factors were low, and that in these situations requiring universal screening was an unacceptable waste of valuable health resources (Silbergeld, 1997). Some localities reported that the screenings revealed a greater prevalence of lead exposures in children, but others found few occurrences. In 1993, the American Academy of Pediatrics endorsed universal screening, which put significant pressure on the CDC (Committee on Environmental Health, 1993). As a result, in 1995, the CDC reopened its recommendation for universal screening concluding that while it is probably true that in some communities only few children are exposed to lead, the practical challenge is to develop a method that accurately defines these communities without missing children who are at risk of lead exposure (Tejeda, 1994). Despite the controversy over the best prevention method

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for lead poisoning, by screening or environmental interventions, studies have shown major overall benefits to reducing lead exposures in children (Silbergeld, 1997).

The prevention of lead poisoning achieved significant successes in the 1980s because of new advances and discoveries about the nature and extent of lead toxicity (Silbergeld, 1997). However, the push for prevention suffered extreme setbacks near the end of the 1980s for three reasons:

1. The “easy” tasks of source reduction
2. The decrease in the urgency of lead poisoning as an issue among the U.S public because lead poisoning was viewed as a disease affecting only a portion of the population
3. The remaining sources of lead exposures for children – lead in housing and soil – showed early signs of significant economic costs for their solution (Silbergeld, 1997).

Despite all previous and historical attempts lead poisoning still impacts all populations predominantly in disadvantaged, African American populations of society, and a solution must be found to resolve the issue of the unequal sharing of the risks of lead poisoning and the prevalence in children as a whole (Ford, 2014).

Background

The EPA and the Tennessee Department of Environment and Conservation (TDEC) are conducting an environmental study of soil lead in parts of the Southside of Chattanooga.

Previous actions were taken in 2011 when 115 homes were assessed and again in 2012 when the EPA conducted a clean-up of 84 properties because of soil contamination that exceeded the public health action level (Ford 2014). According to the EPA, several foundries operated in

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Chattanooga from 1801 until 2001. There were about 60 foundries, primarily brass and iron, and many of them specialized in melting and casting metal into desired shapes (EPA, 2011). The next step after creating the desired shapes was to break down the sand molds and reuse most of the sand mixture. However, some fine particles from the sand mixture could not be reused and were considered waste, called spent foundry sand (EPA, 2011). It was a common practice in the early 20th century to give nearby residents their excess foundry sand to use as fill material (EPA, 2011). Spent foundry sand is usually found near the surface and can contain elevated levels of lead and other metals (EPA, 2011).

In the state of Tennessee, Hamilton County was recently identified as a hotspot of blood lead poisoning in children under the age of six, and South Chattanooga was an area of high blood lead levels in children (Ford 2014). Childhood lead poisoning is one of the EPA's main concerns. An EPA employee expressed this concern while cleaning up a Chattanooga resident's yard in 2012 saying, "We're doing this for the kids. It's important to keep them safe" (Laprad 2012). It is unclear whether the Southside community is fully aware of the dangers of the contamination and childhood lead poisoning. To support EPA's efforts to make the community safer, for this project, I assessed the community's knowledge of lead poisoning and determined the rate of lead testing of children in the at-risk communities of Cowart Place and Southside Gardens through a door-to-door survey.

Evaluating the knowledge and education levels of the community members about the lead poisoning problem in their community can provide some evidence as to why environmental injustice only occurs in minority and low- socioeconomic communities (Kibert, 2001). Tom Frieden, Director of the Centers for Disease Control and Prevention, stated that, "Your longevity and health are more determined by your zip code than they are by your genetic code"

(Weintraub, 2014). Whether it be financial status, race, or education level, all of these factors determine where people live, which in turn is a direct indicator of health. The purpose of this study is to evaluate the level of awareness of an environmental contaminant (soil lead), bring light to the possible negative impacts of environmental injustice on the Southside of Chattanooga, and investigate insight into why it even exists.

Methodology

Population

The population for this study was determined by the communities chosen to be sampled for the survey. The specific communities chosen for this study were Cowart Place and Southside Gardens. These two neighborhoods were targeted by the EPA as potential neighborhoods with soil lead problems (Figure 1). To address the research questions of this study, the residents needed to live in an area affected by lead poisoning.

Residents of these neighborhoods were randomly selected by members on my team to be asked to participate in the survey. To conduct the survey, we walked the streets of the neighborhoods knocking on random doors. The randomization of residents sampled eliminated bias.

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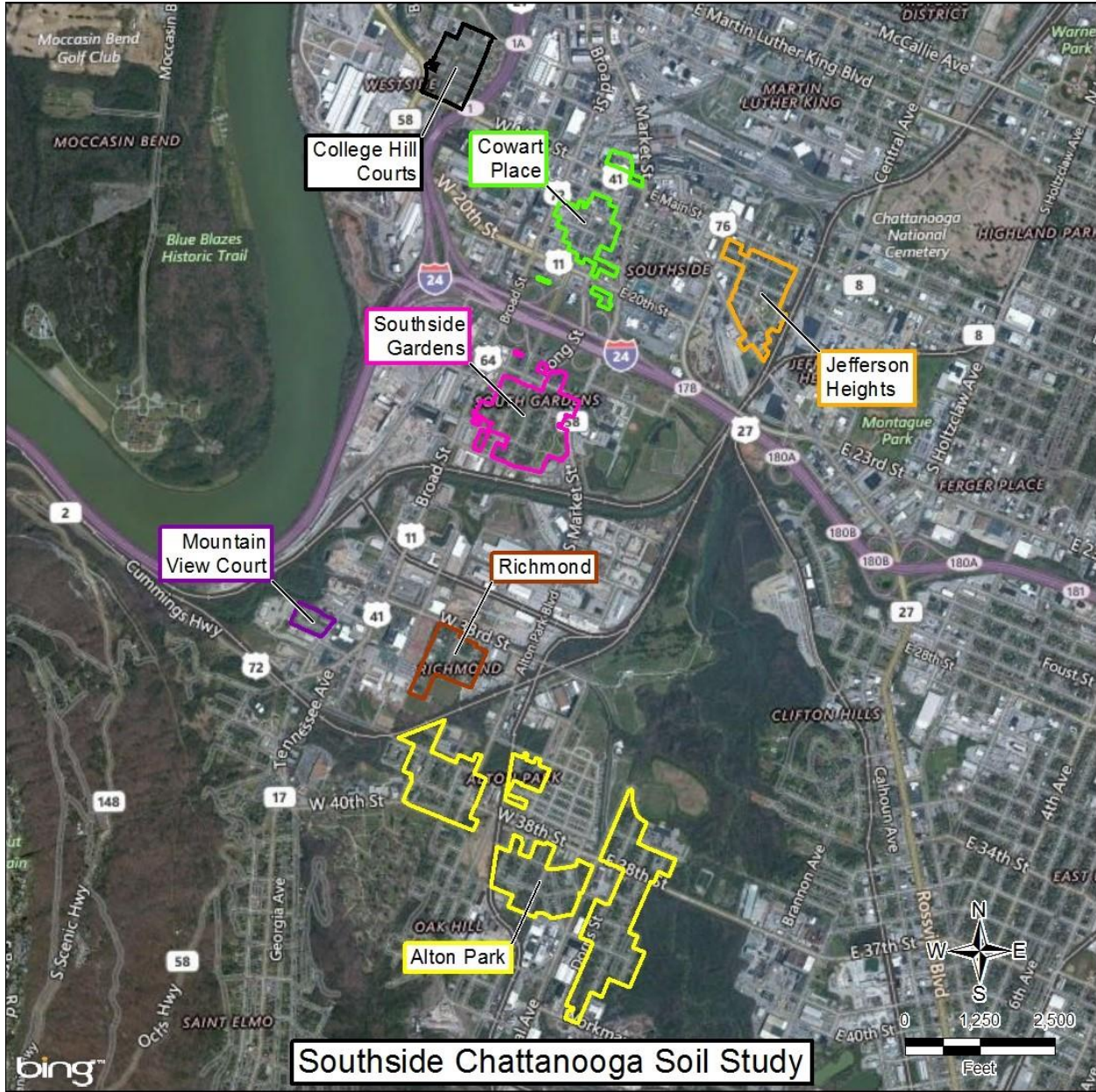


Figure 1: Map of Affected Areas

Survey Method

Door-to-door surveys are commonly used in developing countries and rural areas that do not have postal, telecommunication, and internet infrastructure needed to make the other

methods more practical (Davies, 2011). This method is often seen as too costly for researchers, too intrusive for participants, and too dangerous for interviewers when other survey methods are feasible (Corey & Freeman, 1990). Because of this insight, only few published studies provide details about how door-to-door surveys are conducted, the barriers and facilitators to implementing them, or the value they add to public health research (Davies, 2011). This method of collecting data may no longer be the dominant mode, but health organizations such as the World Health Organization still use it for its World Health Survey, and it is a common method used for health screenings (World Health Organization, 2011). Although door-to-door surveys are time and labor intensive, conducting interviews face-to-face contributes to the overall quality of data collected as interviewers develop a sense of responsibility for their health and the health of their family as well as the well-being of their community (Hiller, 2012). Most importantly, conducting door-to-door surveys allows the interviewers to provide on the spot information about the study and answer any questions. It could lead to more community involvement while raising awareness for the issue.

In order to assess the community members' knowledge about lead poisoning and its health impacts, I conducted a door-to-door survey in the communities of Cowart Place and Southside Gardens. The survey was developed and administered by Sloan and Ford in 2014 in Jefferson Heights (Ford, 2014). It assesses demographics, the number of and age of children living in the home, gender, whether or not the children have ever been blood tested for lead, and additional information about the home, family habits, and work locations of the parents. I planned to interview 50 residents with or without children in the targeted areas. I decided to make 50 my target because it is more than the number needed for statistical significance or the probability of the study to reject the null hypothesis and seemed like an attainable goal. Through

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the data collected from this survey, I was able to analyze the need for educating the community about the high risks of lead poisoning based on the rate of lead testing determined, and which demographics are affected most. My team and I administered the survey by walking door to door and asking residents to answer a few questions (participate in the survey). We either verbally read the questions to them or waited for them to take the survey on paper and return it to me. The survey was not translated in Spanish, but I had a Spanish speaking colleague accompany me as I went door-to-door. At the end of each survey the residents were provided a handout from the CDC about childhood lead poisoning (available in both English and Spanish).

Survey Questions and Data Analysis

There survey was comprised of 23 questions (Appendix A). Most of the questions were specific to children and blood lead testing. The questions most pertinent to this study are questions 7-9, “Are you aware of lead contamination in your community?”, “Have you seen your children eat paint chips, soil, or dirt”, and “Have you ever been told that your children should be tested for lead poisoning?” because they specifically relate to the knowledge level of residents about the community problem with lead in soil and childhood lead poisoning in general. The survey also included a few demographic questions.

Data were recorded in a Microsoft™ Excel spreadsheet. The data were sorted by date and whether or not they answered yes or no to question number 3, “Do you have children in your home?” If they answered no to question two the interviewer skipped to question 20. Question number 3 asks if the resident has any children in the home under the age of 6. This division of the survey allowed me to analyze the responses based on the presence of children in the home and provide those residents with additional information about the risks associated with childhood lead poisoning.

Ethical Procedures

Institutional Review Board (IRB) approval was obtained from the University of Tennessee Chattanooga. The IRB approval number is 17-108. The survey was voluntary, and the residents had the right to refuse. None of the participating residents were paid to take the survey. No protected health information was collected. All survey data collected were entered into a protected spreadsheet. Surveys did not contain names or other personal identifying information. Data were aggregated and analyzed as one large dataset. Individual results were not of interest in this research. The principal investigators of this project had access to the data and the raw data will be retained for one year. After one year, files will be deleted, and hard copies will be shredded.

Results

A total of 36 survey responses were received over the span of three days: 11/18/18, 11/19/18, & 12/9/18. The goal was to get a total of 50, but only 30 were needed for statistical significance. The goal set was 50 and not 30 to increase significance; however, data was collected during mid-day Saturday and Sunday mornings. Residents were either not home or simply did not answer the door for unknown reasons. Sixty-nine percent of the respondents did not have children, and thirty-one percent of the respondents have children. In the category of respondents that have children, 93% of them were African-American and more than half of the children were females (Figures 3 & 4). The category of respondents that have children also had to answer question #7, which was “Are you aware of any lead contamination in your community?” Ninety-one percent of those respondents answered no (Figure 2). None of the respondents that had children reported having their children tested for lead poisoning. These data indicate that most of the individuals living in this community are African-American and that

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most of the children are female. It also indicates that almost none of them know about the lead contamination problem in their community. This information implies that there is a direct relationship between minority communities being uninformed about problems going on in their communities that highlight health disparities and racial inequality. A similar door-to-door survey study was conducted by Ford and Sloan (personal communication) and findings showed that the majority of residents had not taken their children to be blood tested for lead. Whether the lack of action was a result of not being informed about the community lead poisoning problem or about lead poisoning in general is unknown.

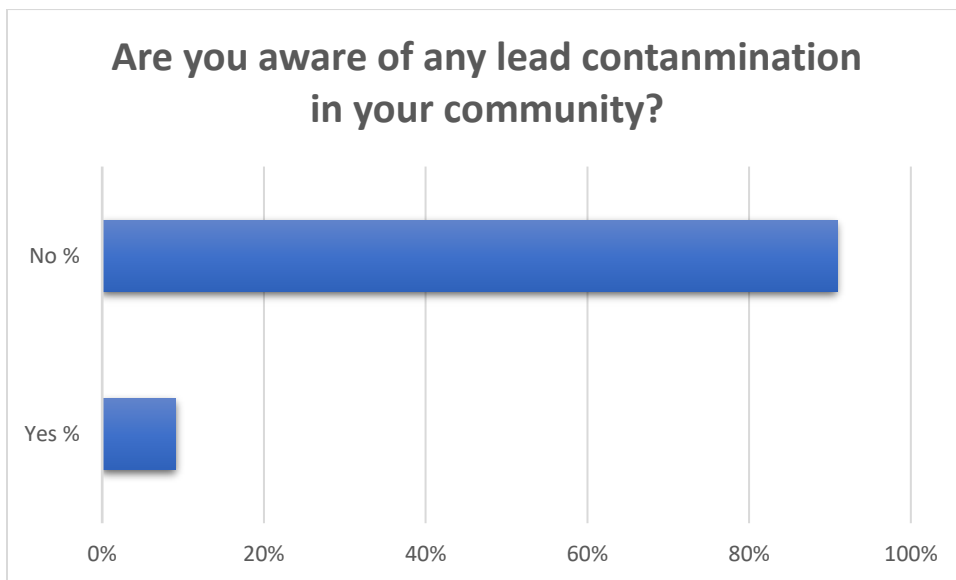


Figure 2: Question 7 Results

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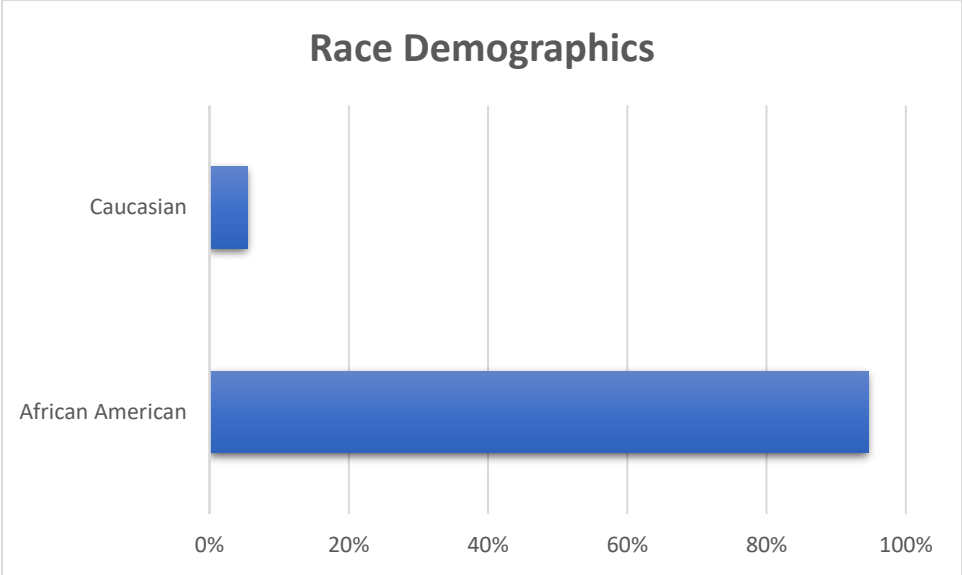


Figure 3: Race Demographics

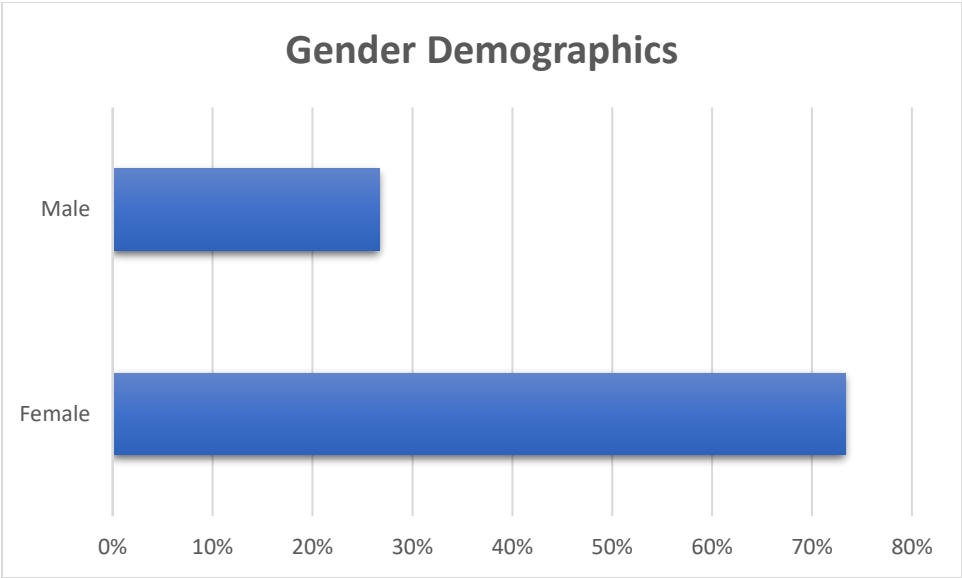


Figure 4: Gender Demographics

Characteristic	Frequency
Male	4 (27%)
Female	11 (73%)
	15
African American	14 (93%)
Caucasian	1 (7%)

	15
With Children	11 (31%)
Without Children	25 (69%)
	36
Blood Tested	0 (0%)
Not Blood Tested	11 (100%)
	11

Figure 5: Data Frequencies of Selected Questions on the Survey

Discussion, Recommendations, and Conclusions

Interpretation of the Findings

The purpose of this study was to assess the awareness of community members about childhood lead poisoning, rate of blood lead testing in children in impacted neighborhoods, and to highlight indicators associated with environmental injustice. Based on the survey results, approximately nine percent of the residents who participated in the survey reported having knowledge about the soil lead contamination problem in their community. These findings indicate that very few residents have been informed of the soil lead contamination in their community. Recently, a public meeting was held to inform residents about the issue and the solution to the problem (Pace, 2018). Many residents were not happy that they were just now learning about the issue and said that they “hold the EPA responsible for resolving the issue and keeping their children safe” (Pace, 2018). These data along with the concerns voiced by the residents suggests that any decisions made by the EPA or local health officials have not included input from the community members.

Observations

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While conducting the survey many observations were made. While the majority of surveyed residents were unsure of the age of their home the house, houses looked older and needed maintenance. It seemed that the residents did not have much money based on the way they were living and the part of town we were surveying. The houses were falling apart, the paint was chipped, and it appeared that there was not much upkeep. The people that answered the door seemed confused about why I was at their door and once informed of the study were more inclined to answer the questions. Many asked me questions in return to gain more information about the community issue. It became apparent to me through these observations that most of the people living in this community were minorities because 93% of respondents were African American. It seemed that they belonged to a lower socio-economic class because of their living conditions. According to the CDC, poverty and pre-1950 housing are both risk factors for lead poisoning (CDC, 2013). Other studies show that race is also a risk factor for lead poisoning (Gould, 2009). For example, Ford (2014) found that African American boys were more likely to have lead poisoning than any other group.

These data indicate that most of the individuals living in this community are African-American and that most of the children are female. It also indicates that almost none of them know about the lead contamination problem in their community. This information implies that there is a direct relationship between minority communities being uninformed about problems going on in their communities that highlight health disparities and racial inequality. A similar door-to-door survey study was conducted by Ford and Sloan (personal communication) and findings showed that the majority of residents had not taken their children to be blood tested for lead. Whether the lack of action was a result of not being informed about the community lead poisoning problem or about lead poisoning in general is unknown.

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These findings suggest that these social factors contribute to the occurrence of environmental injustice in this community because they seem to indicate that these Chattanooga communities are poor and have a large minority population. A distinct type of environmentalism has arisen within communities of color and poverty called environmental justice, which focuses on the unequal distribution of environmental burdens across groups of people (Mohai & Saha, 2007). Furthermore, Dr. Robert D. Bullard, often referred to as the father of environmental justice, wrote, “whether by conscious design or institutional neglect, communities of color in urban ghettos, in rural ‘poverty pockets’, or on economically impoverished Native-American reservations face some of the worst environmental devastation in the nation” (EPA, 2018). Based on our observations, the statements above are strongly supported. Soil lead contamination, an environmental burden, is a problem on the Southside of Chattanooga because it is an economically impoverished community made up of minorities.

Out of the survey participants that had children, none of them reported having their children tested for lead poisoning. This reinforces the residents lack of knowledge about the lead poisoning problem in their community. It suggests that the residents and their children are at a higher risk of suffering from the effects of lead poisoning due to their lack of knowledge. Failure to inform the residents of the lead poisoning issue and communicate the risks associated with lead poisoning results in a lack of individual action that could have been taken in the form of preventative measures. This suggests that the safety of the residents and their children is completely dependent upon the actions of the EPA and local government who may or may not know anything about the communities in which this issue exists.

Limitations to the Study

The main limitation in this study was the survey method. Using door-to-door surveys was a risky choice considering the amount of data collected was dependent upon the number of residents who opened their doors. However, door-to-door surveys were deemed the best method considering that conducting the survey provided the opportunity to have direct communication with the residents. While gathering data regarding the lead poisoning problem, we were able to inform and educate the residents about the problem and encourage them to get involved and seek more information.

Another limitation in the study was the scope of the data in terms of whether or not the residents had children or not. A lot of the questions in the survey were skipped if the participant had no children because they pertained to the presence of children in the home. There was no way of knowing prior to conducting the survey which residents specifically had children. In order to address this issue, we recorded children in the home in the survey data even if they were over the age of six to try and compensate for the low number of residents that reported having children. While children age six and under are at a higher risk for lead poisoning, all children can be affected by it.

Recommendations

While this study has indicated the lack of awareness of soil lead contamination within the communities of Cowart Place and Southside Gardens and highlighted the possible existence of environmental injustice, there are ways to improve the education level and ensure that instances of environmental injustice decrease. In this study, it was found that an overwhelming majority of participants reported having no knowledge of the lead contamination issue in their community. It was also found that data collected, and observations made during the study correlate with the risk

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factors associated with lead poisoning. The concept of environmental injustice in relation to the risk factors of lead poisoning provides a context in which to emphasize the fundamental tie of the degradation of the environment to the disproportionate burden placed on disenfranchised members of society: minorities and the poor (Kibert, 2001). To better inform the recommendations proposed in this study research was conducted on the history of previous prevention methods and soil remediation.

Soil Remediation

The Agency for Toxic Substance and Disease Registry (ATSDR) identified lead-contaminated soils as a significant source of lead exposures for children in the United States (ATSDR, 2018). In Chattanooga specifically, it is evident that this is an issue on the Southside of the city as a result of waste from the foundries that once resided in the area. Past studies have shown that soil remediation in residential areas only has modest or non-significant effects (Farrell 1998). Results from EPA's Three City Urban Soil Lead Abatement Demonstration Project suggest that substantial declines in soil lead cause only modest or no reduction in mildly elevated blood lead concentrations (Farrell, 1998). However, in the scope of their study soil remediation in communities near lead mining, milling, or smelting were not considered. Therefore, soil remediation in the Chattanooga communities for this study could have beneficial effects considering their proximity to foundries in past years. There would also be less risk for recontamination as the foundries no longer operate in the communities. The EPA has already started replacing the soil in the homes of effected communities as mentioned in the background section. Although the soil abatement could possibly be highly beneficial in decreasing the rate of lead poisoning, it only prevents future cases of lead poisoning and does nothing about the long-term effects or addresses the root of the issue: environmental injustice.

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Educating the Community Members

Based on the survey data, most of the residents have no knowledge of the soil-lead contamination problem in their community or about lead poisoning at all. A preventative measure that can reduce the cases of lead poisoning and alleviate some of the harsh effects of environmental injustice is to simply educate the community members about the issue and ways they personally can keep themselves and their families protected. However, this method of prevention is not as easy as it sounds. In order to effectively educate the community members, the EPA and local health officials must first gain their trust. The EPA and local health officials are outsiders to the community. The majority of the residents in the community are minorities meaning there is a factor of mistrust of the health care system and the government as a whole. Historical events, such as the Tuskegee syphilis study and the Henrietta Lacks case reinforced by health system issues and discriminatory acts that continue to this day have created a barrier of mistrust expressed across minority populations (Scharff, 2010). In order to combat the mistrust of the community population, the EPA and local health officials must get leaders of the community involved that know the community and are respected by the residents.

Once the trust of the community members is gained, community meetings could be held about the lead contamination issue, and EPA employees, local health officials, and other involved community members could go door-to-door and providing residents with handouts about approaches to fighting lead poisoning they can use in their homes. These approaches should include eating healthy foods, how to garden safely in lead contaminated soil, and how to keep the contaminated soil from getting inside the home (ATSDR, 2010).

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Policy Reforms to Effectively Combat Environmental Injustice

The solution to solving issues of environmental injustice should have legal elements but should also be supplemented by philosophical and practical elements. It is necessary for legal remedies to remain an essential part, but there is also a need for solutions that go beyond litigation. For example, environmental lawyers fail to understand civil rights law, and civil rights lawyers fail to understand environmental law (Kibert, 2001). In order to effectively fight for environmental justice these two areas need to be merged. Title VI prohibits intentional discrimination, but the Supreme Court has ruled that Title VI authorizes federal agencies to adopt regulations that prohibit discriminatory effects (Kibert, 2001). This means that a policy that has a discriminatory effect will violate Title VI unless the EPA proves that there is no less discriminatory alternative, which then makes it justifiable. Some local governments and developers have complained that Title VI hinders redevelopment (Kibert, 2001). As a result, the EPA produced a report that basically stated if the community is involved then Title VI actions are not necessary, but in situations where the local government acts alone challenges may arise (Kibert, 2001). Local governments see Title VI as an obstacle in the way of renovating communities, and as a result find loopholes to overcome it. It is evident that Title VI's purpose was pure, but it has made the issue worse in some ways. In an attempt to avoid Title VI regulations local governments have just gotten better at hiding it. This is why environmental injustice is still a problem in cities like Flint, Michigan and Uniontown, Alabama.

Just recently, the EPA rejected the Uniontown's claim of environmental racism claiming there was insufficient evidence (Milman, 2018). Ben Eaton, a resident of Uniontown for 33 years, said he could not take the government's ruling seriously and blames frequent headaches and burning eyes on the toxic landfill (Milman, 2018). He also said he feels he has no protection

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from the government and cannot help but think that it is because his community is mostly African American and poor (Milman, 2018). The residents complain of nosebleeds, breathing difficulties, cancers, and mental health issues as a result of the coal burning, which contains toxins such as mercury and arsenic. Despite the residents' complaints, authorities have yet to conduct a study on the health effects (Milman, 2018). Dr. Robert Bullard voiced his opinion on the issues stating, "The shipping of toxic coal ash from a mostly white county in Tennessee to this rural, poor, and most black county and community in the Alabama black belt is a textbook case of environmental racism" (Milman, 2018). In 2013, several dozen residents filed complaints under Title VI and the EPA still rejected their claim (Milman, 2018). Uniontown residents filed complaints, expressed their health issues, and have sought out resources yet the issue still remains unresolved.

Cases such as this and the lead contaminated soil here in Chattanooga are why a new civil right should be developed. A civil right not based on color, economic status, or gender, but based on the right of all people to live free from environmental health risks. This right should be implemented in policies such as Title VI that seek to address issues such as environmental injustice. While litigation is an effective method in resolving issues in most cases, a combination of law and philosophy in regard to what is best for all of humanity, is the best approach.

Implications

This study has the potential to impact the lives of many children and families of poor, minority communities suffering from the effects of environmental injustice. It has highlighted indicators of environmental injustice in relation the risk factors of lead poisoning and other cases of harmful infrastructure effecting the environment. The connections made in this study can be

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used to indicate the seriousness of environmental injustice and push local governments to push harder to resolve these issues and prevent them from ever happening again.

Local governments can change their methods of prevention to focus more on community involvement, rather than acting solely with the EPA and TDEC to resolve an issue in a community. Interventions targeting childhood lead poisoning that focused on education were deemed unsuccessful; however, it was not the method of prevention that was the problem, it's who was responsible for the education (Bellinger & Bellinger, 2006). If the community members already have a culture of distrust due to previous historical events and the current local government's failure to inform and value their input about the issue, then why would they listen to the government and health officials? Just as one person should never speak for a whole community, a solution should not be created with the input of only one perspective. While target remediation effectively gets rid of the source of the lead poisoning, it does nothing to combat the lack of environmental justice in specific communities or ensure that reoccurrence of issues such as the soil lead contamination will cease to exist.

The creation of policies that enforce litigation, while also considering the social stigmas of society can effectively eradicate the issue of environmental injustice. The trend of the presence of environmental health risks in poor, minority communities is no coincidence, and should no longer be tolerated. The implications of this study can result in a huge shift in the way poor, minority communities are valued in the U.S by showing a real effort towards seeking environmental justice for *all* members of society.

Conclusion

Recently, the city of Chattanooga was awarded \$1.65M to reduce citizen exposure to lead (WCTV, 2018). The article says the money will be used for paint remediation and the renovation

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of unsafe houses (WCTV, 2018). This grant could result in safer houses for children and families in lead contaminated communities, but what about the reason they are suffering from lead exposure in the first place? In addition, in February 2018, EPA held a public meeting in the Southside community to commit to remediating all residential yards that have unsafe levels of lead if the site is added to the National Priorities List, which will qualify it for federal funding (Pace, 2018).

Environmental injustice is real. It is as real as injustice found in housing, education, employment, and the judicial system. The continuation of mainstream environmental groups and local governments implementing solutions without community input will only result in the preservation of the unequal distribution of environmental health risks. Right now, local governments and environmental health agencies such as the EPA and TDEC are only implementing solutions that eliminate the source of the health risks. Remediation fixes part of the problem, but the part that serves as the root of all of the environmental health risks found in poor, minority communities remains intact. This study has attempted to shed light on the prominence of environmental injustice seen through the situation that exists here in Chattanooga and suggested changing the methods of intervention to include more community input and the consideration of the right for all humans to live in a safe environment free of health risks. Environmental injustice is a nationwide problem and has given new recognition to the fact that the structural oppression of people of color in this society manifests itself in more ways than traditional civil-rights based paradigms (Ulezalka, 2007). The reality is that despite calls for a race-neutral consciousness, racial differences still exist in the distribution of benefits and burdens borne by individuals in society (Ulezalka, 2007). No one is saying start building all the harmful infrastructure in predominantly white, middle-class neighborhoods or move all the toxic dumps

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there; those things should not exist in anyone's neighborhood. Justice is not achieved by doing an injustice to somebody else, it is achieved by the intertwining of different perspectives of people within and outside the community coming together for a common goal. The implications of this study can initiate a huge change in the way local governments and governmental health agencies resolve cases of environmental injustice and prevent new cases from ever existing.

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Appendix A

Community Assessment Survey

Good morning/afternoon my name is <interviewer 1> and this <interviewer 2>. We are with the University of Tennessee at Chattanooga. We are conducting a brief community survey about childhood lead poisoning for residents living in this area. It should take about 5-10 minutes of your time. This information will help us better understand childhood lead poisoning. All of your responses are confidential. Are you willing to participate today?

___ Yes

___ No

Read Only if Necessary

Q1. Are you over 18?

If YES → Skip to Q2

If NO → Is there an adult in the home that we can speak to?

If YES → Repeat introduction with adult and go to

Q3. How many children in your household are under the age of six?

___ 1

___ 4

___ 2

___ 5

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3 more than 5

Q4. Does your child(ren) live in or regularly visit a home built before 1950?

Yes

No

Don't know

Q5. Within the past six months, has/have your child(ren) lived in or regularly visited a house built before 1978 with recent or current remodeling ?

Yes

No

Don't know

Q6. Does your child come into contact with an adult who works with lead? For example, a smelter or battery plant?

Yes

No

Don't know

Q7. Are you aware of any lead contamination in your community?

Yes

No

Don't know

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Q8. Have you seen your child(ren) eat paint chips, soil, or dirt?

Yes

No

Don't know

Q9. Have you ever been told that your child(ren) should be tested for lead poisoning?

Yes

No

Don't know

Q10. Has/have any of your child(ren) been tested for lead poisoning?

Yes

No (skip to Q17)

Don't know

Q11. Approximately how long ago was/were your child(ren) tested for lead poisoning?

Q12. Did the test for lead poisoning detect an elevated blood lead level in your child(ren)?

Yes

No (skip to Q17)

Don't know

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Q13. What was the elevated blood lead level in your child(ren)?

5-9 ug/dL

10-19 ug/dL

20-44 ug/dL

more than 45 ug/dL

Don't know/Can't remember

Q14. Have you made any changes in your home to help reduce blood lead levels in your child?

Yes

No

Don't know/Can't remember

Q15. Did your child(ren) get a follow-up test for blood lead?

Yes

No (skip to Q17)

Don't know/Can't remember (skip to Q17)

Q16. Did your child(ren)'s blood lead level go down?

Yes

No

Don't know/Can't remember

Q17. What are your children's ages (those under the age of six)?

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Child 1: ____

Child 2: ____

Child 3: ____

Child 4: ____

Child 5: ____

Q18. What is/are the gender(s) of your child(ren) (those under the age of six)?

Male: ____

Female: ____

Q19. What is/are your child(ren)'s race/ethnicity?

____ Black/African American

____ White

____ Hispanic/Latino

____ Native Hawaiian or Other Pacific Islander

____ American Indian or Alaska Native

____ Other

____ Don't know/Not sure

Q20. What year was this home built?

Year _____

____ Don't know/Not sure

If prior to 1978, go to next question, if 1978 or later, go to end.

Q21. Since you have been living here, have you done any remodeling, painting, or construction on this home?

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Yes

No

Don't know/Can't remember

Q22. Regarding this home, are you aware of any remodeling, painting, or construction done by others?

Yes

No

Don't know/Can't remember

Q23. Since you have been living here, has your yard been dug up and new soil put in?

Yes

No

Don't know/Can't remember

Thanks so much for participating in this survey.

GIVE THE RESPONDENT EDUCATIONAL INFORMATION AT THIS TIME.

If you have questions or concerns about this survey, please call the number provided on this handout.

Thanks again!

