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Impact of Pollution on Marginalized Communities: Case Study of Omaha, Nebraska

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IMPACT OF POLLUTION ON MARGINALIZED COMMUNTIES: A CASE STUDY OF OMAHA, NEBRASKA

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Environmental justice has been a struggle within our country for years. The goal of Environmental justice is for the fair treatment and equal voice for every single individual regardless of race, income, gender, etc. There has been environmental injustice and racism in many cities, but this study focuses on Omaha, Nebraska. Key questions include: What are some specific pollutants that are prevalent in areas with differing racial majorities in Omaha? What are some of the health patterns in these areas and does it relate to environmental racism? How has Omaha reinforced environmental racism through city planning? Using the Climate and Economic Justice Screening Tool and the USDA Food Access Research Atlas, data was collected and analyzed to assess pollutant exposure and health outcomes in relation to race and income in three different census tracts with varying racial majorities. The pollutants identified were lead paint, waste facilities, diesel matter, traffic proximity, underground storage tanks and releases, and food insecurity. The findings reveal stark disparities in pollutant exposure and health defects, with areas with marginalized communities having higher levels compared to areas with majority white communities. Moving forward, continued research, education, and policy is needed to help create a more just and sustainable environment for everyone.

Introduction

Environmental Racism in Omaha, Nebraska

This thesis explores the intersection of environmental racism and its impact on marginalized communities in Omaha, Nebraska. Encompassing the broader context of race and minority groups, this research delves into the implications of pollution on vulnerable communities. By examining the localized issue of environmental injustice in Omaha, the study seeks to highlight how specific neighborhoods, predominantly occupied by racial minority groups, face disproportionate exposure to pollutants, adversely affecting the overall well-being and health of the community members (Mohai et al. 2009).

The research will concentrate on Omaha's neighborhoods with significant racial minority populations, conducting a case study of various factors influencing the lives of these marginalized communities through the Climate and Economic Screening Tool. This study aims to uncover the connections between environmental factors, such as specific prevalent pollutants, health patterns in these areas, and the corresponding impacts on community members. Key questions include: What are some specific pollutants that are prevalent in areas with differing racial majorities in Omaha? What are some of the health patterns in these areas and does it relate to environmental racism? How has Omaha reinforced environmental racism through city planning?

Residents of these racially diverse neighborhoods in Omaha encounter not only disparities in housing, nutrition, and education due to planning centered around systemic racism but also face heightened exposure to pollution and climate-related challenges. This exposure contributes to adverse health conditions, including respiratory issues, infectious diseases, and mental health challenges (Beech et al. 2021). Furthermore, the lack of environmental education

in these areas perpetuates unsustainable practices, such as increased food waste and inadequate recycling infrastructure, exacerbating the challenges faced by these communities. The research emphasizes the intricate relationship between race, socioeconomic factors, and environmental injustices, recognizing systemic issues and promoting awareness of how these intertwined systems contribute to unfavorable conditions for racial minority demographics. Given that these communities represent a vital part of our society, addressing environmental racism throughout our cities becomes imperative, necessitating meaningful change.

Defining Terms and Limitations

Starting, some terms need to be defined. Climate change is the shifts in temperature and weather patterns that recently human actions have advanced. A problem that coincides with climate change is pollution. According to an article by Lerner, pollution is the "presence in the environment of products of human activity which have harmful or objectionable effects" (Lerner, 1999, p.435). This pollution then plays a part in environmental justice and environmental racism because minority communities have the most exposure to these pollutants. Environmental justice is defined as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income concerning the development, implementation, and enforcement of environmental laws, regulations, and policies" (Environmental Protection Agency, 2023). This is to protect minority groups from environmental racism which is defined as marginalized groups facing inequality by being burdened by pollutants and hazards (Pulido 1996). Environmental injustice is prevalent in the United States which leads to negative health effects in areas that are labeled disadvantaged due to stereotypes throughout city planning and other government and corporate organizations. These marginalized communities are experiencing

pollution firsthand all over the world. Still, it is important to look at the local level to see specific examples of how race, income, and pollutant exposure affect individuals.

Literature Review

I. History of Environmental Justice

Environmental Justice has been a struggle within our country for years. Its goal is for the fair treatment of all people when it regards environmental law, policies, and development (Mohai et al. 2009). The start of this movement began in Warren County, North Carolina when the state wanted to dump 120 million pounds of contaminated soil in a county that had mostly African Americans. This led to mass protests and media nationally which then led to more recognition of the problem of environmental injustice (Mohai et al. 2009). More people investigated waste facilities, and the same problems were occurring all over the nation. African American communities were being left with hazardous waste disproportionately to white people (Mohai et al. 2009). This is something that was not the fault of the people living there, it is the fault of a system that is set up to exploit racism and socioeconomic issues all around the United States. More and more studies were researched and published, showing the correlation between communities of color to many pollutants. This leads to the issue of race and class.

Environmental racism goes along with this environmental injustice that these communities are experiencing. Environmental racism is the targeting of these individuals or communities based on race (Bullard 1994). This leaves African Americans and Hispanic groups with a higher risk of exposure to environmental risks like air pollution, water pollution, food deserts, etc (Beech et al. 2021). This occurs because of multiple reasons. One of these is residential segregation. Due to the New Deal, the Homeowners Loan Corporation was set up

within cities around the mid-1930s. This allowed a type of racism that was called redlining maps where they would racially discriminate and funnel all their investments into middle and upper-class white communities (Strand 2019). Although it became illegal during the Fair Housing Act of 1968, the system still allows for these racist practices to continue. When these minority communities are segregated like that, corporations and the government place waste and unwanted environmental risks into the neighborhoods.

An example of this was found in Houston in an area called Northwood Manor which contained a high majority of African Americans. In the previous years, it used to be mostly white residents but then the white flight made this community turn into mostly black. The city was proposing a waste site in 1971 when it was majority white and was denied due to the school nearby, property value, health hazards, and increased traffic (Bullard 1994). Now that it was majority black, the city fought even harder to place the waste site here. It was a trend the city was following because the other large waste sites were in predominantly African American and Latino neighborhoods (Bullard 1994). This is just one example of how residential segregation is affecting where negative policy is implemented.

White flight was a term that was mentioned in the previous example, but it is very prevalent in some of the issues in urban areas. When people started to leave these communities, they also took their wealth. This impacted the community economy which then in turn led to underfunding of their schools and local infrastructure. When the school systems have fewer resources, it leads to poorer education for the community members (Wade 2017). This, in turn, leads to kids that are dropping out of high school or not having enough funds to attend college. Because of the poor education, it leads to fewer people getting high-paying jobs. This results in poverty being almost forced into the same community and getting stuck in this poverty cycle

(Wade 2017). Since these communities are in this cycle, it is challenging to break free from that, and in turn, these neighborhoods are discriminated against and face harsh realities when environmental policies, corporations, and government are against them. This highlights the unjust practices that are in favor of the wealthier percentage of the United States. Instead of helping, many cities only further this discriminatory system by ignoring the issues that only further the disparities in economic growth, health, and education (American Psychological Association 2017). An example of this environmental racism, along with the waste facilities, is the creation of coal plants, lead plants, and food deserts. This can be seen in the case of Omaha, Nebraska. These officials place environmental risks that are likely to cause health defects on socioeconomic and racial minorities due to a cycle that has been created by the people in power. That cycle in which is almost impossible to beat.

II. Physical and Mental Effects

Being exposed to all these pollutants has detrimental effects on these individuals. The variables that are relevant to this case study of Omaha, Nebraska are air pollutants, lead pollutants, proximity to a waste facility, water pollutants, and food deserts. These are becoming a bigger problem around the world due to the increasing amount of urban growth. Starting off, a large part of the pollutant exposure is through the air. This pollution is prevalent because of the growing number of emissions from both cars and companies mixed with the conditions of wind and atmosphere (Kura et al. 2013). This air usually contains higher amounts of "sulfur dioxide, oxides of carbon, oxides of nitrogen, and particulate matter" (Kura et al., 2013, p.1). Because of these harmful pollutants, it leads to many degenerative health effects for individuals with higher exposure. The majority of these pollutants affect the respiratory system causing related illnesses, higher rates of asthma, and decreased lung function in children leading to cancer and premature

death. It can also get into the bloodstream and cause higher rates of heart attack, stroke, high blood pressure, and abnormal clotting (Kura et al. 2013). Air pollution also has been shown to correlate with mental health disorders due to the chronic diseases many of the victim's face. Another reason is it is forcing all these community members to stay inside to help avoid more physical damage to their lungs and heart (Sass et al. 2017).

Another pollutant exposure that is harmful to the residents that are coming in contact with it, would be lead. Lead exposure has come from a variety of sources from water pipes, exhaust, smelting plants, or chipping paint. The variety of these sources of lead exposure causes children and adults to inhale it and have it entered their bloodstream (Muller et al. 2018). This lead is extremely harmful to these young children which affects the nervous system and causes detriment to their brain development and neurotransmitters. This leads children to have cognitive problems which show itself in learning, health, and behavior problems. When looking at their health, there can be many severe problems like mental illness, convulsions, and renal failure (Muller et al. 2018). They are also more likely to have symptoms related to ADHD and have more aggressive behavioral issues. This allows them to be labeled as dangerous and affects their future behavior as an adult (Muller et al. 2018). The reason that this is allowed is due to these corporations place these products in areas with a majority African American or Hispanic race so they can blame the symptoms on other things besides the lead's side effects. This environmental racism allows for a disproportionate number of minorities to be facing all the physical and mental health effects specifically the children in the area (Muller et al. 2018).

The proximity a person is to a waste facility has been shown to have various negative effects. Waste and landfill sites have harmful chemicals that migrate off and can cause them to enter the bloodstream of individuals nearby. This can also affect the water and soil throughout

the neighborhoods in close proximity. Some of these health outcomes are cancer, chromosome changes, low birth weight, and birth defects (Vrijheid 2000). An example of this would be the study of the landfill of Love Canal, New York. In this example, there was dumping of waste materials and then proceeding to build a neighborhood and schools on top of it. This led to many chemicals throughout the air, soil, and surface water. Some of these chemicals included chlorinated hydrocarbons, acids, organic solvents, vinyl chloride, and so much more. Those infants and children had higher seizures, cognitive issues, rashes, irritation, abdominal pain, and other more severe symptoms. It led the mothers to have low birth pregnancies and birth defects (Vrijheid 2000). The exposure to many of these chemicals and pollutants is showing that they are affecting children more due to faster absorption rates.

Water quality can be affected in many ways for the residents of an area whether it be the quality of pipes or waste leaking into it, but the one that will be focused on in this study would be the leaking of underground storage tanks. The problem with these storage tanks is they cause a risk of contamination which affects the water quality which then affects the public health of those consuming that water. If the storage tanks do not receive the quality checks that they need, then it can lead to the water changing chemical composition and then becoming hazardous to people who drink it (Slavik et al., 2020). This means that this also needs to be thought about in the construction, design, and maintenance of it which is out of the hands of the people that are residing there and up to the government to keep in check as well as the producers of these water tanks. Many health risks are affected by the person's water quality. Just a handful of these include life-threatening diseases, pneumonia, intestinal infections, and health defects of newborn babies (Slavik et al., 2020).

The final health risk due to environmental injustices is food deserts. These food deserts prevent certain people from having access to healthy and affordable food. This is very prevalent in areas that have a higher percentage of minority groups or socioeconomic disadvantages—according to an article reviewing food desert literature, "areas characterized by low income and a high proportion of African Americans and Latinos had few supermarkets or chain stores per capita" (Beauluac et al, 2009, p.3). This is especially hard when these residents don't have any form of transportation and if public transportation is lacking. This leads to an increase in fast food that has poor nutrition only increasing health defects in these areas. Some of these physical effects include higher rates of obesity which then influences a lot of cardiovascular diseases higher cholesterol, blood pressure, and diabetes (Testa et al., 2020). The poor quality and nutrient- deficient foods only make it harder for these already disadvantaged groups to have a healthy life that is in their control.

By looking at the previous literature, it is clear that many of these pollutants and environmental injustices lead to many harmful factors for individuals living in disadvantaged areas. It can be assumed that facing all of these issues, will take a toll on the mental health of those individuals. All of these risk factors can be applied in the research of the case study of Omaha, Nebraska

III. Background of Environmental Injustice in Omaha, Nebraska

Omaha, Nebraska was founded in 1854 on the edge of the Missouri River. This city has been experiencing racism and environmental injustice throughout its history. This city has been facing residential segregation where the city is split up into North Omaha, South Omaha, and West Omaha. The North side of Omaha is predominately African American, the South side of Omaha is predominately Hispanic, and the West side is predominately white people. This

segregation was due to the White flight and the North Freeway that was built by the Federal Highway Act. They displaced people and those facing socioeconomic issues in the North side of Omaha (Bowling 2022). The North and South Side are also predominately low-income due to the education and housing systems put in place by the city. Without good education, these residents were left to stay in the same areas they grew up in perpetuating this cycle of poverty (Residential Segregation in Omaha, 2018).

Just a few of the environmental justice issues in Omaha include the coal plant and the lead superfund site. Starting with the coal plant, it was constructed in 1954 and has been polluting the air with toxins leading to some of the higher rates of asthma in Omaha. This plant was placed in a North Omaha neighborhood leading to more and more movements to ban this coal plant (Keenan, 2022). The other known environmental justice issue is a high amount of lead exposure. This issue was due to a lead smelting and refinery that worked in eastern Omaha. This ran from 1889-1997. This allowed for many of the lead particles to get into the air and make their way into the residential areas of North and South Omaha. This caused a lot of attention due to the health problems a lot of the children in the area were facing. The Environmental Protection Agency began to sample the area for lead exposure and decided to create a Superfund Site to help clean up this area in 2009 (Environmental Protection Agency). This project has been going on for years to try and help those who have been affected. More factors will be explored in the case study that plays a part in environmental racism and pollutant exposure, but those are the more publicized ones that affect the area.

Methods

I. Sample and Data

This research will be done as a case study of the area of Omaha, Nebraska looking at three different neighborhoods on different sides of Omaha with varying racial groups. The data was collected through the Climate and Economic Justice Screening Tool, which is utilizing census tracts across the state to assess community disadvantage (Climate and Economic Justice Screening Tool 2022). Another data section will be done through the USDA Food Access Research Atlas to see the food availability in these different tracts (*USDA ERS - Food Access Research Atlas*, n.d.). A qualitative analysis will be done of the data concerning the statistics regarding the percentage of disadvantage each area faces.

The tool that will be used during this study to explore census information about the different areas in Omaha is the Climate and Economic Justice Screening Tool. This tool was created due to Executive Order 14008 by President Biden based on "Tackling the Climate Crisis at Home and Abroad" (*Tackling the Climate Crisis at Home and Abroad*, 2021). In this order, it directed the Council on Environmental Quality to develop this interactive map that uses the census as well as datasets that indicate different burdens and if they are considered disadvantaged because they are overburdened (*Tackling the Climate Crisis at Home and Abroad*, 2021). The different categories of burdens are climate change, energy, health, housing, legacy pollution, transportation, water and wastewater, and workforce development. This tool uses census tracts from 2010 and they define these tracts as a small area with around 1,200-8000 people (Climate and Economic Justice Screening Tool 2022). The Climate and Economic Justice screening Tool highlights disadvantaged areas. They establish disadvantaged groups by whether they are intensely affected by at least one of the previously stated burdens or are in a federally recognized tribe (Climate and Economic Justice Screening Tool 2022). The goal of this screening tool is also to look at where more funding needs to go.

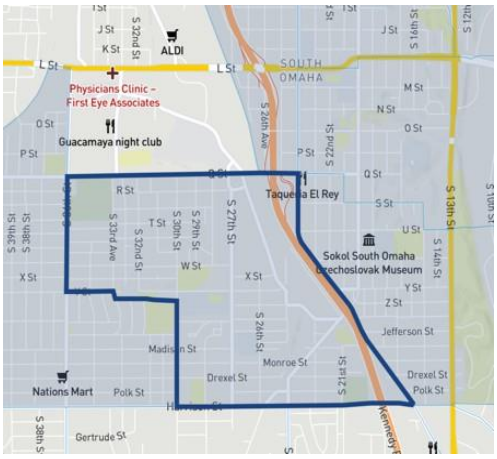
The Climate and Economic Justice Screening Tool segmented data into various categories, encompassing environmental and physical well-being. There will be a comparative analysis of each of the communities' percentage of exposure in each community along with their disadvantage which is affected by if they are considered low income. The criteria for low income were defined as household income at or below 200% of the Federal poverty level (Climate and Economic Justice Screening Tool 2022). Three areas, representing West, North, and South Omaha, were selected using the screening tool. They were selected by finding similar percentages of age groups (similar percent under 10, middle age, and elderly) to try to not base health defects on certain susceptibilities that come with differing ages. The areas selected are depicted below from the Climate and Economic Justice Screening Tool:

A. North Omaha

Census tract: 31055001100 (Climate and Economic Justice Screening Tool 2022).

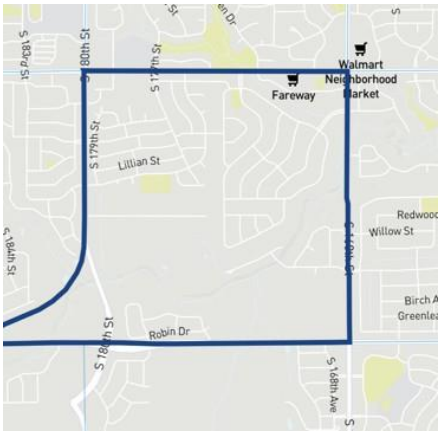
B. South Omaha

Census Tract: 31055002900 (Climate and Economic Justice Screening Tool 2022).



C. West Omaha

Census Tract: 31153010627 (Climate and Economic Justice Screening Tool 2022).



The first examination will be of population size and racial demographics aimed to identify instances of environmental racism in Omaha. Subsequently, an examination of the direct pollutant issues in the area will be identified. The datasets selected for analysis include lead paint prevalence, proximity to waste facilities, exposure to diesel matter, traffic proximity and volumes, and occurrences of underground storage tanks and releases, which are just a few of the categories in this tool (Climate and Economic Justice Screening Tool 2022). Along with that, there will be a section if the area has food access issues (*USDA ERS - Food Access Research*

Atlas, n.d.). The way it will be measured is if they are low-income and are more than ½ miles away from the nearest supermarket (*USDA ERS - Food Access Research Atlas*, n.d.). It will be labeled as LI and LA at .5 miles. The investigation proceeds to assess the health impacts on the area, with a focus on gathering data concerning prevalent health issues. The chosen datasets encompassed the percentages of individuals diagnosed with asthma, diabetes, heart disease, and an overall low life expectancy in the area. The synthesis of these sources will help to provide an understanding of the relationship between the environmental factors and health outcomes that can apply to these minority communities.

II. Procedure

Environmental racism can be seen when minority groups face added exposure to pollutants in communities compared to neighborhoods with predominately white groups of people (Pulido 1996). This exposure that minority groups face may lead to an increase in health defects (Testa et al., 2020). To prove this is applicable in the Omaha area, there needs to be an observed difference in these independent areas. The most important difference is that North and South Omaha, predominately black and Hispanic groups, differ from West Omaha, predominately white, in terms of pollutant exposure and health defects. Using the Climate and Economic Justice Screening Tool, a table will be provided for each census tract with the three categories labeled: Population, Pollutant Exposure, and Health Defects. From there, the data tables will be described in order to examine the difference among the certain tracts in each area of Omaha.

There are several assumptions in this research. Firstly, the study assumes that the data of the census tracts are accurate and reliable when comparing them. Another potential assumption would be that the greater amount of health defects in these communities would partially stem

from the greater exposure to environmental pollutants. Since this study is focused on this one area, the data found from previous studies may be too generalized to apply to this smaller area. Some of my limitations include the data from the census tract being from 2010. This means that it might only partially reflect the current dynamic of this area so another study would need to be done when the data gets updated. With an understanding of the interconnected challenges coming from climate change, race, and their effects on the mental and physical well-being of the citizens of Omaha, Nebraska, it is important to look into existing literature to understand the complex relationship. By exploring the influence of poverty and race, it may show a correlation to people's health.

Results

After looking at the data from the Climate and Economic Justice Screening Tool, all the data has been compiled into three tables for each census tract. The census tracts will go from West Omaha, North Omaha, and then South Omaha. The hypothesis is that the communities with higher amounts of minorities in the community will be exposed to higher amounts of pollution and therefore have higher health defects. The two communities of higher minority levels will be compared to the control of the population of a census tract in West Omaha. If there is a difference in these populations, it may show the potential of environmental racism and its health factors in certain census tracts in Omaha. Below is the data for the census tract in West Omaha.

Table One

Census Tract 31153010627 (West Omaha)					
Population		Pollutant Exposure (percentage exposed)		Health Defects (percentage affected)	
Pop. Total	4859	Lead Paint	4		
% Under Age 10	24	Proximity to waste facility	27	Asthma	1
% White	87	Diesel Matter exposure	27		
% Black	0	Traffic proximity and volumes	21	Diabetes	1
% Hispanic	3				
% Low Income	2	Underground storage tank and releases	27	Heart Disease	1
Identified as disadvantaged	No	LI and LA at .5 miles	No	Low Life Expectancy	28

Adapted from Climate and Economic Justice Screening tool. (n.d.). Climate and Economic Justice Screening Tool. https://screeningtool.geoplatform.gov/en/#3/33.47/-97.5

In this population the majority of the community is white, approximately 87%. Along with that this census tract only had 2% that were low income, and they did not identify this tract as disadvantaged. The pollutant exposure shows that they have relatively low exposure rate in all the different categories and are not in the Low Income and Low Access of the food desert qualifications. In their pollutant exposures all are less than 30% exposure to their population. It can also be observed that the health defects in the neighborhood are extremely low with asthma, diabetes, and heart disease being 1% of the population. After seeing the control of the census groups, the next table will contain the information of the census tract in North Omaha.

Table Two

Census Tract 31055001100 (North Omaha)					
Population		Pollutant Exposure (percentage exposed)		Health Defects (percentage affected)	
Pop. Total	3204	Lead Paint	71		
% Under Age 10	24	Proximity to waste facility	48	Asthma	95
% White	16	Diesel Matter exposure	50		
% Black	63	Traffic proximity and volumes	97	Diabetes	95
% Hispanic	13				
% Low Income	93	Underground storage tank and releases	97	Heart Disease	67
Identified as disadvantaged	Yes	LI and LA at .5 miles	Yes	Low Life Expectancy	94

Adapted from Climate and Economic Justice Screening tool. (n.d.). Climate and Economic Justice Screening Tool. https://screeningtool.geoplatform.gov/en/#3/33.47/-97.5

In this census tract, it can be seen the population has a majority population of African Americans, approximately 63%. This group has an extreme change in the population type compared to the previous and is identified as disadvantaged. When looking at the pollutant exposures, most of the percentage exposed was double and even tripled for some categories compared to Table One. The most notable exposures are the lead, traffic proximity and volumes, and underground storage tank and releases which are the highest among this census tract. They are also considered low income and low access regarding the food access in the area. When looking at the health impacts, all of them are higher than average. The most notable in this census tract is the asthma, diabetes, and low life expectancy.

Table Three

Census Tract 31055002900 (South Omaha)					
Population		Pollutant Exposure (percentage exposed)		Health Defects (percentage affected)	
Pop. Total	5589	Lead Paint	91		
% Under Age 10	21	Proximity to waste facility	59	Asthma	87
% White	16	Diesel Matter exposure	47		
% Black	21	Traffic proximity and volumes	54	Diabetes	88
% Hispanic	56				
% Low Income	94	Underground storage tank and releases	90	Heart Disease	60
Identified as disadvantaged	Yes	LI and LA at .5 miles	Yes	Low Life Expectancy	78

Adapted from Climate and Economic Justice Screening tool. (n.d.). Climate and Economic Justice Screening Tool. https://screeningtool.geoplatform.gov/en/#3/33.47/-97.5

In this population, the majority race is Hispanic, approximately 56%, with the second highest race being black at 21% of the community. When looking at the pollutant exposure the most notable is lead paint at 91% exposed and following that is underground storage tank and releases exposing 90% of this population. They are also at a low income and low access area in regard to the food access at .5 miles. Their health defects are also all above half the population being exposed. The highest of these health defects that the census tract is experiencing is Asthma at 87%, Diabetes at 88% and Low life expectancy at 78%.

To compare these three different regions more easily, the data above has been put into three different bar graphs. The three different sections are population information, pollutant

exposure, and health defects. They are then split up into the three census tracts that were chosen: West Omaha, North Omaha, and South Omaha.

Figure One

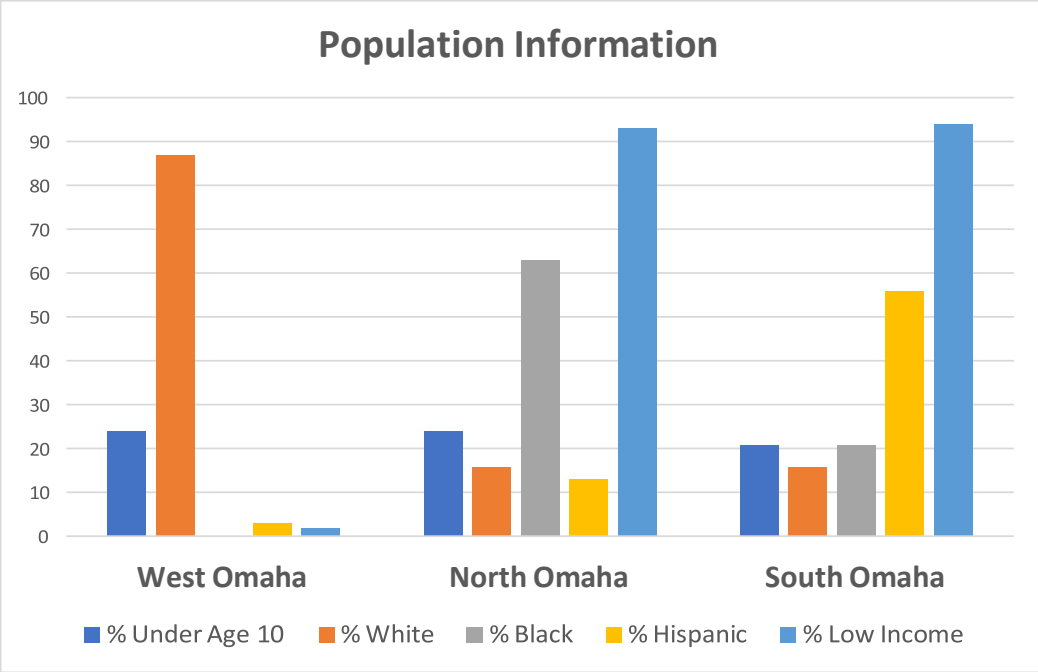


Figure Two

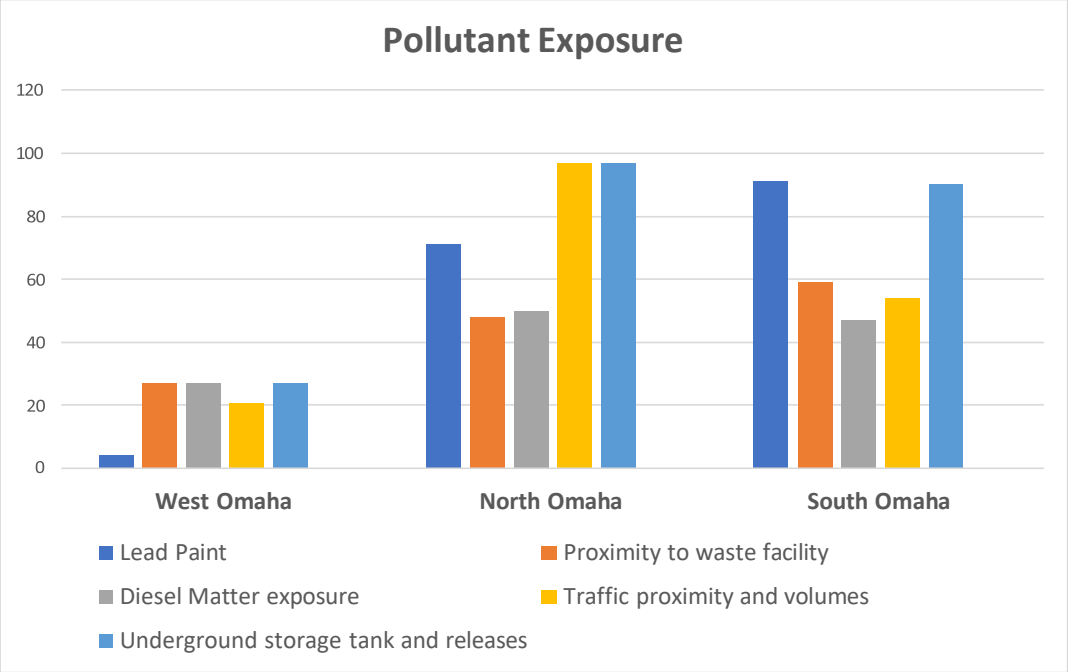
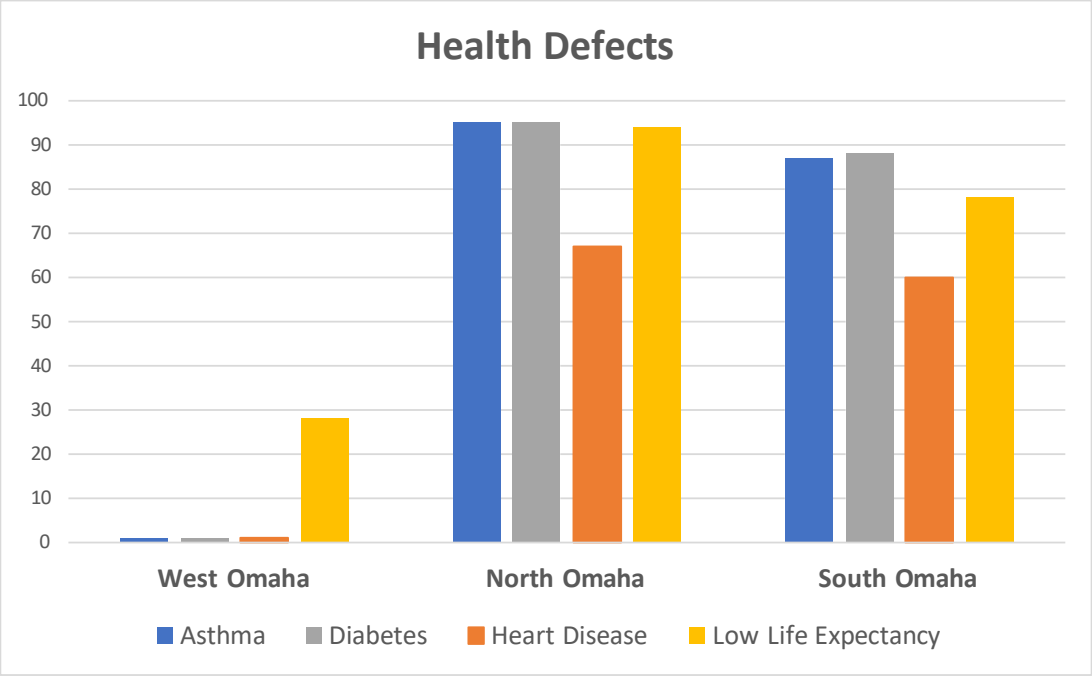


Figure Three



Regarding the quality assurance and measurements of this data, all of these statistics have been taken from the Climate and Economic Justice Screening tool with the most recent census tract data. It was then reorganized into different sections for each neighborhood, so it is easier to compare the population information with the pollutant exposure and health defects. Then a description of the population was provided to show the difference in the different tracts.

Discussion

The research questions stated previously were: What are some specific pollutants that are prevalent in areas with differing racial majorities in Omaha? What are some of the health patterns in these areas and does it relate to environmental racism? How has Omaha reinforced environmental racism through city planning?

Starting with the specific pollutants that are prevalent, it was found that these included high amounts of lead, proximity to a waste facility, diesel matter exposure, traffic proximity, and

underground storage tank and releases. Another factor that was included was the low income and low access to a grocery store. When looking at these pollutants, the percentage of those exposed was higher in the census tracts of North Omaha and South Omaha. When communities are at higher risk to these pollutants it can lead to higher health defects as discussed in the literature review.

Doing a deeper dive into the health problems in this area showed that there was an extreme difference in the West Omaha census tract compared to North and South. Looking at the previous tables, West Omaha's health problems of asthma, heart disease, and diabetes are only 1% of the population. That is a drastic difference compared to the 65-95% range that North and South Omaha had. These areas are showing extremely high rates of these health defects. One factor that may contribute to these high rates is the number of pollutants that these communities are disproportionately facing. As previously mentioned in the literature review, air pollutants are shown to have an increase in a populations asthma, lung disease, and heart disease rates (Kura et al. 2013). With the data showing a higher exposure rate for North and South Omaha, these two factors might be linked. Another bigger pollutant of these two areas is the underground storage tank and releases. These can easily go without routine checking and leads to various amounts of life-threatening diseases (Slavik et al., 2020). If the tanks are hazardous and poisoning the residents, it can contribute to the low life expectancy that is listed in the data sets. In West Omaha, low life expectancy affects approximately 28% of the population. In south Omaha it affects 78% and in North Omaha it affects 94% of the census tract. The lead in the area influences cognitive development along with a variety of health problems (Muller et al. 2018). Like that, waste facilities have harmful chemicals that can enter the bloodstreams of individuals nearby. Some of the health outcomes include cancer, chromosome change, and birth defects

(Vrijheid 2000). These both contribute to the area's low life expectancy percentage. This is calculated by seeing how much impact all the pollutants would have on a person and the average length of life. Low life expectancy affects double and even triple of the populations with higher amounts of minority groups. Along with that, the low income and low access to food can lead to diabetes because they are not getting the healthy and nutrient rich food that could be available to them. This can be seen in North and South Omaha.

Now looking into the final question of how Omaha has reinforced this environmental racism issue into the city planning this could be the case. As previously stated, Environmental racism is the targeting of these individuals or communities based on race (Bullard 1994). When it is paired with city planning, it has led governments to put hazardous environmental health risks to communities with higher minority groups. Omaha's history in redlining and unfair acts, like the Fair Highway Act, show the disregard for people of color and their livelihood. This Highway Act displaced many people of color who were just making their way to owning property. Along with that, Omaha's redlining is what segregated the different racial groups into different sections of the city that furthered this cycle. It then led to the degradation of the communities when all the money was funneled into the wealthier white communities. The funding left these communities with poorer resources and lacking quality education which led them into this cycle of poverty where they are unable to leave their neighborhood. The Fair Highway Act and redlining show the city's history of non-listening to people of color and their community's voice. That and the lack of funding in the areas led to these pollutants to be placed on the African American and Hispanic communities. In North and South Omaha, they have overall a higher exposure to pollutants with a higher amount of black and Hispanic groups. Knowing the effects of the poverty cycle that play a factor in this environmental racism, the many contrasting factors that North and South

Omaha census tracts have been exposed to only furthers the idea that this infrastructure is negatively affecting minority groups.

Conclusion

This study was made to address and explore the environmental justice issues that are in Omaha, Nebraska. It was looking to shed some light on disparities in pollutant exposures and the potential relation to health defects across three different neighborhoods. This research was looking to understand causes and implications of environmental racism and its burdens that minority communities can face. Using the Climate and Economic Justice Screening Tool and the USDA Food Research Atlas, the data was gathered and analyzed for three different census tracts in the North, South, and West Omaha regions. Each census tract brought in a different demographic with differing exposures and health landscapes. These tools showed that North and South Omaha, with majority black and Hispanic communities, were facing a disproportionate amount of pollution compared to West Omaha, majority white communities. It was also found that North and South Omaha were in an area with low income and low access to food. This then led into looking at some of the health problems that these people are facing. North and South Omaha had an extreme amount of health defects compared to West Omaha. This data can show a potential correlation between the demographics, pollutant exposure, and health.

This research wanted to find the specific pollutants prevalent in each area, health defects related to these pollutants, and how Omaha has reinforced environmental racism through city planning. The health defects that were most prevalent were high amounts of lead, proximity to a waste facility, diesel matter exposure, traffic proximity, underground storage tank and releases, and the food deserts. After finding these, the areas with higher pollutants also had higher health

defects and low life expectancy. Seeing how the census tracts that have communities that have been continuously marginalized are the ones that are facing these higher exposures, it may indicate that Omaha's city planning and funding has only furthered environmental racism in the area.

Based on the results found from this study, there is a need for further research looking into the connections between socioeconomic, systemic racism, environmental policy, and other things that can perpetuate inequities for different communities. Regarding this study specifically, adding more census tracts in each of the sections of Omaha could further show this potential correlation. This could also move to look in specific cases of these health defects to have further research connecting health problems to these varying pollutants. Overall, there needs to be an increase in education that can lead to environmental decision making to help decrease the many exposure communities are facing. If the study were to be done again, I would work to add in more census tracts or conduct surveys with people in the community to see if they are experiencing these pollutant exposures and how they believe it is affecting them. Overall, this study shows how we need to further research and work to solve environmental racism and this disproportionate exposure.

References

Beaulac, J., Kristjansson, E., & Cummins, S. (2009). A systematic review of food deserts, 1966-2007. Preventing chronic disease, 6(3), A105.

Beech, B. M., Ford, C. L., Thorpe, R. J., Bruce, M. A., & Norris, K. C. (2021). Poverty, racism, and the public health crisis in America. *Frontiers in Public Health, 9*. https://doi.org/10.3389/fpubh.2021.699049

Bowling, C. (2022, July 19). *Digging up the Roots on Omaha's Housing Segregation*. The Reader. https://thereader.com/2022/07/18/digging-up-the-roots-on-omahas-housing-segregation/

Bullard, R. D. (1994). Environmental racism and invisible communities. West Virginia Law Review, 96(4), 1037-1050.

Ethnic and racial minorities & socioeconomic status. (2017, July 21). *https://www.apa.org*. https://www.apa.org/pi/ses/resources/publications/minorities

Lerner, D.N. (1999). Pollution, scientific aspects. In: Environmental Geology. Encyclopedia of Earth Science. Springer, Dordrecht. https://doi.org/10.1007/1-4020-4494-1_262

Hickman, C., Marks, E., Pihkala, P. P., Clayton, S., Lewandowski, R. E., Mayall, E., Wray, B., Mellor, C., & Van Susteren, L. (2021). Climate anxiety in children and young people and their beliefs about government responses to climate change: a global survey. The Lancet Planetary Health, 5(12), e863–e873. https://doi.org/10.1016/s2542-5196(21)00278-3

Keenan, J. (2022, September 3). *LiveGreen: Environmental justice in Omaha*. Newsroom. https://www.unmc.edu/newsroom/2021/02/16/livegreen-environmental-justice-in-omaha/

Kura, B., Verma, S., Ajdari, E. B., & Iyer, A. (2013). Growing Public Health Concerns from

Poor Urban Air Quality: Strategies for Sustainable Urban Living. *Computational Water Energy and Environmental Engineering*, *02*(02), 1–9. https://doi.org/10.4236/cweee.2013.22b001

Mohai, P., Pellow, D. N., & Roberts, J. T. (2009). Environmental justice. Annual Review of Environment and Resources, 34(1), 405–430.

OMAHA LEAD | Superfund Site Profile | Superfund Site Information | US EPA. (n.d.). https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.Cleanup&id=0703481#bkground

Residential segregation in Omaha. (2018, September 6). Omaha Social Project. https://omahasocialproject.wordpress.com/stratification-social-class-and-race/residential-segregation-in-omaha/

Sass, V., Kravitz-Wirtz, N., Karceski, S. M., Hajat, A., Crowder, K., & Takeuchi, D. T. (2017). The effects of air pollution on individual psychological distress. *Health & Place*, *48*, 72–79. https://doi.org/10.1016/j.healthplace.2017.09.006

Shrestha, R. (2023). *CEQ's Climate and Economic Justice Screening Tool Needs to Consider How Burdens Add Up*. World Resources Institute. https://www.wri.org/technical-perspectives/ceq-climate-and-economic-justice-screening-tool-cumulative-burdens

Slavik, I., De Oliveira, K. R. F., Cheung, P. B., & Uhl, W. (2020). Water quality aspects related to domestic drinking water storage tanks and consideration in current standards and guidelines throughout the world – a review. *Journal of Water and Health*, *18*(4), 439–463. https://doi.org/10.2166/wh.2020.052

Strand, P. (2019). The invisible hands of structural racism in housing: our hands, our responsibility. University of Detroit Mercy Law Review, 96(2), 155-186. goes into work being done

Tackling the climate crisis at home and abroad. (2021, February 1). Federal Register. https://www.federalregister.gov/documents/2021/02/01/2021-02177/tackling-the-climate-crisis-at-home-and-abroad

Testa, A., Jackson, D. B., Semenza, D. C., & Vaughn, M. G. (2020). Food deserts and cardiovascular health among young adults. *Public Health Nutrition*, *24*(1), 117–124. https://doi.org/10.1017/s1368980020001536

United Nations. (n.d.). *What is climate change? | United Nations*. https://www.un.org/en/climatechange/what-is-climate-change *USDA ERS - go to the Atlas*. (n.d.). https://www.ers.usda.gov/data-products/food-access-research-atlas/go-to-the-atlas/

Vrijheid, M. (2000). Health effects of residence near hazardous waste landfill sites: a review of epidemiologic literature. *Environmental Health Perspectives*, *108*(suppl 1), 101–112. https://doi.org/10.1289/ehp.00108s1101

Wade, Oscar, White Flight and the Endless Cycle of Poverty for Urban People of Color in America (April 1, 2017). European Journal of Academic Essays 4(4): 141-145 , Available at SSRN: https://ssrn.com/abstract=3044184