An Analysis of Communities at Risk of Environmental Injustices

Adam Alsamadisi

2010 Rhodes Institute for Regional Studies

Background

The largely accepted definition of 'Environmental Injustice' includes the following elements: 1) the understanding that minority populations and low-income classes bear a disproportionate share of environmental costs[1] 2) factors of demographic identities, such as race and income, in relation to geography, influence the location of potentially hazardous sites[2] 3) minority and low- income populations that suffer from environmental problems are often faced with a "denial of, reduction in, or significant delay in the receipt of benefits," including compensation and retribution[3] and 4) pollution from hazardous sites is unequally distributed "within individual states, within counties, and within cities […] hazardous facilities are disproportionately located in poor and minority neighborhoods[1]. The understanding that environmental costs are 'disproportionately' borne demographic identities is pivotal to understanding issues of environmental injustice.

This definition led to the National People of Color Environmental Leadership Summit's comprehensive statement about the Environmental Justice movement as

> "The confluence of three of America's greatest challenges: the struggle against racism and poverty; the effort to preserve and improve the environment; and

---

[1] Massey, Rachel. " Environmental Justice: Income, Race, and Health. Global Development and Environment Institute, Tufts University. Medford MA. 2004

[2] Heiman, Michael K. "Race, Waste, and Class: New Perspectives on Environmental Justice. Dickinson College. April 1996.

[3] Environmental Justice. US Department of Transportation. May 2000. http://www.fhwa.dot.gov/environment/ej2000.htm

> the compelling need to shift social institutions from class division and environmental depletion to social unity and global sustainability."[4]

It is essential that in attempting to understand environmental injustices that various elements are considered to be parts of a greater whole, and how these parts are interrelated is essential to fully comprehend an environmental injustice.

It is important to bear in mind that environmental injustices are a pan-minority problem. That is to say, there have been recorded instances of environmental injustices throughout the United States from a vast number of various minority communities, ranging from Latino-Americans in San Antonio, TX to African-Americans in Memphis, TN to Asian Americans in Los Angeles. California provides a good case study for environmental issues, as the state fosters 11 of the nation's 25 worst counties for ozone contamination, and much research has been done on the cancer rate in California- 25% higher than the nation's average.[4] A study on Environmental Injustices in California noted: In 1996, the estimated risk of a person getting cancer in California due to a lifetime exposure to outdoor air pollutants was 310 times higher than the federal Clean Air Act goal of 1 person in 1 million."[4] The study was then broken down into prevalence by race (Figure 1):

---

[4] "Building Healthy Communities from the Ground Up: Environmental Justice in California" (PDF). Environmental Health Coalition. http://www.cbecal.org/pdf/healthy-communities.pdf. Retrieved April 2007.

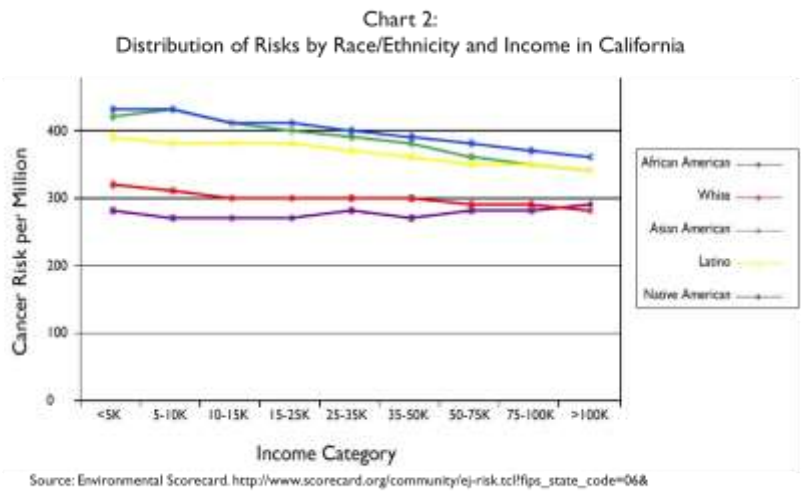


Figure 1. Cancer risks analyzed in respect to income and race
Source: Environmental Scorecard[4]

As the study states, minority populations largely have a higher cancer risk than white populations, which is exacerbated by lower income levels in the United States. This study notes the intertwined nature of various variables, including health problems. Another factor this study evaluated was the availability of healthcare and transportation to healthcare facilities. The study found that 22.4% of California lacks health insurance, and only 28% of Alameda county residents of color have transportation access to a healthcare facility.[4] This study suggests that minority populations are not only more vulnerable, but more unlikely to have sufficient services.

This research will be conducted in the Defense Depot Neighborhood in Memphis, Tennessee. The community is primarily composed of African-Americans with an average annual

[4] "Building Healthy Communities from the Ground Up: Environmental Justice in California" (PDF). Environmental Health Coalition. http://www.cbecal.org/pdf/healthy-communities.pdf. Retrieved April 2007.

income of $19,786.[5] Few studies address the perception of vulnerability or overall perspective of minority populations in environmentally hazardous sites. As this research will primarily involve the African-American community, solely literature concerning the African American population will be cited, however this topic has been noted to affect all minorities, as further research will show. One article notes that the African American people are primarily motivated to act in response to environmental injustices by the presence of inequality. That is to say, that in terms of environmental issues, research suggests that Black people act in accord with a race based socialist perspective. The following is the conclusion from Arp III and Llorens (1999):

> "Clearly, perceptions of unfairness *served as the catalyst for anger and environmental activity* within the Black communities. What stimulates a Black community's response is the perception of bias. It is interesting to note that it does not seem to matter how upset Black residents are about environmental matters generally or *how seriously they perceive the problem to be*. Perceptions of bias hold the key. For these Black communities, social goods and risks must be equally distributed among all unless unequal distribution is the benefit of all."[6]

This study will seek to dismiss this conclusion, and instead show that the motivation for response against environmental injustice issues is one based off individual and community factors and the perception of how these factors would increase vulnerability to environmental issues. The perception is one based off a particular bond, based on race, income, or another binding factor, that happens to be stronger than the feeling of animosity presumed towards groups with an 'unfair advantage.'

The site and neighborhood to be studied is believed to comply with the third and fourth parts of the definition for environmental injustice, mainly that pollution from a hazardous site is confined to the surrounding low-income minority neighborhood and that compensation for

---

[5]Simpson, Andrea. The Environmental Justice Reader: "Who Hears Their Cry?" The University of Arizona Press, 2002.

[6] Arp III, William and James Llorens. "Environmental Justice for Black Americas: A Question of Fairness. The Western Journal of Black Studies, Vol. 23, No. 2, 1999.

environmentally-related health effects has not been forthcoming, as well as the aforementioned perception of injustices. The site chosen for this study is the Memphis Defense Depot, a 642-acre plot located approximately five miles east of the Mississippi River. The main, more developed section of the Depot occupies 578 acres, whereas Dunn Field, used for waste disposal, occupies approximately 64-acres.[10] The site was first opened in 1941, with operations beginning in 1942.[10] The Defense Depot was to serve for a supply, storage, and maintenance facility beginning during the World War II era for the U.S. Army. Although the Depot supplied food and medical supplies, industrial chemicals, petroleum products, construction materials and other supplies that contain components considered hazardous also resided at the Depot. It is believed that "during the course of normal activities, leaks and spills occurred. Also, items were disposed in the onsite disposal area."[10] DDMT is a registered Superfund site with cleanups currently taking place.

Dunn Field is the aforementioned 'onsite disposal area,' with one of the most notable pollutants coming from German Mustard Bombs from World War II. The ATSDR report discusses the extent of mustard pollution stating, "several thousand pounds of mustard were destroyed and buried in 1946. This material was from twenty- nine 500- pound aerial bombs captured from Germany during the war. The mustard was drained into bleach slurry pits, neutralized (by the bleach solution) and buried."[10] Mustard bombs, known for dermal irritation, were used by the German Army in World War II. However, when mustard becomes a gas, as it was used in wartime, the mustard enters and irritates the lungs, causing them to fill with liquid,

[10] ATSDR: Agency for Toxic Substances & Disease Registry. Public Health Assessments & Health Consultations. USA Defense Depot, Memphis, TN. 1996.

so whoever inhales the gas essentially drowns.[11] Despite evidence of contaminants such as these bombs, the Agency for Toxic Substance and Disease Registry (ATSDR) has found it unlikely that any of the Defense Depot's past activities pose any health risk to the community surrounding the Depot.[10] The report, published in 1996, begins with a letter stating "The conclusion reached is that, although numerous contaminants were detected, they were not of the type and amounts that would pose a public health hazard from the infrequent and short- term dermal exposure, which would be the expected form of contact."[10] This research will evaluate the extent and type of potential exposure experienced by members of the neighborhood surrounding the DDMT- characterized by frequent and long- term dermal exposure such as eating fish from watersheds in the area, contacting water runoff from the Depot property, and from contacting contaminated soils. The research will address the assumption of the ATSDR's conclusion that the public was safe because it was limited to dermal, much less infrequent and short- term exposure.

The population surrounding the Memphis Defense Depot lives in two zip codes, 38106 and 38114.[5] These zip codes are almost 100 percent African American (Figure 2), with a median income of $19,786 (Figure 3).[5] The area is educationally disadvantaged with an estimated four in ten residents without a high school diploma. Less than 1 percent of the residents have a college degree.[5] While half of the residents own their own homes, the other half are renters. About 65

---

[11] Shawn Phillips. Recorded Interview. 2004.

[5] Simpson, Andrea. The Environmental Justice Reader: "Who Hears Their Cry?" The University of Arizona Press, 2002.

percent of the homes in the zip codes by the Depot were constructed before 1950.[5] This is a community severely disadvantaged by various demographics, making it potential candidate population vulnerable environmental injustices. The community has become more active concerning environmental justice with the 1996 formation of the Defense Depot of Memphis Tennessee Concerned Citizens Committee (DDMT-CCC), a group dedicated to furthering awareness of the environmental health threat in the neighborhood.

The co- founder of the DDMT-CCC, Doris Bradshaw, has been the leading voice in the community since her grandmother died of bladder cancer, which she attributes to environmental circumstances.[7] Since 1996, she has taken the movement to the national and international level, and has met with other communities around the country in hopes of national legislature against environmental injustices.[7] Her work has been cited in literature praising her efforts in bringing knowledge of the potential health effects of the Depot on the community. Although the current contaminant levels have been mitigated by EPA sponsored cleanups, the long- term residents affected by 60 years of Depot activity have not been compensated in ways they deem acceptable. Many studies and surveys on the area have been done to ensure the health risk of those residing in the neighborhood is negligible, however community distrust towards of these conclusions stems from an overwhelming amount of health problems in the area. The community complains that the Depot's dumping is responsible for the high cancer rates and unusual prevalence of sickness in the area. Thyroid problems, reproductive organ abnormalities, and birth defects are also present in the community surrounding the Depot.[7] The community is particularly

---

[7] Bradshaw, Doris. Personal Interview 10 June 2010

[7] Bradshaw, Doris. Personal Interview 10 June 2010

disadvantaged because of the lack of available healthcare in the area (Figure 2). The Defense Depot neighborhood is one of the few areas in Memphis without a free healthcare provider within a reasonable distance, with the closest healthcare facility three miles away. A lack of transportation available to access the healthcare facilities provides another obstacle for the residents. This research will present the magnitude of this obstacle in this neighborhood, as well as compare it to the circumstances within different neighborhoods with different demographics.

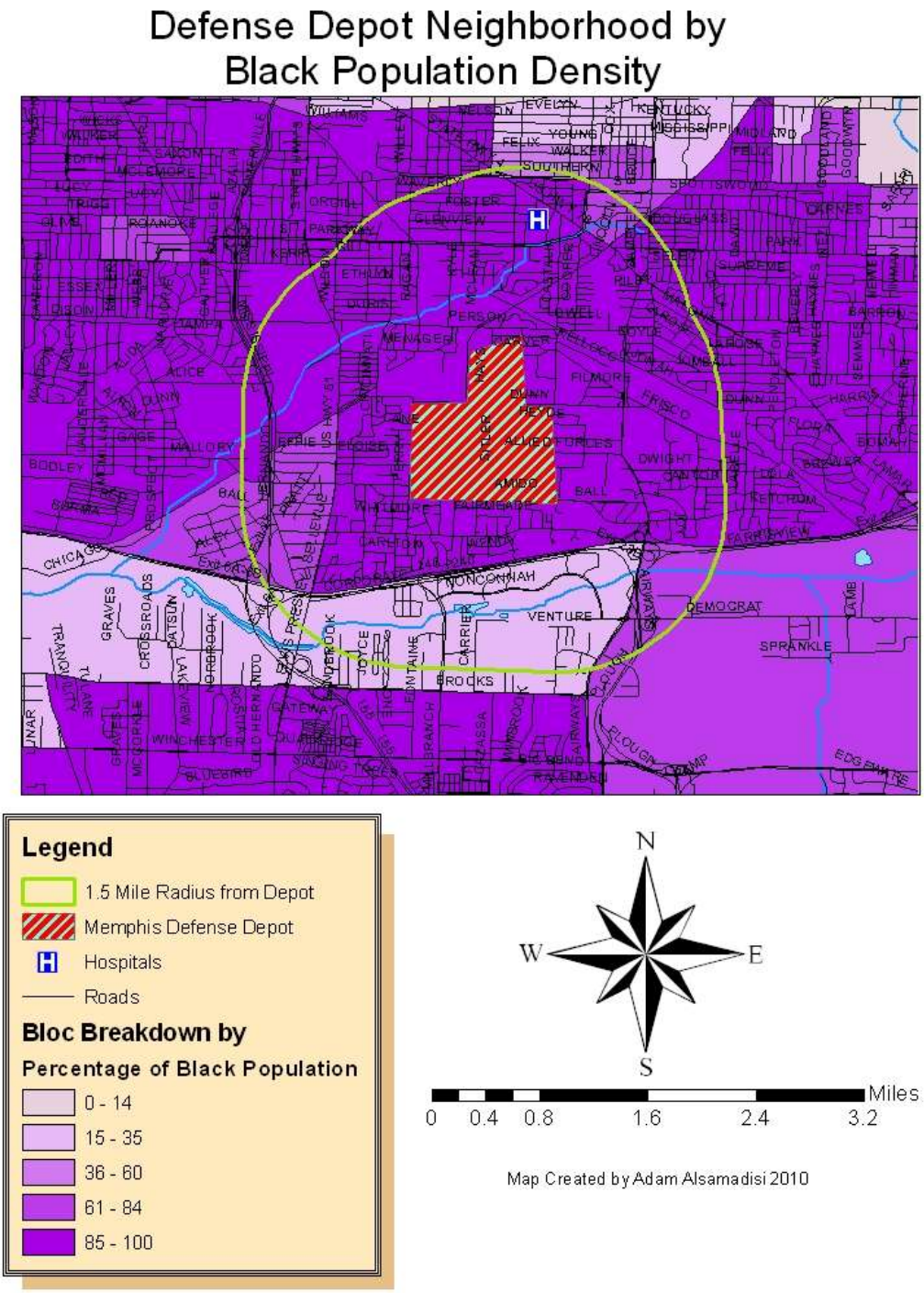


Figure 2. Population of African-Americans and Location of Hospitals in a 1.5-mile radius of the Depot

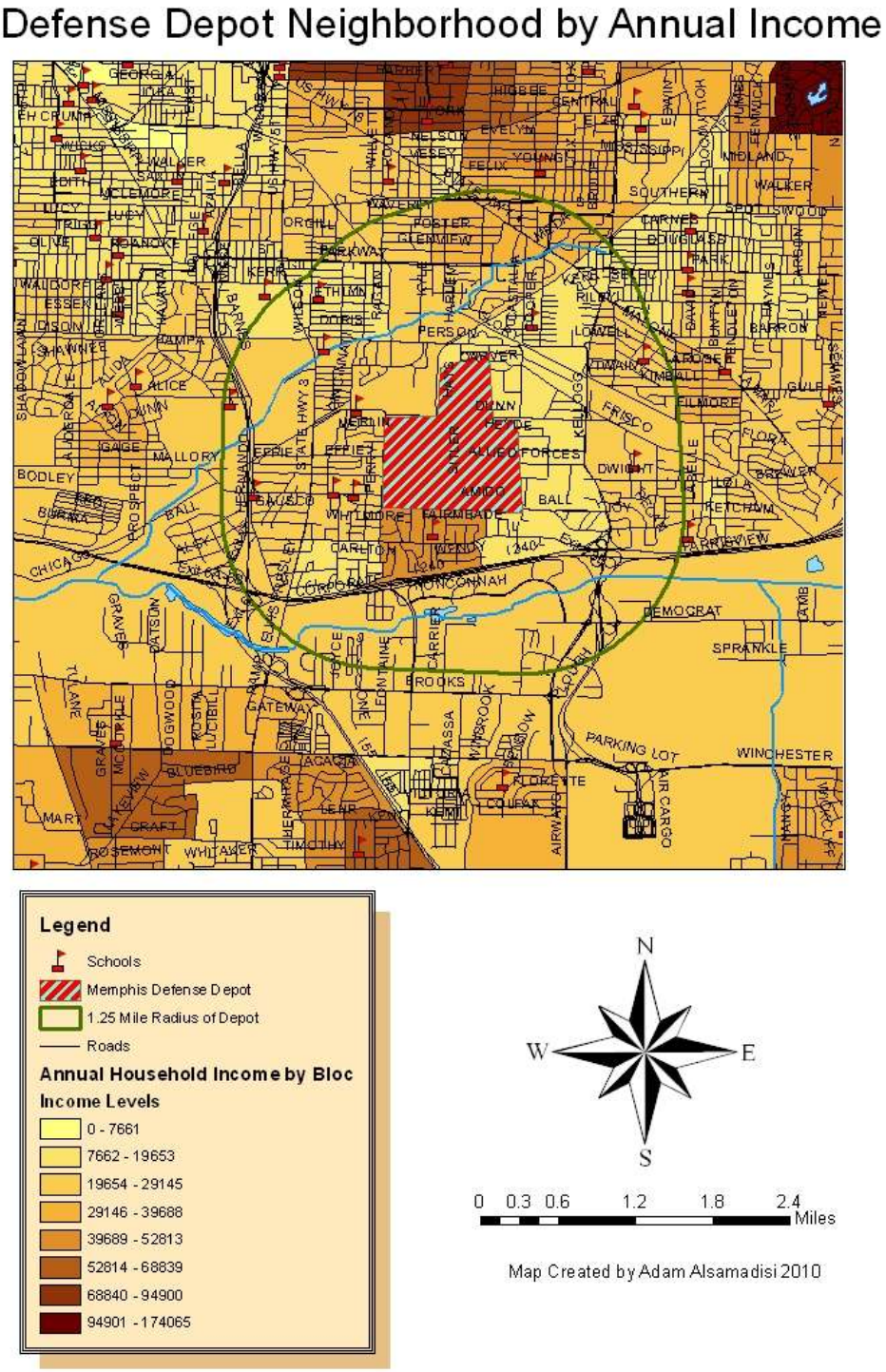


Figure 3. Income and School Locations within a 1.25-mile radius of the Defense Depot

Methods

In order to gauge the various factors of environmental justice, a survey was conducted to evaluate perceptions of vulnerability, susceptibility, and response. Three populations in the Memphis area were selected based on racial and income demographics and all were located within a two mile radius of a declared Superfund site (Table 1)

Name of Neighborhood	Nearby Superfund Site (Within 1- 1.5 miles)	Date of Operation of Site	Clean-up Completed	Racial Identity of Neighborhood	Income Class of Neighborhood
Defense Depot Neighborhood	Memphis Defense Depot	1941	-	Primarily African-American	Low Class
Collierville Neighborhood	Carrier Air Conditioning Company	1984	1995	Primarily Caucasian	Upper Class
Rossville Neighborhood	Rossville Metals Inc.	1979	1997	Caucasian and African-American	Middle Class

The primary study site was the aforementioned Defense Depot neighborhood, located within two miles of the Memphis Defense Depot. The Environmental Protection Agency (EPA) declared the Defense Depot of Memphis Tennessee (DDMT) a National Priority List Superfund site in 1992 because of the potential impact pollution from the United States military could have had on near-by resident's health.[8] The second site surveyed, as a control group for the combined effects of income and race, is located in Collierville, TN, a suburban community 30 miles east of Memphis. The Collierville community is within 2 miles of the Carrier Air Conditioner Factory and was declared a Superfund site by the EPA in 1984 because of the presence of

[8] Memphis Defense Depot. Site Summary and Profile. 30 March 2010. http://www.epa.gov/region4/waste/npl/npltn/memdeftn.htm

trichloroethylene in a nearby lagoon.[9] This community is mostly composed of upper class Caucasians. The third community surveyed as a second control for race only was in Rossville, TN. The neighborhood is within a distance of Ross Metals, a secondary lead smelter until 1992.[10]. The Defense Depot community can see their site through a cross- link fence, whereas woods blocks the Collierville and Rossville communities from seeing their respective hazards.

All surveys were conducted door- to- door, with participants selected at random. This method was employed to ensure diversity of participants with respect to age, gender, affluence, longevity of residency, and distance from the environmental hazard. This technique also fairly allotted members of a different race than expected based on the more prevalent race to be surveyed. Although the survey was originally simply handed out, to eliminate possible differences in literacy levels between communities, the survey was read to all participants.

At the beginning of the survey, a form was given to all participants thanking them for their willing participation and providing a brief definition of the study. It thus should be noted that participants completed the survey with a certain presumption on the issue, that their home was within a distance of a Superfund site, which was defined as an environmental hazard. At the end of the survey, in order to mitigate and address concerns that health was at any risk because of each community's corresponding Superfund site, an information sheet with more information about their Superfund site, local medical staff, and a contact for the Agency for Toxic Substance and Disease Registry was provided. Also note that none of the surveyors seemed to exhibit any overwhelming concern that their health was at any risk as a consequence of completing the survey.

---

[9] Carrier Air Conditioning Company. Site Summary and Profile. 13 July 2009. http://www.epa.gov/region4/waste/npl/npltn/carairtn.htm

[10] Ross Metals , Inc. Site Summary and Profile. 24 June 2010. http://www.epa.gov/region4/waste/npl/npltn/rossmetn.htm

Another factor of surveying that should be noted was the participation bias. Many participants were hesitant or unwilling to complete the survey and most participants seemed to be aware of environmental issues prior to this survey. This is not to say that all participants were debriefed on the issue, nor is it to assume that all participants had extensive knowledge about their particular site. However, many participants had a level of prior understanding about environmental health issues.

The survey posed many questions with the intention of using similarities and differences in answers to gain a general assessment of findings. While no information was recorded to identify participants, demographic information was collected including race, income and longevity of residency within that neighborhood. The length of time a resident lived in an area could be used to relate exposure to exhibited health problems. Questions designed to identify possible risks of exposure included type and frequency of activities such as fishing, walking, or swimming. Comparisons between responses to these questions may suggest what might make different participants more vulnerable to adverse health affects due to environmental circumstances. The questionnaire provided an open-ended area for participants to describe, "health problems that [they] believe are linked to environmental sources." The survey also asked if medical personnel confirmed the described health condition to avoid the possibility of self-diagnosis of health problems, or exaggeration of the seriousness of these health problems.

The survey also questioned whether or not the community felt they were susceptible to environmental injustices, based on factors such as race, income, political leadership, neighborhood history, local industry, and distance from environmental hazard. Although all survey locations were within a short radius of environmental hazards, the option of "No Susceptibility" was provided for all surveyors. This option, however, can stem from various

sources. For example, a member of the Collierville neighborhood may feel their community has no vulnerability simply because it is an upper class, well kept neighborhood. Alternatively, a member of the Defense Depot community may not be aware of potential pollutants within their neighborhoods facility simply because of lack of literacy and lack of concern for community news. A question was posed to all participants asking whether or not they believe their community would be prepared in the event of an environmental injustice. A correlative questions asked if they thought any of the following factors affected their likeliness of getting the necessary help: race, income, political leadership, distance from environmental hazard, local industry, and neighborhood history.

In order to re- evaluate the conclusions reached by Alp and Llorens (1999), the following segment appeared on each survey:

On a scale of 1-10, how much is it your responsibility as a community member to do something about an environmental hazard?

_____

What would you personally do?

_____

Rank from 1- 10 where motivation would come from? (Rank All That Apply)

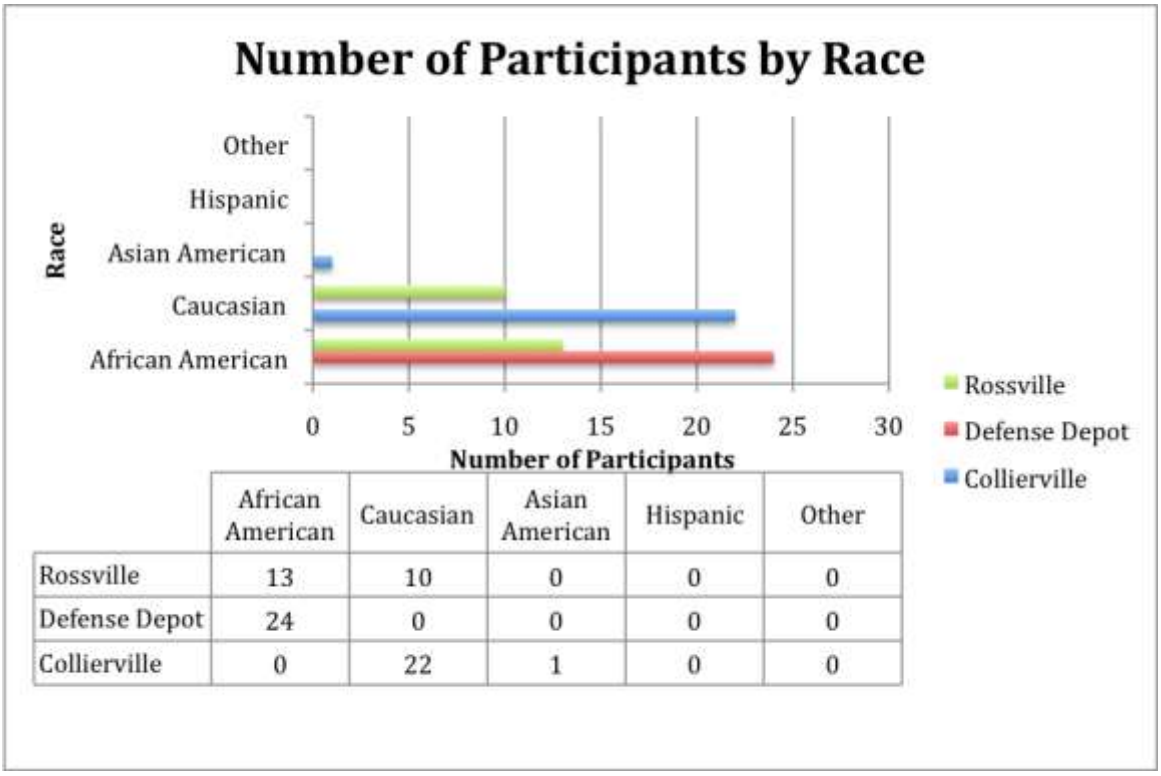
____ Your health
____ The health of your family
____ The health of your community
____ Increasing property value
_____ The principle of inequality (racial/social class/income)

These questions were posed in efforts to determine the level of activism felt by the individual and the motivation driving that action. “The Principle of Inequality” was often described by the surveyor to the participants as a hypothetical discussing the establishment of another population that is not as prone to environmental hazards based on their race, income, or

social class. These questions were used as a gauge to see any differences present as a result of the different incomes and races surveyed in respect to responsibility of community members. The open ended question "What would you personally do" allowed for different answers that are clearly different based on the community's demographics, as will later be discussed. The data collected could identify which neighborhoods had higher numbers of health problems perceived to be rooted in environmental hazards, and that data was used as evidence of more serious environmental injustice issues. Correlations between illness and income and/or race could be derived from these results in order to better understand environmental injustice issues.

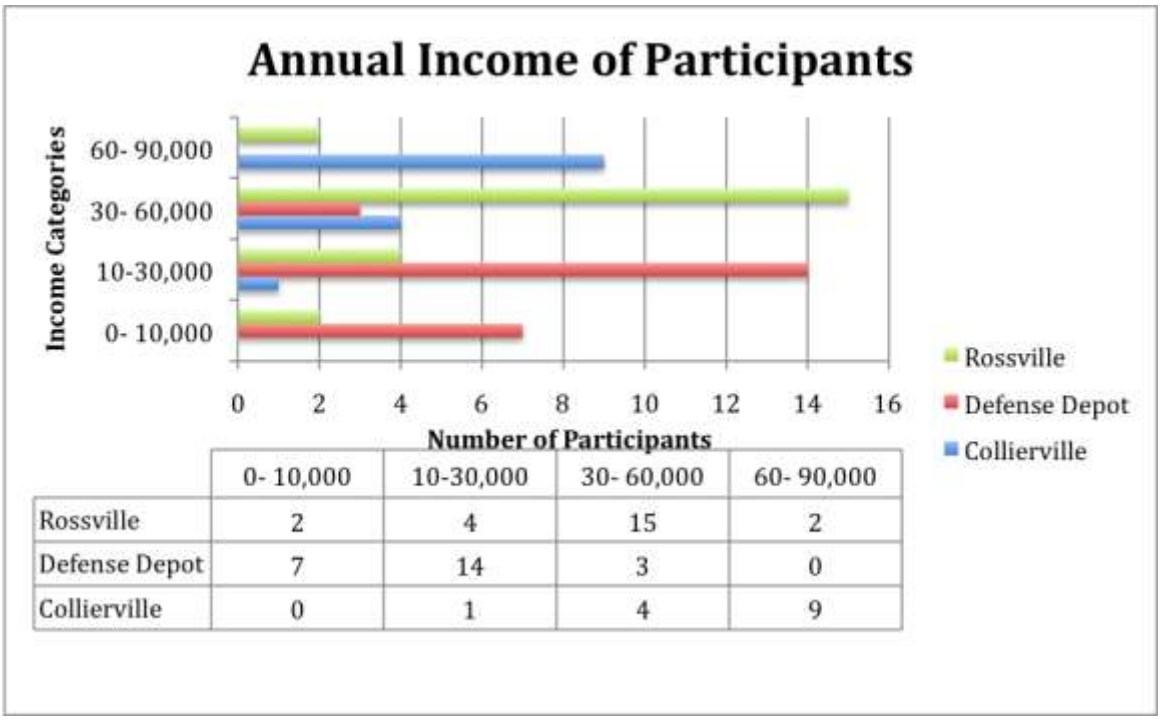
Results

The demographic identities of the surveyed areas are unique. Surveys were conducted July 11th, 12th, and 17th 2010. All three communities are distinct by demographic factors of race (Figure 4) and income (Figure 5). The Collierville sample group was composed almost entirely of Caucasians, with the exception of one Asian American participant, and the Defense Depot community participants were entirely African Americans. The Rossville community had a mixed participant group, with approximately an equal number of African-American participants and Caucasian participants. Reported annual household income showed the Defense Depot community participants had the lowest household incomes (just over half the participants reporting annual incomes <$30,000) and conversely, Collierville participants reported much higher annual incomes (78% of participants reporting annual incomes greater than $60,000. The Rossville Community reported incomes in between the other groups (65% reporting annual incomes between $30,000- $60,000), while only 13% of the Defense Depot community participants and 17% of Collierville community participants reported comparable incomes ($30,000- $60,000).



	African American	Caucasian	Asian American	Hispanic	Other
Rossville	13	10	0	0	0
Defense Depot	24	0	0	0	0
Collierville	0	22	1	0	0

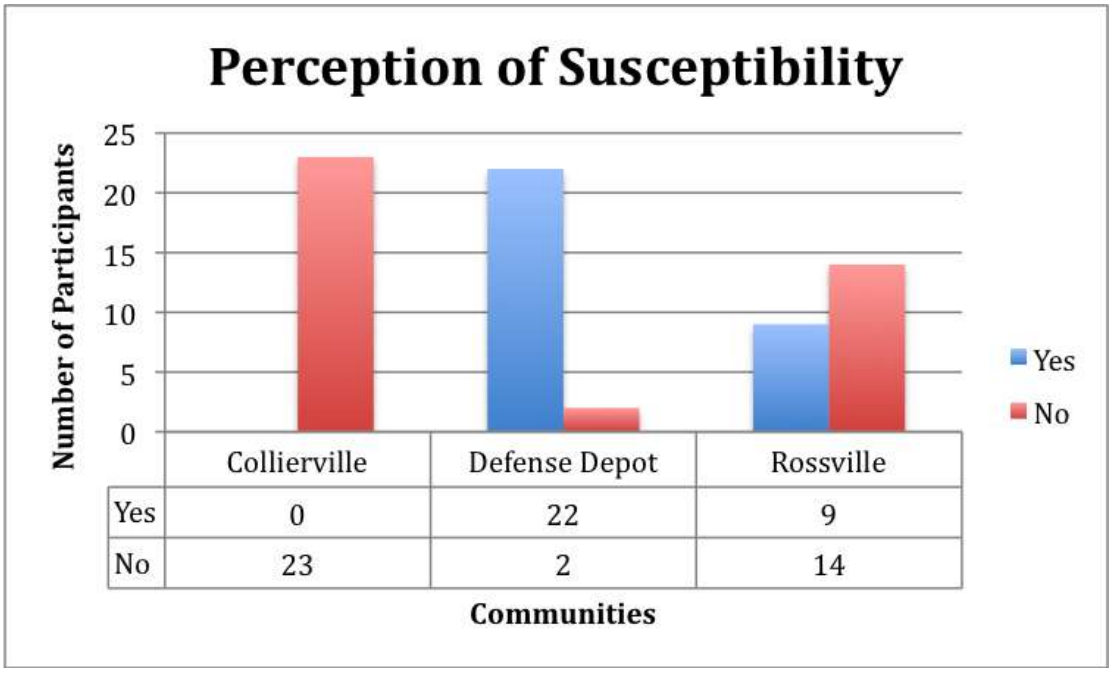
Figure 4 Racial Composition of Surveyed Areas



	0- 10,000	10-30,000	30- 60,000	60- 90,000
Rossville	2	4	15	2
Defense Depot	7	14	3	0
Collierville	0	1	4	9

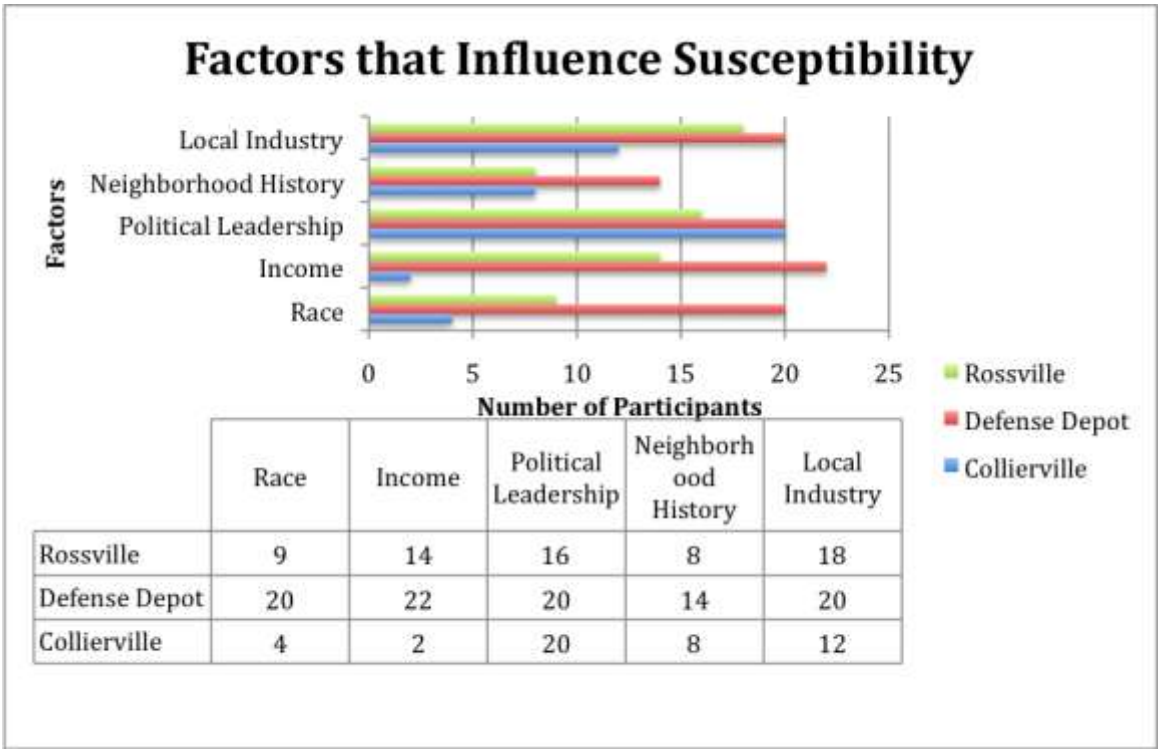
Figure 5 Average Annual Income of Participants

When asked if participants believed their neighborhood to be particularly susceptible to environmental injustices, those in the Defense Depot neighborhood, as a whole, believed their community was at risk for environmental injustice with only a few participants answering that they believed their community was not susceptible to any environmental hazard (Figure 6). None of the participants from the Collierville neighborhood believed their community was at any risk for an environmental hazard. The Rossville community was split in responses, but there was no link in racial identities to this perception of susceptibility. The proximity of the three communities to an EPA declared Superfund site was less than two miles. The Defense Depot neighborhood believed their race, political leadership, income, and local industry were the most determining factors to injustices, with neighborhood history and distance from environmental hazard considered to be less important factors (Figure 7). On the contrary, the Collierville neighborhood attributed most of their susceptibility to their political leaders and to a lesser extent local industry. The Rossville community believed most of their susceptibility is influenced by the political leadership, the local industry, and the income of the community. Although two participants from the Defense Depot community had stated their neighborhood was at no risk for environmental injustices, their responses indicated that both race, income, and political leadership all played a role in their susceptibility. Reasoning for their conflicting responses is unknown.



	Collierville	Defense Depot	Rossville
Yes	0	22	9
No	23	2	14

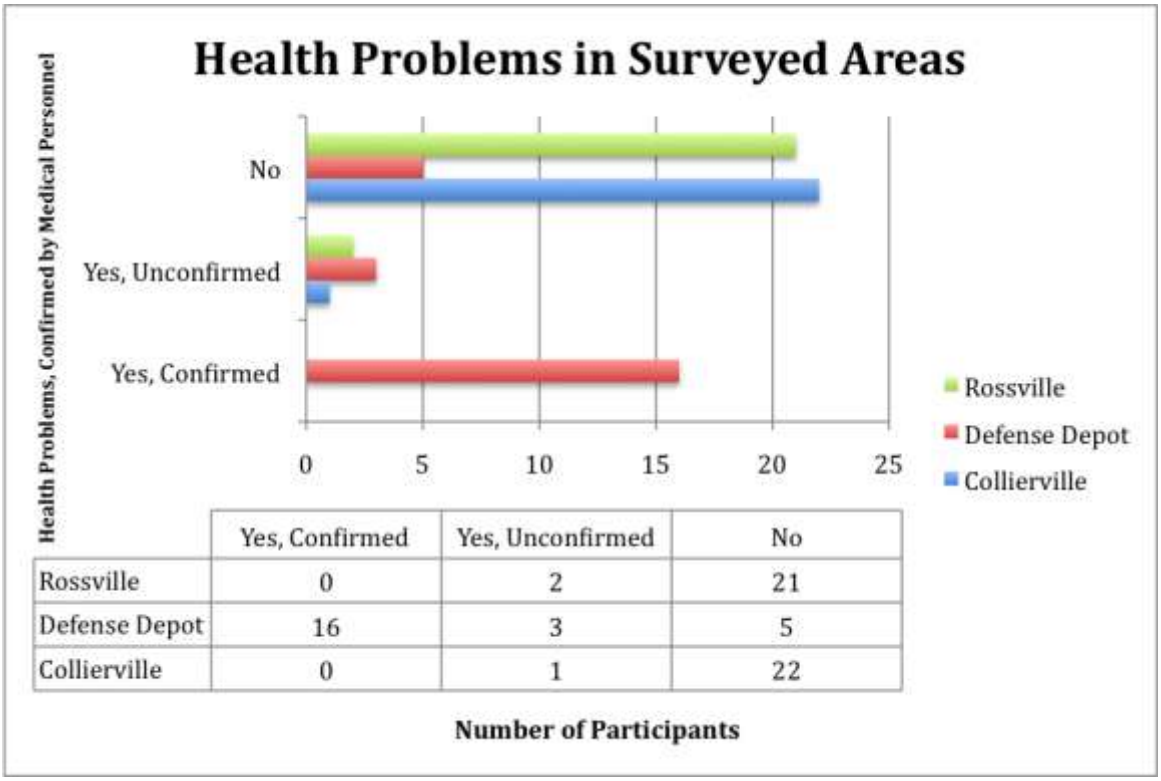
Figure 6 Perceived Susceptibility of Surveyed Areas



	Race	Income	Political Leadership	Neighborhood History	Local Industry
Rossville	9	14	16	8	18
Defense Depot	20	22	20	14	20
Collierville	4	2	20	8	12

Figure 7 Perception of factors that account for Susceptibility

While there were no confirmed health problems believed to be linked to environmental hazards in the Collierville community or Rossville community, a significant percentage of participants in the Defense Depot community answered they had suffered from confirmed health problems that they believed to be linked to environmental hazards (Figure 8). To clarify, the survey asked if medical personnel had confirmed the health problems, not the link to environmental circumstances. Unexpectedly, although there were more unconfirmed health cases in the Defense Depot community, there were slightly more unconfirmed health problems believed to be linked to environmental problems than confirmed health problems within the Collierville community and Rossville community. The participants reported having both an adequate healthcare plan and transportation to healthcare facilities, with only 5 out of 24 participants (21%) stating otherwise (Figure 9). The Defense Depot community is at a slight disadvantage concerning these factors.



	Yes, Confirmed	Yes, Unconfirmed	No
Rossville	0	2	21
Defense Depot	16	3	5
Collierville	0	1	22

Figure 8 Health Problems Believed as a

Result of Environmental Hazard

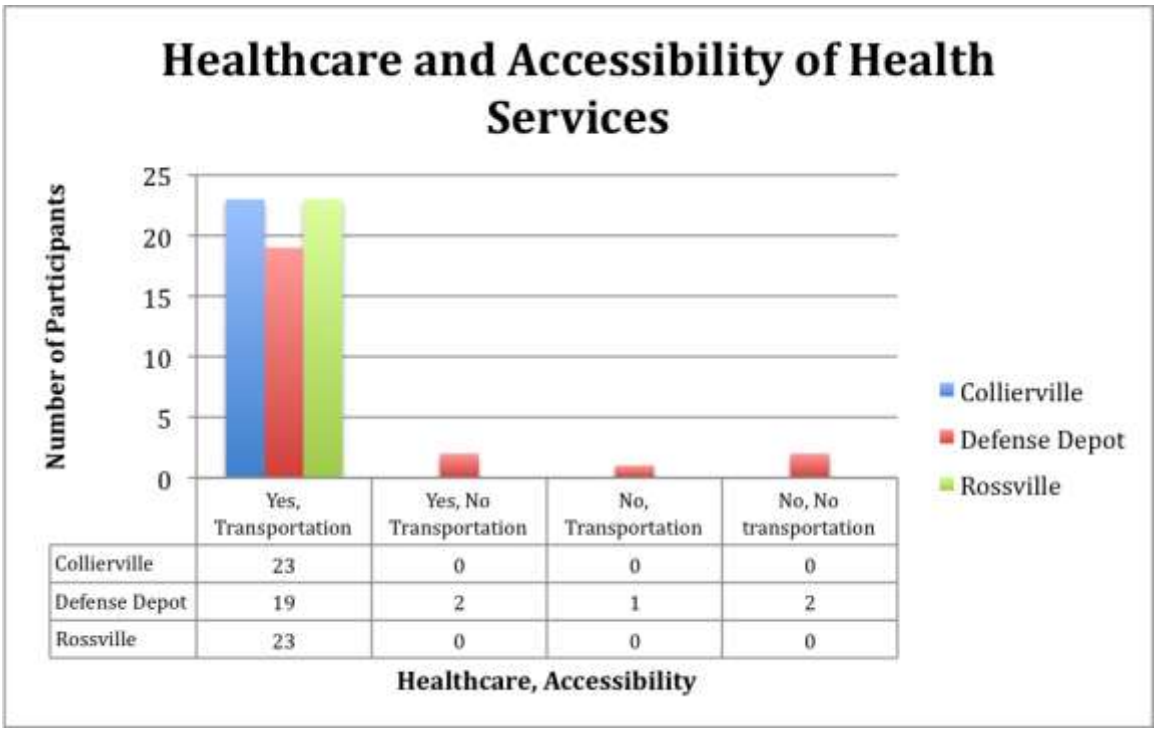


Figure 9 Availability and Accessibility of

Healthcare in Surveyed Areas

Questions designed to evaluate neighborhod perceptions about the effectiveness of community response in the event of another hazardous environmental situation arising also indicates significant differences between the perceptions held by these communities. The Collierville and Rossville participants both felt their neighborhood would be able to find solutions to environmental hazards, whereas the Defense Depot neighborhood felt their neighborhood would not be in a position to defend themselves against environmental injustices (Figure 10). When asked what factors affect whether or not their neighborhood would get the necessary help if faced with an environmental hazard, all three communities indicated that perceived lack of political leadership would play a major role in issues of environmental injustices (Figure 11). Participants in the Defense Depot and Rossville communities were much

more likely to indicate the racial makeup and average income of their neighborhood, and to a lesser extent interference on the part of local industry, would be a hinderance to getting help in issues of environmental hazards.

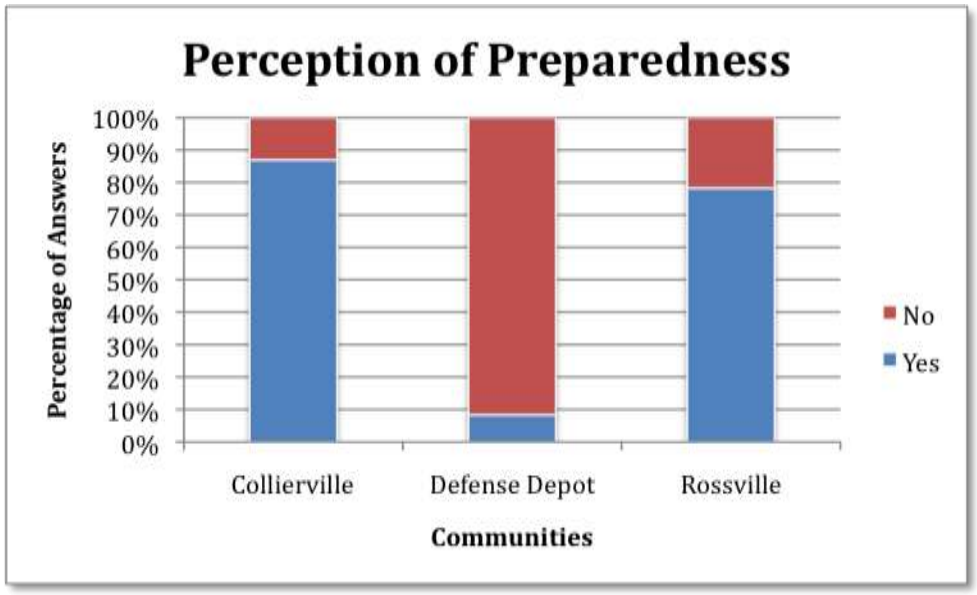
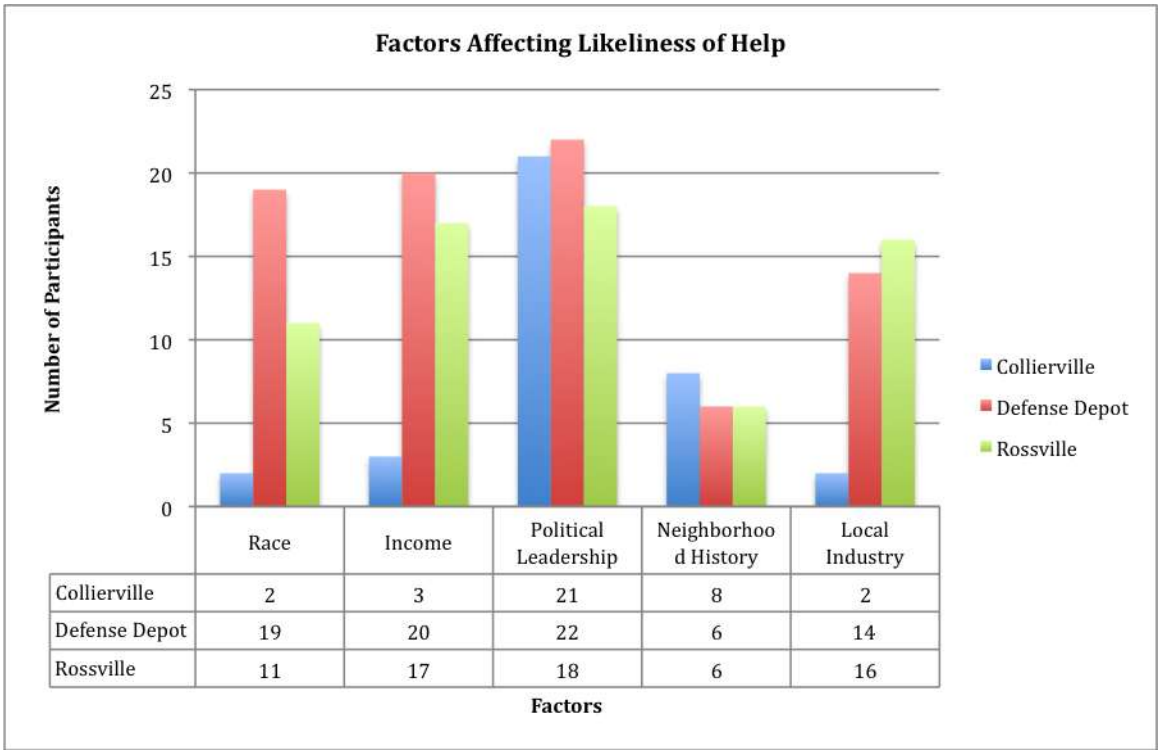


Figure 10 Perception of Neighborhood Preparedness to Environmental Injustice



	Race	Income	Political Leadership	Neighborhood History	Local Industry
Collierville	2	3	21	8	2
Defense Depot	19	20	22	6	14
Rossville	11	17	18	6	16

Figure 11 Factors perceived to make neighborhoods less likely to get the help needed

When participants were asked, on a scale of 1-10, how much responsibility they had as a community member to do something about an environmental injustice, with 10 indicating the most responsibility and 1 indicating the least responsibility, the Defense Depot community felt they were more responsible to act. The Defense Depot participant average was a response of 7.35 out of 10 (Figure 12) and the Collierville and Rossville community felt somewhat less responsible to act, with a participant average of 5.8 and 6.03 out of 10, respectively (Figure 12). When asked what factors would motivate their actions, the Collierville, Rossville, and the Defense Depot community gave similar responses (Figure 13). Driving factors in all communities included the health of the participants, that of the participant's family, and the health of their community. It is important to note the similarities between answers. The results show that motivation comes from a variety of sources, without on being particularly more

important than others. It should be noted, however that the average of responses of all factors were higher than the principle of inequality.

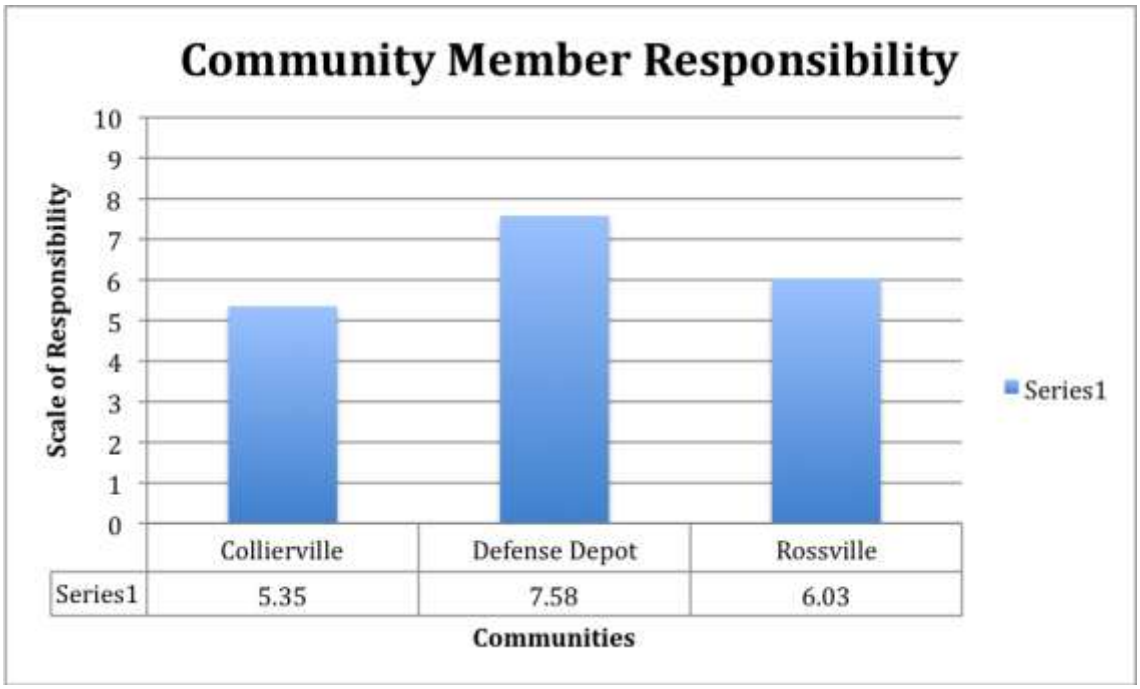


Figure 12 Average Believed Responsibility of Action towards Environmental Injustices

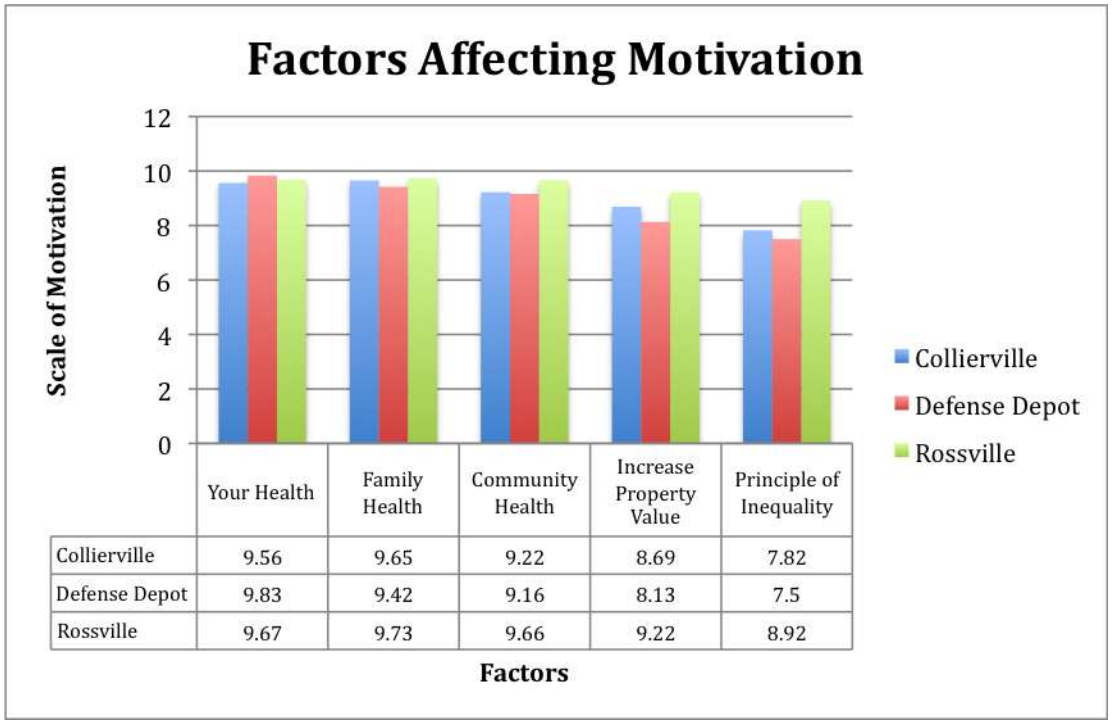
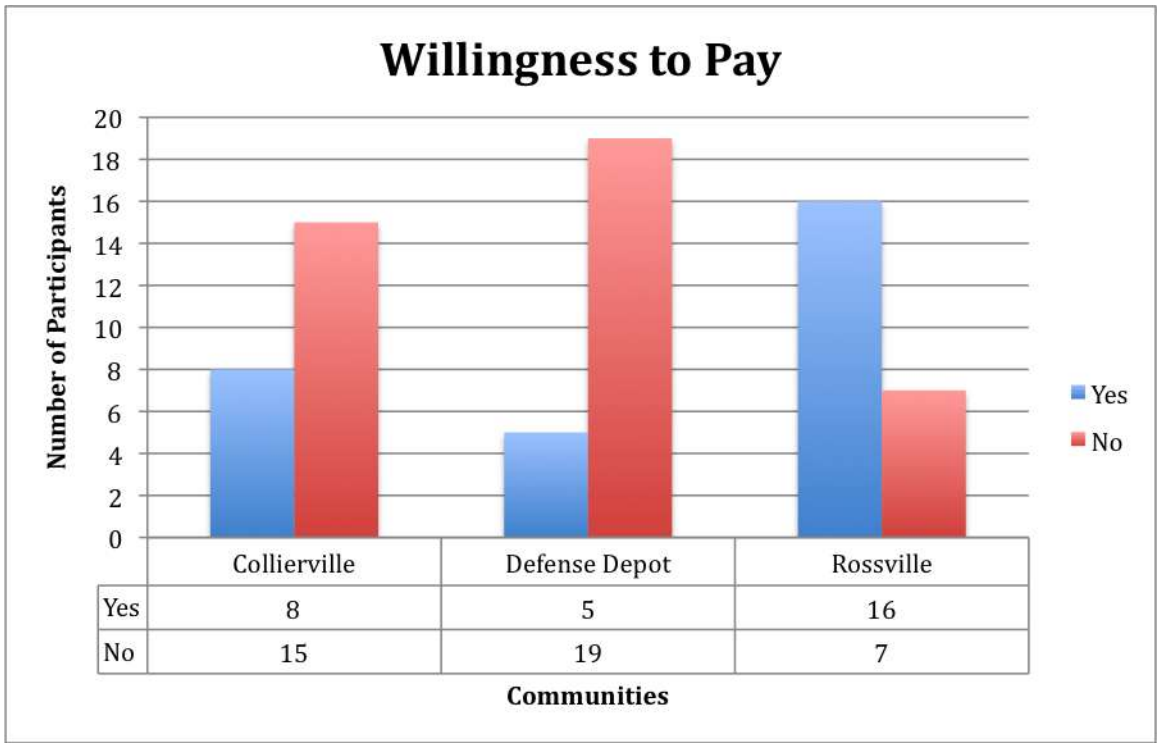


Figure 13 Factors that Affect Motivation for Action Against Environmental Injustices

Participants were also asked if they were willing to pay to lessen their vulnerability to environmental injustices. The results showed in general, that the majority of the populations in the Defense Depot and Collierville neighborhoods would be willing to pay (Figure 14). However, it is noteworthy that more Rossville residents would be willing to pay more than either of the other neighborhoods, and more Defense Depot residents are unwilling to pay than Collierville residents.

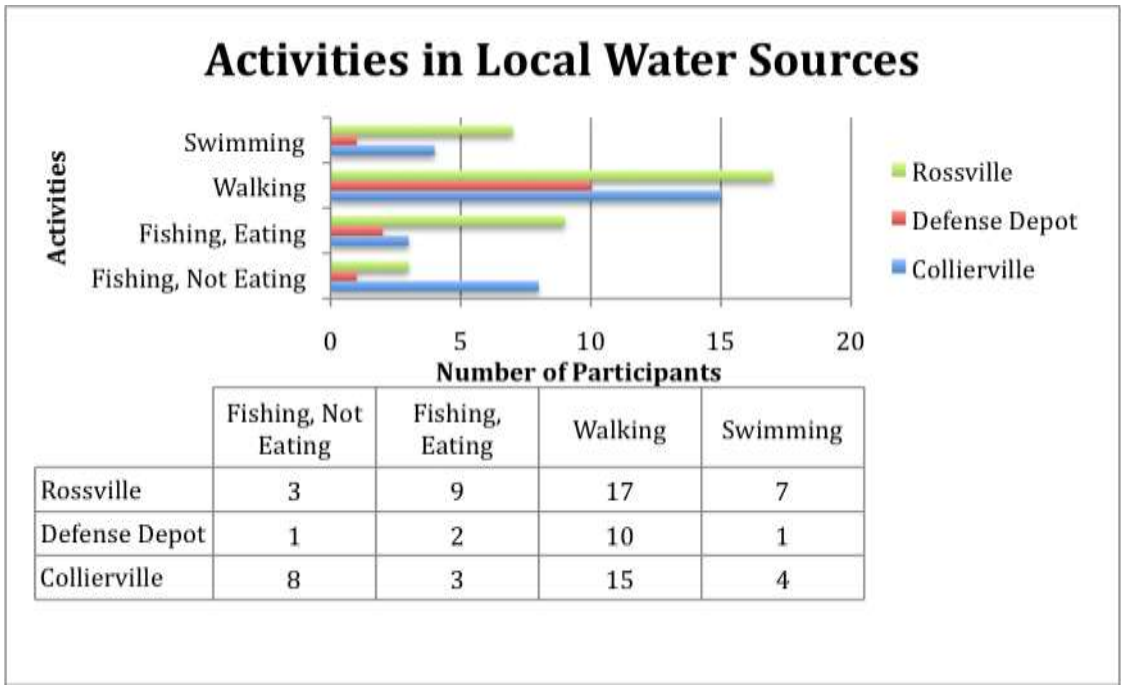


	Collierville	Defense Depot	Rossville
Yes	8	5	16
No	15	19	7

Figure 14 Willingness to Pay to Lessen Environmental Susceptibility

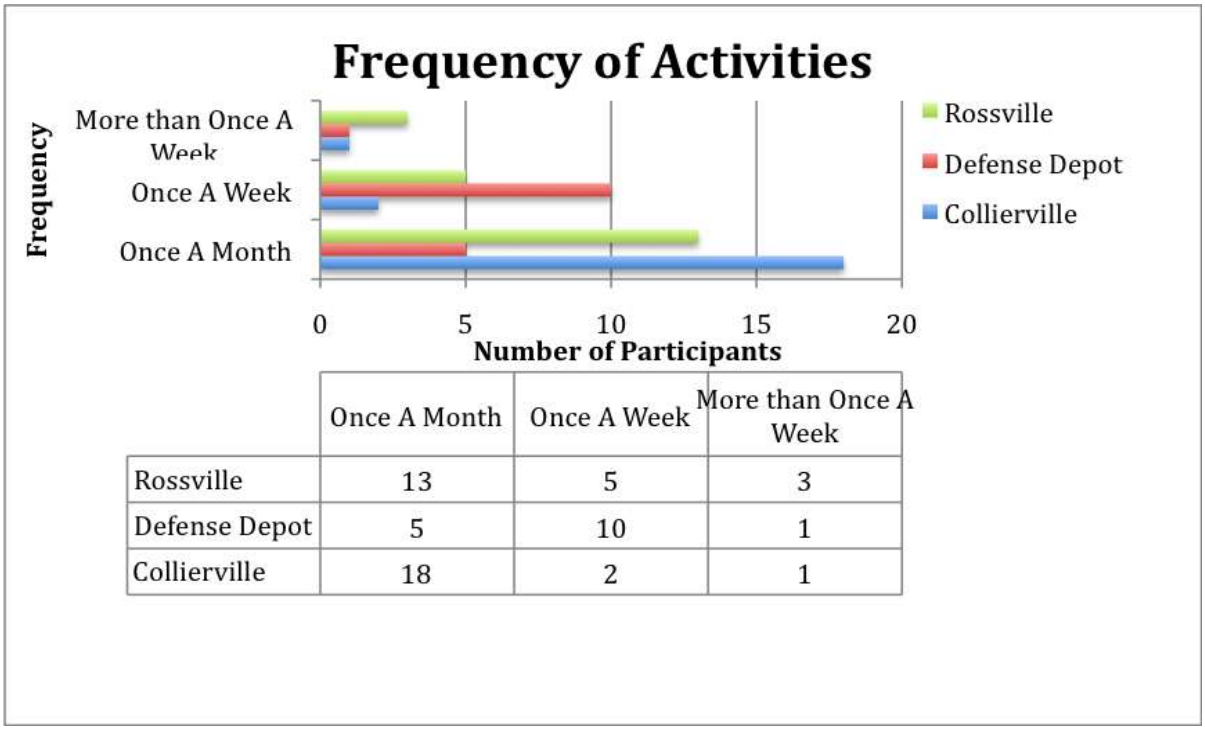
To evaluate potential sources of exposure to possible contaminants near the Superfund sites in these neighborhoods, questions were asked concerning activites that could potentially result in exposure, particularly regarding surface water bodies. As a whole, the Defense Depot community does not seem to utilize their water sources, with the most interaction being walking near water sources (Figure 15). However, results show that the Defense Depot participants who

did use their water sources, did so more frequently than Collierville and Rossville participants (Figure 16). Collierville residents use their water for fishing and swimming much more than the Defense Depot participants. Rossville participants seemed the most involved in activites in local water sources, including their activity and frequency. As far as frequency is concerned, most participants only partook in activities either once a week or more infrequent, however, 13% of participants from the Rossville community frequently partook in activities (Figure 16).



	Fishing, Not Eating	Fishing, Eating	Walking	Swimming
Rossville	3	9	17	7
Defense Depot	1	2	10	1
Collierville	8	3	15	4

Figure 15 Activites around Local Water Areas



	Once A Month	Once A Week	More than Once A Week
Rossville	13	5	3
Defense Depot	5	10	1
Collierville	18	2	1

Figure 16 Frequency of Activites

Discussion

On Exposure and Health Assessment Claims

The Agency for Toxic Substance and Disease Registry (ATSDR) claims that the contact expected by residents of the Defense Depot community is that of short term and infrequent dermal exposure. Because of the fear that contamination is worsened through biomagnification, neighborhoods are particularly fortunate that fish from the river are not considered a staple food choice. There is a fear, however, that residents are fishing in the river and then sharing their catches with their neighbors, thereby spreading contamination. This seems more likely because of the nature of African-American communities, which from experience with the community, is a very close knit community that stresses importance of community relationships. However, because the Defense Depot population participants did not respond fishing, and eating the fish, as a popular activity, and because no participants stated any of their activities were particularly

frequent, it seems this is not a likely harmful source of exposure. There is something to be said about the differences in the quality of life, however, that residents in Collierville are able to be part of activities around water sources in their area without concern for their health and Rossville residents are able to be very active in their natural environment. It is unknown whether the Defense Depot neighborhood participants choose not to participate in the activities because of the known pollution problem in their neighborhood. Assuming the participants knew about their contamination issue, the results should come as no surprise, which means they are being safe concerning exposure, but are unfairly faced to not use their environment compared to other neighborhoods.

On Perceptions of Risk

Concerning the perception of susceptibility of environmental injustices, none of the Collierville participants felt that they were at any risk, whereas a large majority of the Defense Depot participants stated their neighborhood was at risk. The Rossville community participants were divided in these responses. This result is surprising as all sites were within a reasonable distance of EPA declared Superfund sites. When asked what factored into their perception of susceptability, populations stated that they believed their political leadership played a major factor in susceptibility. For the Defense Depot neighborhood, and the Rossville neighborhood, however, the participants also felt their race, local industry, and income were factors that made their neighborhood more susceptible in encountering environmental injustices. As shown in Figure 5, the income levels of the three survey groups are fairly split, with lower incomes represented by the Defense Depot community, higher incomes represented by the Collierville community, and the Rossville community represented by middle class incomes. The one participant from the Collierville community who stated he was in the $10- 30,000 annual income

category also mentioned that he was retired. In terms of race influencing a neighborhood's perception of risks, results support the claim from the neighborhood's perspective, the Defense Depot neighborhood, predominantly African-American and low-income, was susceptible to environmental injustices because of the community's demographic identities. The fact that the Collierville residents did not feel susceptible to environmental injustices and were predominatnly Caucasian with much higher income levels that their perception is they are safer because of these identities, whereas Defense Depot residents felt their identity played a role in their vulnerability. This information mirrors the finding by the United Church of Christ Commission for Racial Justice, which traced the relationship between racial and economic composition of communities and the contaminated sites found in communities. The 1987 Commission Report stated that the most significant factor in predicting the likelihood of living in a hazarous waste site was race, with income stated as the next most important factor.[11] Although the argument can be made that those who may have answered that 'race' affected susceptibility was the African-American population in the Rossville community, the fact that they have a caucasians in their neighborhood as well speaks to an understanding that they are still at risk because of their race. In addition, if Caucasians were the ones who answered that race had affected their susceptibility, it stands to reason that they perceive African-Americans as more susceptible, or that Caucasians are just as susceptible to race. Because the Rossville community did not perceive race as a major factor that affects perceived susceptibility, it seems that race should be considered an independent factor in issues of environmental justice. Simply because there is an injustice

[11] Commission for Racial Justice, United Church of Christ, Toxic Wastes and Race in the United States, A National Report on Racial and Socio- Economic Characteristics of Communities with Hazardous Waste Sites. 1987

claimed by a minority group, it should not be assumed that the perceived injustice is solely based on a racial identity.

On Environmental Injustices

In response to this perceived injustice, it is important to note that environmental injustice is difficult to prove because of an assumption that claims are being made against a group believed to consider themselves superior. Both results and experiences while surveying suggest that claiming 'environmental racism' is as frequent, and arguably holding as little weight, as claiming 'racism.' Torres discusses the dangers of claiming enviornmental racism stating that a movement's emphasis on racism "seems designed to begin a relatively fruitless search for a wrong-doer, or in other words, the bad person with evil intent.[12] This is probably the wrong road to follow if real changes for the communities at risk are to be achieved."[12] Torres then argues that environmental racism should be considered a subcategory of environmental injustices based on a "system of racial subordination."[12] This research presented here supports Torres' comment. Although the Defense Depot neighborhood saw race as a factor that contributed to their perceived susceptibility to environmental injustice, they did not want that to be the catalyst for community action. Instead, they view factors based on personal and community relationships as factors being affected by environmental hazards, and choose to act with that motivation in mind. This may be attributed to a perception that the community cannot make a claim of racism that makes an impact. The American University Law Review states "As a community raises the charge of racism, the decisionmakers may paint themselves as the victims of the community's

---

[12] Torres, Gerald. *Changing the Way Government Views Environmental Justice.* St. Johns J. Legal Comment. 1994.

unfair accusation. In today's racial politics, many perceive the "victims" as those accused of racism, not the other way around."[13]

The Defense Depot residents also believed that their community's demographics made them less likely to get the help needed in issues of environmental injustices. Although the Superfund site cleanup was completed in 2004, complaints that the EPA has done nothing to help the community after the cleanup have been voiced through Doris Bradshaw, the head activist in the community.[14] Bradshaw states that "the community needs a healthcare facility that is easier to access, and knows how to handle environmentally induced sicknesses."[15] Given the fact that 2000 ATSDR conclusion admitted that "ATSDR was unable to determine whether exposures to contaminants from DDMT prior to 1989 could have resulted in health effects because of a lack of environmental data, "[10] it is this study's assessment that it is not an unreasonable request from the community to have personnel with knowledge of environmentally induced diseases available to them. The income levels of the residents around the Defense Depot community alone warrents a free healthcare clinic within a reasonable distance. The Rossville Community has a healthcare center within a mile and a half of the superfund site. According to an activist for the Defense Depot community, Terry Franklin, a member of the ATSDR study was asked to go through the community and hear their concerns. However, when the statements came out, none of the concerns or health risks were mentioned[16]. In addition, although the claim was made that there were no health risks, it is interesting to note that during cleanup efforts, large tents designed to

---

[13] Kaswan, Alice. Environmental Justice: Bridging the Gap between Environmental Laws and Justice. American University Law Review, 1997.
[14] Brooks, Peggy. Personal Interview. 12 July 2010.
[15] Bradshaw, Doris. Personal Interview. 10 June 2010.
[10] ATSDR: Agency for Toxic Substances & Disease Registry. Public Health Assessments & Health Consultations. USA Defense Depot, Memphis, TN. 2000.
[16] Franklin, Terry. Recorded Interview. 2004.

capture hazardous waste were put over all the sites and workers' uniforms were designed to protect against hazardous materials.[14] Even though this may have only been a precautionary measure, it still led the community to suspect that there were harmful chemicals in the soil. Community members cite this as reason to feel uncomfortable with the ATSDR's conclusions.

Reasons to feel uncomfortable with the accuracy of information from agencies, such as the ATSDR have been outlined in previous research. In an article discussing tbe inclusion of residents in issues of epidemiological health and environmental hazard conditions, Williamson et al (2005) concluded that conducting health assessments is difficult "because characterization of exposure is often limited or not available, the population currently living in the area is usually not the same population that lived there when exposure was occurring, and data may not be available for examination of rates of particular diseases in the area."[17] Thus, it seems that these results innately have a margin of error that the communities are not willing to accept. The circumstances of health assessments warrant skepticism that should be considered when dealing with communities, noting that concerns are borne from acknowledged faults in assessments.

It seems unlikely that the participants in the Defense Depot community were unaware of the environmental hazard in their neighborhood, as indicated by responses to the question that asked if they had suffered health problems that they believed to have a source in environmental issues. Again, although the results were separated by confirmation by medical personnel, this is not to say personnel definitively linked illnesses to an environmental problem, but the illness itself was confirmed. The perception that the environmental conditions caused illness is based on perception of the survey participant. Given the overwhelming amount of responses, it is unlikely

---

[17] Williamson DM, et al. Including Residents in Epidemiologic Studies of Adverse Health Effects in Communities with Hazardous Exposures. Journal of Environmental Health. 2005;67(6):23–28.

that all of the reported health problems are linked to the pollution in the Defense Depot neighborhood, however, that is not to say that many of them can be rooted in the condition of polluted areas. In discussing the strength of assocation between environmental conditions and adverse health effects, Nielsen and Jensen (2005) note :

> "The magnitude of the observed association is useful to judge the likelihood that exposure itself affects the risk of developing the disease, and therefore, the likelihood of a cause- effect relationship. Specifically, the stronger the association- that is the greater magnitude of the increased (or decreased) risk observed- the less likely that it is merely due to the effect of unexpected and uncontrolled confounding. This does not imply that a weak association cannot be causal, merely that it is more likely to exclude alternative observations."[18]

Therefore, this suggests that the correlation between health problems believed to be rooted in environmental conditions and the perceived environmental conditions should not be ignored. In addition, although the availability and accessibilty was thought to have been a problem to the Defense Depot community, it certainly seemed that healthcare is available for many of the participants. This supports the legitimacy of the responses that the medical personnel did in fact confirm healthcare problems.

On Responsibility for Action

Another aspect of the survey questioned how much responsibility, on a scale of 1-10, community members felt they personally had to take action in issues of environmental injustice case in their neighborhood. While the average for the Collierville community and Rossville community was only 5.35 and 6.03,respectively, Defense Depot participants ranked 7.35 out of 10. This difference is apparent for a variety of reasons. The Carrier factory and Ross Metals, Inc. were tested and chemicals were found, and so the Environmental Protection Agency noted the sites as National Priority List Superfund sites and they were cleaned up. The fact that these two

---

[18] Nielsen, Jesper B. and Tina Kold Jensen. "Environmental Epidemiology." Essentials of Medical Geology. Elsevier Academic Press. 2005.

corresponding neighborhoods did not feel susceptible suggests that the community did not involve themselves with efforts to have the area cleaned. To the contrary, the Defense Depot neighborhood had to endure many community meetings and involve themselves with the government and the Defense Depot in to have another cleanup of the area and another health assessment.[19] As this land was formerly operated by the US Department of Defense, there is a presumed amount of added resistance. These differences are apparent in the various answers given to the open- ended question: "What would you personally do if your neighborhood was faced with an environmental hazard?" While the Defense Depot neighborhood gave various responses including: 'Contacting the media,' 'get somebody to help out,' 'talk to government officials,' 'start a community cleanup,' and 'whatever it takes;' seven of the Collierville participants answered 'talk to the homeowners association.' The Rossville Community stated that they would have 'community meetings' and get involved with 'local government' to have the injustice resolved.

Concerning community involvement in communities affected by environmental injustices, the American University Law Review observes three reasons why communities do not act in response to environmental hazards. They are: 1) the concern that communities do not have the resources to get scientific expertise necessary to prove environmentally induced consequences on a community 2) communities do not have sufficient legal resources needed to get the full extent of benefits presented in environmental legislature and 3) although resources may be obtained, experienced personnel will overtake the process, which leaves the community residents as "disengaged bystanders."[20] These factors are present in the survey results which

---

[19] Sean Phillips. Personal Interview. 2004.
[20] Kaswan, Alice. Environmental Justice: Bridging the Gap between Environmental Laws and Justice. American University Law Review, 1997.

suggest the income levels of the community represent a disadvantaged community that would not be able to pay for expert, and thus credible opinions, and the lack of trust in effectiveness of political leadership suggests the community would not reap the full benefits of legal rights. Concern that experts would take over action has not been researched in this study. However, the fact that the Defense Depot community has been involved in the process of site remediation and raising awareness of the issues is evidence that the community has a vested interest in having their voice matter.

Concerning responses to questions which asked participants to rank from 1-10 where their motivation towards action would come from if faced with an environmental hazard in their neighborhood, it seems that there was not much difference between the three communities. It is notable that the principle of inequality, ranked as the lowest motivation source. While conducting the survey, it was apparent that both communities cared more about personal, family, and community health more than the concept that another community may have some sort of advantage based on demographics. In re-evaulating the conclusion by Arp III and Llorens, this study suggests the principle of inequality does not heaviliy weigh as a source of motivation for acting against an environmental injustice. The similarities in the answers, instead, should be stressed. Despite the various demographics, and their relative perception of being more advantaged, motivation against an environmental injustice grows concurrently as the health of the individual, the individual's family, and the community becomes at risk.

Concerning the willingness to pay of the communities, both the Defense Depot community and the Collierville community seemed unwilling to pay a tax to lessen vulnerability to environmental issues. It is important to note that while conducting the surveys, the Collierville community participants made comments along the lines of "We shouldn't have to pay for our

safety," whereas the Defense Depot community members made comments indicating that they were unable to pay a tax given their financial situation. More Rossville participants, however, were willing to pay a tax than unwilling, a result only observed in this community. Survey responses relating to the perception of environmental issues and income demographics stand in accord with these responses. Because the Collierville community did not perceive they were faced with an environmental hazard, the situation has not presented itself where the participants had to put a monetary value on safety from environmental hazards. It can be assumed that the same holds true for the Rossville community.

An economic study on willingness to pay by Flores and Carson (1997) concluded that environmental goods are considered an 'luxery demand.'[21] However, it seems that concerning environmental hazards, the good should be considered a necessity for those who consider themselves at risk for health affects.[21] The study concludes with the addage: "the rich man may buy proportionately more loaves of bread than his poorer brother, but this does not imply he is willing to pay proportionately more for the same loaf."[21] However, in issues of environmental justice, the poor man and the rich man are not typically gunning for the same loaf. In issues of environmental hazards the poor man is typically faced with more severe consequences if the he is unwilling, or unable, to pay. This research suggests that because of the perceived conditions of the various communities, while richer communities do not see a need to pay, and thus pays for environmental health as if it is a charity. Poorer communities cite the need to pay as contributing to their community as if it were a charity, however if not willing, or able to pay, the poorer

---

[21] Flores, Nicholas E. and Richard T. Carson. "The Relationship between the Income Elasticities of Demand and Willingness to Pay." Journal of Environmental Economics and Management. February 1997.

communities seem to have an individual community member obligation to help out in other ways.

Conclusions

The research presented in this study suggests that in viewing cases of environmental injustices, the perceptions of those claiming environmental injustices are based on a variety of factors. The first, susceptibility, is characterized by a variety of factors that seem to be based on the demographic identities of the community. Income and Race are both independent factors that, from the research, are not believed to be solely based on identity, but do factor into perceived vulnerability. The factors that motivate communities to act against environmental injustices are similar among many communities, and are impacted by the health of the individual, the individual's family, and the individual community- not the "perception of bias" as previously concluded by Arp III and Llorens. Concerning the Defense Depot Neighborhood, the primary testing site, it seems that the Agency for Toxic Substance and Disease Controls' statement on 'expected forms of exposure' is in accord with survey results. However, that is not to say that this report's assessment is that no environmental injustice is occuring in the area by the Memphis Defense Depot. This research sought only to understand the motivation behind environmental action, the perception of injustices and what factors impact this perception, the availibility of healthcare after environmental hazards affect a community, and the differences in perceptions among these neighborhoods. To conclude, it seems that certain areas and populations are more susceptible to environmental injustices and do perceive themselves as such, but the motivation of efforts of community members are similar among different populations, despite differences in efforts.