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# An Analysis of the Association between Food Insecurity and Violent Crime in Georgia in 2020

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ABSTRACT

AN ANALYSIS OF THE ASSOCIATION BETWEEN FOOD INSECURITY AND VIOLENT CRIME IN GEORGIA IN 2020

By

Shawn R. Finnerty

July 26th, 2023

INTRODUCTION: Ten percent of Georgia households reported being food insecure between 2018 to 2020, and 3.8 percent of Georgia households with children reported being food insecure. These prevalence rates of food insecurity represent a 1.3% and 1% increase from data collection between 2008 and 2010 for Georgia households and children, respectively. A WalletHub study found that from the beginning of 2021 to the beginning of 2023, Atlanta saw the third-largest increase in homicide rates.

AIM: This study examines the relationship between food insecurity and violent crime, including murder, robbery, and rape in Georgia, controlling for various socioeconomic factors.

METHODS: The 2020 county-level violent crime data from the Georgia Bureau of Investigation Uniform Crime Reporting (UCR) Program, the 2020 county-level food insecurity data from Feeding America Map the Meal Gap data, the 2020 county-level data on Georgia population health outcomes and demographics from the University of Wisconsin Population Health Institute, and the U.S. Census Bureau were used for this study. Pearson correlation and linear regression analyses were conducted to determine the degrees of linear associations between food insecurity and violent crimes.

RESULTS: There were statistically significant positive correlations and associations between food insecurity and murder, rape, and robbery in Georgia, controlling for median household income, unemployment level, and lack of insurance.

DISCUSSION: The strong association between food insecurity and violent crimes observed in this study suggests the need for public health action to address food insecurity. Policymakers should develop robust evidence-based policy solutions that target a community's food needs.

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Author's Statement Page

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## INTRODUCTION

### *Background*

A variety of factors, including the Covid-19 pandemic and wars on multiple continents, has heightened the issue of food insecurity. Furthermore, the US Major Cities Chiefs Association, an organization representing police departments in large cities, compared violent crime data from the first six months of 2021 and 2022 and found there was a significant increase in violent crimes in the first six months of 2022 (Gramlich, 2022). This heightens the need for evidence-based policy solutions in the post-pandemic era to combat increases in food insecurity across the United States. Food insecurity is defined as "either a permanent or temporary lack of consistent access to healthy food for every person in a family to eat, be active, and be healthy" (Feeding America, 2022). Violent crime is defined as "a crime where the victim is "…harmed by or threatened with violence…" which includes "…rape and sexual assault, robbery, assault, and murder" (NIJ; 2022). Both food insecurity and violent crime are in the forefront of contemporary U.S. political and public health discussions. For instance, the increase in families suffering from food insecurity in a supposedly highly developed country like the United States is startling and has started to command a higher level of attention among policymakers and public health officials (OASH, 2022). Indeed, by hosting the first White House conference since the Nixon administration on Hunger, Nutrition, and Health in America, President Biden has brought some new life to research on food insecurity in the US. White House believes the conference is a catalyst for new research and new programs to address the various aspects of food insecurity in the U.S., including how to eliminate it (Jean-Pierre, 2022; OASH, 2022). However, recent cuts to the Supplemental Nutrition Assistance Program (SNAP) benefits, a government food assistance program for low-income individuals which has been shown to reduce food insecurity, especially

among children, threaten the ability of the government to even provide food aid to hundreds of thousands of Americans who may now lose it (Hartline-Grafton et al., 2021; Konish, 2023). There are varying positions on the feasibility of providing food aid to millions of people, which is why research on this topic is relevant and could add to the broader and complex discussion on food insecurity in America.

The impacts of food insecurity and violent crime have been integral to the political and social discussion in Georgia and across the United States for years and will continue to be for the foreseeable future. In 2020, the Center for American Progress reported that close to 14 million households did not have enough food to sustain their families. In 2022, that number increased to almost 24 million households, with approximately 12 million households' containing children (CAP, 2022). This increase in households facing food insecurity must prompt an appropriate reaction from policymakers and public health officials including greater attention and action in addressing these complex issues. Otherwise, the economic, educational, and societal stability, as well as the mental, physical, and general overall health of a community can be extremely compromised (Chilton et al., 2016; Cox et al., 2016; Crowe et al., 2018; Chilton et al., 2016; DiFiore et al., 2022; Fang et al., 2021; Gundersen et al., 2015; Kim et al., 2023; Whitsett et al., 2018).

### *Study Purpose*

To address food insecurity in Georgia and communities across the United States, it is important to first study and understand the possible relationships between food insecurity and various societal and economic variables, such as violent crime. Hence, this research is designed to determine whether communities across the state of Georgia that have historically high

prevalence of food insecurity and those that are recently experiencing food insecurity also tend to experience higher levels of violent crime. The relationship between food insecurity and violet crime is unclear. There is a growing body of research on food insecurity and violet crime with researchers taking different approaches in understanding the link. For example, trauma surgeon, Dr. Randi Smith, and her Grady Hospital research team compared locations with high levels of gun violence in Atlanta to census data mapping out areas deemed food insecure. They discovered that the two maps looked very similar meaning the areas which were experiencing higher levels of gun violence based on where gunshot victims had come from to Grady Hospital were also the areas that have been food insecure (Smith et al.; 2020). A study out of Tulane University compared gunshot victims from a major trauma 1 center in New Orleans and their county of residence to county-level data on food insecurity and access. They found that the counties with the highest number of gunshot victims also experienced the most food insecurity (Ali et al.; 2022). Another study out of the University of California, Los Angeles looked at the association between food insecurity and intimate partner violence against women with a sample of women from across California. What the researchers who conducted this study identified was that the woman who reported being food insecure were more likely to have also experienced intimate partner violence (Ricks et al.; 2015). All of these studies add a different dynamic and understanding to the relationship between food insecurity and violent crime in various settings and provide a solid basis to further study this relationship. Therefore, the purpose of this research is to add to the growing body of literature already present and give a broader understanding of both food insecurity and violent crime and their possible relationship in Georgia to develop future economic and social policy solutions.

### *Study Aims*

The overall research aim is to expand upon the research previously done in Atlanta by Smith et al. 2020. In this study, the relationship between food insecurity and violent crime was examined through a statewide lens, breaking it down at the county level and comparing the violent crime incidence to levels of food insecurity in counties across the state of Georgia. This study will broaden the understanding of the impacts that food insecurity and violent crime have on communities around the state of Georgia. Thus, providing a roadmap for addressing food insecurity and crimes Georgia. As discussed above, Georgia has seen a significant rise in both food insecurity and violent crime (FRAC, 2021; GBI, 2020). The results of this study may provide useful economic, criminal justice, and public health principles to develop policies that can adequately address these major societal issues facing contemporary society.

This research study is designed to accomplish three specific aims:

**Aim 1:** To determine whether an association exists between the rate of food insecurity and the incidence of murder in Georgia counties while controlling for the county's median household income, unemployment level, and uninsured level. The findings from aim 1 will provide insight into whether Georgia counties with high rates of food insecurity also experience the highest incidence of murder.

**Aim 2:** To determine whether an association exists between the rate of food insecurity and the incidence of rape in Georgia counties while controlling for median household income, unemployment level, and uninsured level. The findings from aim 2 will provide insight into whether Georgia counties with high rates of food insecurity also experience high incidence of rape.

**Aim 3:** To determine whether an association exists between the rate of food insecurity and the incidence of robbery in Georgia counties while controlling for the county's median household income, unemployment level, and uninsured level. The findings from aim 3 will provide insight into whether Georgia counties with high rates of food insecurity also experience the highest incidence of robbery.

## LITERATURE REVIEW

### *Introduction*

The literature review presented below is divided into three sections to clarify the current literature available and the status of food insecurity and crimes in Georgia. The first section of this literature review will include an overview of the present state of food insecurity in Georgia. The second section contains an overview of the current state of violent Crime in Georgia. The third section includes an analysis of four critical pieces of literature which provided the foundation for this thesis. These pieces of literature attempt to establish a similar relationship between food insecurity and violence and, therefore are vital to understand and evaluate (Ali et al., 2022; Chilton et al., 2013; Ricks et al., 2015; Smith et al., 2021).

The available literature related to food insecurity and violent crimes is not substantial. Still, there is a growing movement towards research investigating the possible links between food insecurity and violent crime and its relationship to various socioeconomic factors. This research examining types of violence and food insecurity is critical in light of the Covid-19 Pandemic and the war in Ukraine placing extreme burdens on the global food system, creating mass food shortages and increased food prices across the developed and developing nations. However, while there exists a body of literature on the impact violent conflict or war has on food insecurity, mostly in developing or underdeveloped countries; there has not been enough of a focus on research to understand how food insecurity influences people towards violent crimes like murder, rape, and robbery in developed nations such as the United States.

### *The Present State of Food Insecurity*

Over the decades, Georgia has seen an overall rise in food insecurity (FRAC, 2021; GBI, 2020). According to the Food Research & Action Center, from 2018 to 2020, 10 percent of Georgia households reported being food insecure, and 3.8 percent of Georgia households with children reported being food insecure. This change accounts for a 1.3% and 1% increase from the last data collection between 2008 and 2010 (FRAC; 2021). There are a few well-established programs to address food insecurity in Georgia, such as the Supplemental Nutritional Assistance Program (SNAP). However, there are significant gaps in participation, with 14 percent of eligible individuals and 29 percent of eligible workers not being enrolled for SNAP benefits. These gaps are due to various factors, including a lack of awareness of food assistance programs, the administrative burdens of enrolling in food assistance programs, and the stigma surrounding government food assistance programs (Madhusudan, 2021). These gaps are worrying, considering the effectiveness SNAP has been found to possess in reducing food insecurity and improving health outcomes (Gundersen et al., 2015).

Furthermore, since the Recession in 2008, family poverty has increased, wages have not risen with the cost of living, and available cash and food assistance programs have declined across the United States (Popkin et al., 2016). Unfortunately, this further highlights the complexity and difficulty of developing a solution to address food insecurity. Especially among low-income communities in rural and urban areas across the United States, which will require the most attention and assistance to address food insecurity and stabilize these populations (Caughron, 2016).

The impact of food insecurity on children and mothers is severely detrimental (Chilton et al., 2017; Hatcher et al., 2022; Kim et al., 2023; Madjusudan, 2021; Popkin et al., 2016; Ricks et al., 2016; Whitsett et al., 2018). For example, an association between food insecurity and poorer

psychosocial health, observed-in Georgia colleges and universities during a longitudinal study of 18-to-25-year-olds (Madjusudan, 2021). Furthermore, the negative impact that food insecurity has on children's safety and the mother's safety in their households continues to prompt further research into the relationship. For example, a recent study conducted by researchers at the University of Illinois at Urbana-Champaign and Baylor University found that higher rates of food insecurity in households contributed to increased maltreatment of children in those households. However, the level of growth of child maltreatment varied between urban and rural counties (Kim et al., 2023). Food insecurity can also contribute to the development of severe negative behavioral issues among low-income children (Whitsett et al., 2018).

Women and mothers living in households with food insecurity also face similar challenges to children in same settings (Chilton et al., 2017; Hatcher et al., 2022; Kim et al., 2023; Madjusudan, 2021; Popkin et al., 2016; Ricks et al., 2016; Whitsett et al., 2018). The level of violence and decline in mental health that women in food-insecure households experience are on par with that of their children (Hernandez et al., 2014; Ricks et al., 2016). For example, an analysis of 6 years of data from the California Women's Health Survey found a strong association between food insecurity and intimate partner violence (IPV), and that association became even stronger when the severity of food insecurity was higher in a household (Ricks et al., 2016). This finding further highlights the danger food insecurity poses to the health and stability of households across the United States. As discussed above, women's mental health in food-insecure households is also in significant jeopardy if the proper assistance is not provided. An examination of data from a Fragile Families and Child Well-being study in which 1,690 socioeconomically disadvantaged mothers of young children participated found that mothers in households with the lowest socioeconomic status and who experienced IPV simultaneously had

the most significant decline in mental health and reported feelings of depression, anxiety, and fear (Hernandez et al., 2014). These symptoms, unfortunately, could be passed to the children who live in, witness, and experience the same instability that the mother is facing. Even more striking regarding the relationship between women's health and food insecurity are the findings from a qualitative study conducted among African American women in Philadelphia, which analyzed the connections between health and food insecurity. Women from that study described "a hunger of the body," referring to the pain of hunger and the violence experienced at home due to the instability of being food insecure, and "a hunger of the mind," referring to the trauma and decline of one's mental health that food insecurity causes (Chilton et al., 2007; Gundersen et al., 2015). These findings and the literature described above regarding the devastating economic, physical, and cognitive impacts of food insecurity on Americans of all races, ages, and genders reaffirm the danger that ignoring food insecurity in the United States carries for the health and well-being of future generations of Americans.

### *The Present State of Violent Crime*

Georgia has seen a precipitous increase in violent crime. In 2018, violent crimes accounted for 11.35 percent of the total crimes committed in Georgia. In 2020, that number had increased to 16.68 percent of the total crimes committed in Georgia (GBI; 2020). Specifically murders and burglaries, which have seen year-over-year increases in Atlanta and across Georgia, according to GBI data (GBI, 2020; F5 ADT, 2023). This trend is only further confirmed by a WalletHub study that found from the beginning of 2021 to the beginning of 2023, Atlanta saw the thirds largest increase in homicide rates (McCann; 2023). Furthermore, in a retrospective review conducted by Smith et al. of 1,700 patients records from Atlanta's Grady Hospital Level 1

Trauma Center who arrived due to a gunshot incidence (GSI) from 2012 to 2018 found that out of the 33 counties in which these patients resided, five counties accounted for 50% of GSI incidence reviewed. Smith et al. also discovered that of those five counties that accounted for 50% of GSI incidences, 3 had the highest rates of food security, and 2 had the highest rates of low access to food with no vehicle (LANV) (Smith et al., 2020). This identifiable relationship between GSI incidence and food insecure communities further highlights the possible effectiveness of implementing a multi-faceted approach using comprehensive social policies to address both food insecurity and violent Crime as Smith et al. (2020), Caughron (2016) and Dean (2022) have all pointed too in their research.

The impacts of violence such as murder, rape, and robbery, on communities, including a loss of income, food security, housing, education, and physical and mental health, necessitate action to address this extremely complex and devastating issue (Barczy; 2021). Specifically, government action to invest in locally owned stores and community markets, considering the unwritten policy of many major grocery stores and supermarkets that avoid opening stores in low-income communities, especially those that experience higher crime levels due to the apparent risk placed on their business in these locations. Unfortunately, this decision has increased the prevalence of food insecurity and crime in communities across the United States and complexified potential solutions for public health officials and community leaders (Crowe et al., 2018). For example, Caughron (2016) found that for every one percent increase in food insecurity that communities in the United States experience, the violent crime rate increases by twelve percent, accounting for various confounding variables.

Violent crime and food insecurity in a community can lead to children experiencing PTSD, depression, anxiety, low education attainment, poor health outcomes, and even becoming

involved in violent crime themselves to survive and become stable (Popkin et al., 2016; Kim et al., 2023). For example, a review of data from the Fragile Families and Child Well-being Study found that parental incarceration leads to a four percent increase in the likelihood of food insecurity in households with children living within them (Cox et al., 2016). Chilton et al. also discovered that many adult participants from a Childhood Stress Study, which examined the relationship between hunger and violence across generations, reported experiencing the same economic instability and violence from childhood to adulthood (Chilton et al., 2016). Even more so, Miller et al. recently found that food insecurity, held as an individual risk factor, appears to have some correlation with an increased rate of present and future exposure and involvement in violence (Miller et al., 2021). This further highlights the need for comprehensive legislation and policies to address these issues because they have persisted in communities across the United States for generations and will continue if action is not taken.

Research studying the possibility, as well as the effectiveness of addressing both food insecurity and violent crime through policies that intervene in a communities built social and economic environment, has shown the potential to be effective. However, further research is required to confirm the effectiveness of policies addressing food insecurity and violent crime through a public health lens for policymakers to consider implementation seriously (Ali et al., 2022; Chilton et al., 2007; Crowe et al., 2018; DiFiore et al., 2022).

### *Summary Analysis of Key Supporting Literature*

While this research focuses on looking at the county level for the State of Georgia, much of the literature comes from studies looking at the issue through the lens of a city, such as Atlanta or Philadelphia, or a zip code or gender. This focus provides a unique opportunity to add

to the literature on this subject, but through a varied lens by looking at counties and various types of violent crime.

For example, in New Orleans, Ali et al. 2022, did look at food insecurity and violent crime data through a county-level lens. However, these researchers out of Tulane University School of Public Health and School of Medicine focused explicitly on "firearm injury data" collected through a Level 1 trauma center in the city. Ali et al. 2022 did link this firearm data to a publicly available data set of food insecurity at the county level based on state trends. The results of the Ali et al. 2022 study were illumining. Their research showed a significant association between food insecurity and firearm injuries/violence within counties in South Louisiana, providing this research with a solid basis for comparing the county-level rates of food insecurity to violent crime data. However, there are some limitations to the Ali et al. 2022 study that this research hopes to account for. For example, Ali et al. focused specifically on southeastern Louisiana, limiting their findings' generalizability to other areas of Louisiana and other states. This study was also unable to account for the possibility of gun violence victims not residing in those zip codes where the violence took place, so linking the incident of gun violence to rates of food insecurity in that zip code becomes very difficult to prove.

However, the study done by Smith et al. 2020, which attempted to determine an association between food insecurity and "gunshot injury (GSI) incidence," addressed some of the limitations of the Ali et al. 2022 study in a few manners that added validity to the study's findings and provided this research with a solid foundation to model itself after. For example, as Ali et al. 2022 did in southeastern Louisiana, the Smith et al. 2020 study attempted to establish an association between food insecurity and GSI incidence in Atlanta. The researchers looked at the Grady Hospital Level 1 trauma center registry on gunshot victims, where they took

socioeconomic and demographic data to compare that information to the U.S. Department of Agriculture's Food Access Research Atlas data on those areas where the gunshot victim resided. This difference in method and ability to account for residence adds much more validity to the Smith et al. 2020 study. It allows the researchers to connect the GSI incidence to the food insecurity rates of the zip code the victims reside in. This method permitted Smith et al. 2020 to show a much stronger association between food in security and violence where victims specifically live, in this case, in an urban setting such as Atlanta. This strength is unlike the Ali et al. 2022 study, where the researchers could only account for which county the incidence happened and not if the victim resided in the county.

Chilton et al. 2013 and Ricks et al. 2015 have taken this topic somewhat differently than Ali et al. 2022 and Smith et al. 2020 did by looking at the association between food insecurity and intimate partner violence. This association shows food insecurity's strain on families nationwide and its negative impacts on American homes. For example, Chilton et al. 2013 focused on 44 women with children in public assistance programs in Philadelphia. They found that "ten of the seventeen (59%) participants who reported very low food security also experienced a life-changing violent event, such as abuse, rape, or neglect." Ricks et al. (2015) focused on women in California using data from the California Women's Health Survey over six years and found that food insecurity and intimate partner violence against women has a strong positive association. When broken down by race, this strong positive association also showed a disparity among African American women who experienced food insecurity and intimate partner violence at a much higher prevalence than their white counterparts. This finding further highlights the importance of researching and understanding these topics, with reports suggesting

that both rates of food insecurity and incidences of intimate partner violence have increased during the Covid-19 pandemic (Leddy; 2020).

This literature points to a strong association between food insecurity and violent crime. The reviewed studies can provide a solid basis for this research on counties in Georgia. This research can also assist further development of studies looking at the relationship between food insecurity and violent crime by providing a theoretical concept that can be used in various other contexts.

## THEORETICAL CONCEPT

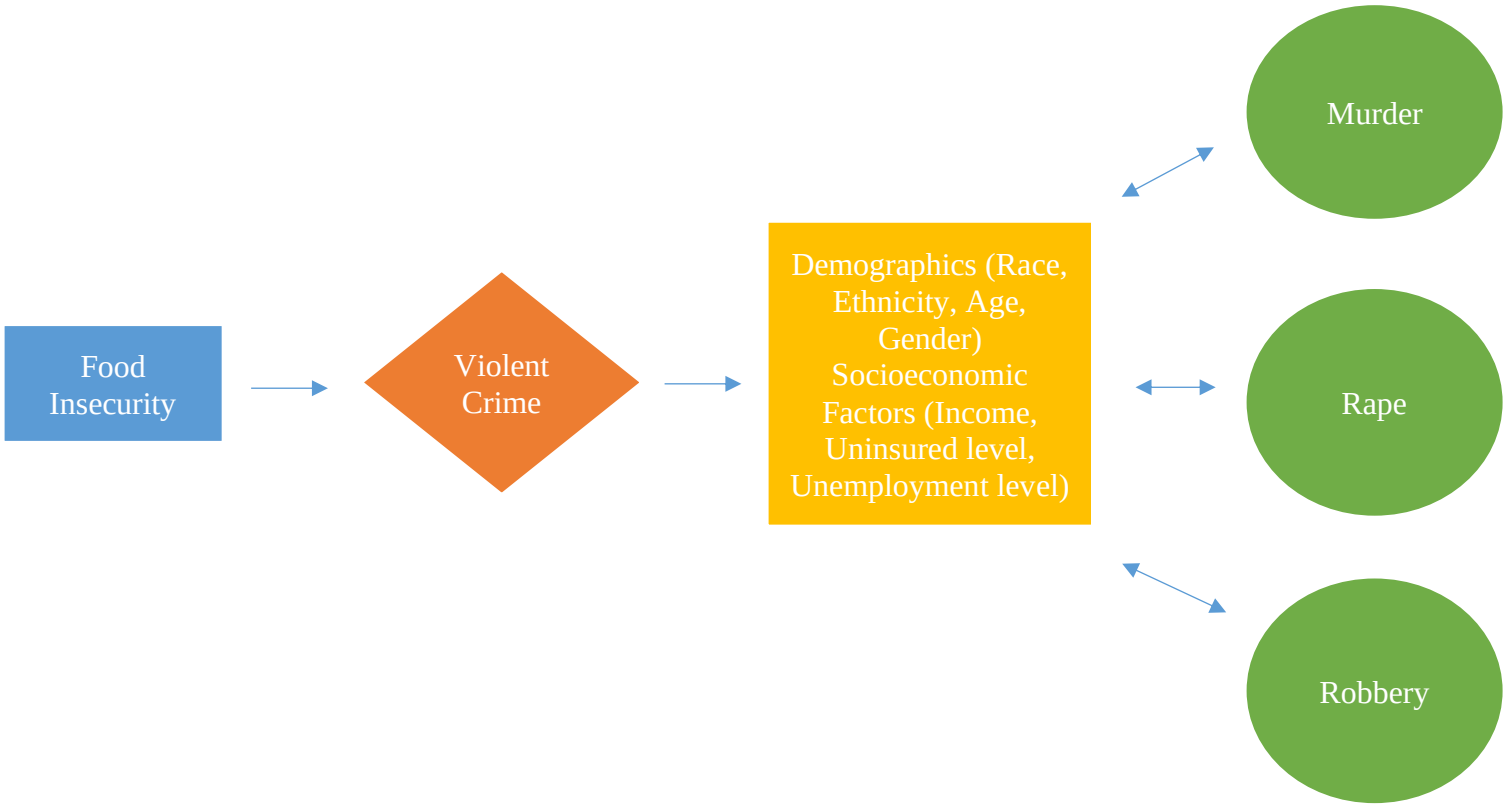
This study was guided by the Strain Theory which states that "certain strains or stressors increase the likelihood a person or group will commit a crime" (Nickerson and Mcleod, 2023). Robert K. Merton, a former President of the American Sociological Association, developed the theory and believed that society strains and pressures individuals to achieve goals they do not have the resources to achieve and therefore attempt to achieve them by other means (ASA, 2003; Mcleod & Nickerson, 2023). The key strain that was examined in this study develops when a person cannot provide for themselves or their family or achieve the goals they set forth for themselves in life (Criminal Justice, 2022). This strain can lead people to commit an act they might not otherwise commit. Those acts include violent crime because the individual believes at that moment that there is no other option moving forward for them to achieve their goal than through illegal means. The strain theory might assist in explaining why regions across the United States experiencing food insecurity are also experiencing higher levels of violent crime.

Below in Figure 1. is the theoretical model that was developed, through a review of the relevant literature described above, for this cross-sectional study of food insecurity and its influence on rates of different types of violent crime across Georgia counties. The variables and the definitions that were utilized for this study are shown below. The variables included food insecurity, murder, rape, robbery, household median income, the unemployment level, and the uninsured level. The variables listed above were defined as follows. *Food Insecurity* was described as a permanent or temporary lack of consistent access to healthy food for every family member to eat, be active, and be healthy (Feeding America, 2022). *Violent crime* was defined as a crime where the victim is "…harmed by or threatened with violence…" which includes "…rape and sexual assault, robbery, assault, and murder" (NIJ, 2022). *Murder* is defined as "the unlawful

killing of a human being with malice" (DOJ, 2022). *Rape* was defined as the penetration, no matter how slight, of the vagina or anus with anybody part or object or oral penetration by a sex organ of another person, without the victim's consent (DOJ, 2012).

Robbery was defined as "taking or attempting to take anything of value from the care, custody, or control of a person or persons by force or threat of force or violence" (FBI, 2010). The unemployment level was defined as the percentage of the population ages 16 and older that are unemployed but seeking work (U.W., 2023). The uninsured level was expressed as the percentage of the population under 65 without health insurance (U.W., 2023). The Median household income was defined as the yearly income where half of households in a county earn more and half of households in the county earn less (U.W., 2023).

**Figure 1.**



## METHODS

### *Overview*

The data utilized for this study came from the Georgia Bureau of Investigation Uniform Crime Reporting (UCR) Program from 2020, Feeding America Map the Meal Gap Database for 2020, the United States Census Bureau Population Health Survey, and the University of Wisconsin School of Medicine and Public Health's Population Health Institute from 2020.

### *Data Collection*

The data on Georgia counties' violent crime rates were retrieved from Georgia's Uniform Crime Reporting (UCR) Program, housed within the Georgia Crime Information Center. This program comes from the Federal Bureau of Investigation's national program on crime reporting. The Georgia Uniform Crime Reporting Program has nationally established definitions and procedures to analyze the data from offense and arrest reports submitted by law enforcement agencies across Georgia. The data, however, did not include estimates for the possibility of incidents or arrests that occurred or could have occurred but were not reported by Georgia Law Enforcement agencies. The GBI UCR Summary Reports utilized in this research from the Georgia Uniform Crime Reporting (UCR) program represented data from 2020, including a wide range of crime data from the State of Georgia. The types of crimes that this report provided data on from counties around Georgia include Murder and Non-Negligent Manslaughter, Rape, Robbery, Aggravated Assault, Burglary, Larceny-Theft, Motor-Vehicle Theft, Arson, and Human Trafficking (GBI; 2020). The types of crimes specifically looked at included murder, rape, and robbery.

The data on food insecurity present in counties around the State of Georgia was retrieved from the Feeding America Map the Meal Gap database for 2020. Feeding America maintains a detailed record of yearly food insecurity data and population health outcomes by analyzing data from the Current Population Survey (CPS), the United States Census Bureau America Community Survey, and the Bureau of Labor Statistics (BLS). One limitation of this data is that the Census Bureau did not release American Community Survey 1-year data, which Feeding America has historically used. This removal was done due to quality concerns related to COVID-19; therefore, 2020 data released by Feeding America was generated from a model analyzing CPS state data from 2009 – 2020 (Feeding America, 2023). Notably, the data accounted for many social, economic, physical, and mental factors that influence a population's health and well-being, including food insecurity (Feeding America; 2023). In addition, socioeconomic status, race, and ethnicity are accounted for in the Map the Meal Gap data. These were confounding variables in this research and, when accounted for, provide a greater understanding of the relationship between food insecurity and violent crime in the State of Georgia. The county-level data analysis provided by Feeding America's Map the Meal Gap database includes the total food-insecure population and the percentage of the population experiencing food insecurity in the county. These records and analyses generated by the Feeding America Map the Meal Gap Database have given public health professionals and policymakers a greater understanding of food insecurity and other public health measures and issues nationwide (Feeding America; 2023). The primary data point for this research was the county's total food-insecure population.

The University of Wisconsin's Population Health Institute's County Health Rankings for 2020 were utilized to collect data on the covariates for this research. The University of

Wisconsin School of Medicine and Public Health's Population Health Institute, maintains a detailed record of yearly population health outcomes using the County Health Rankings Model to collect data on and rank counties across the United States on their performance in various areas of population health. These variables included the uninsured population, unemployment population, and median household income per county.

The demographic data for each county was retrieved from the United States Census Bureau's American Community Survey (ACS) 5-Year estimates data profiles for 2020. Specific data for the 2020 American Community Survey was not released due to COVID-19. This study included data on population numbers, age, gender, and race/ethnicity.

### *Key Variables*

The key variables of this research study were established, defined, and structured in a theoretical model in the Theoretical Concept section above. The analysis methods utilized included a descriptive analysis of the demographic data, a correlation analysis of food insecurity and violent crime adjusted for the median household income, the unemployment level, and the uninsured level in Georgia counties, and a regression analysis of food insecurity and violent crime, controlling for the median household income, the unemployment level, and the uninsured level in Georgia counties.

### *Confounding Variables*

The confounding variables relevant to this study were identified through an extensive review of previous literature on the various relationships and influence food insecurity and violence have on one another. The confounding variables utilized were socioeconomic factors,

including the median household income, the unemployment level, and the uninsured level. The socioeconomic data for the counties included in this study was collected from the University of Wisconsin School of Medicine and Public Health's Population Health Institute's County Health Rankings from 2020.

### *Data Analysis*

The statistical analysis was conducted using the SPSS software and included three separate analyses. Basic descriptive statistics (mean and standard deviation) were used to describe the demographic variables in this study. The dataset included data on population, race/ethnicity, gender, and age, which provided greater context and a broader understanding of the population dynamics that possibly influence food insecurity and violent Crime across Georgia counties. A correlation analysis was conducted to determine the degrees of linear relationship between food insecurity and violent crime, specifically murder, rape, and robbery, adjusting for median household income, the uninsured level, and the unemployment level. A p-value less than 0.5 was considered statistically significant. Finally, a multivariate regression analysis was used to predict the associations of food insecurity with murder, rape, and robbery incidences in Georgia counties, controlling for the confounding variables. The standard measures of significance for regression analysis were utilized, and the $r^2$ values were used to determine the percentage of the dependent variable that are explained by the models.

## RESULTS

### *Basic Characteristics of Studying Georgia State Counties*

Table 1 shows the basic demographic statistics that were utilized in this research to study the association between food insecurity and violent Crime in Georgia counties.

The total population by county of Georgia in 2020 was 10,711,905, with a mean population for Georgia counties of 67,370. The total number of the food insecure population by county is 1,186,850, with a mean food insecure population per county of 7,464. These figures place Georgia's food insecurity rate at 11.1%, close to the national food insecurity rate average for 2020 of 11.8% (Feeding America, 2023). The total number of murder incidences across all Georgia counties was 618, the total number of rape incidences was 2,610, and the total number of robbery incidences was 4,108. This placed Georgia in the top 10 states with the highest homicide rate in 2020 (CDC, 2023). The median household income in Georgia in 2020 was $62,482.29. This is significantly below the national average calculated by the St. Louis Federal Reserve of $71,186.00 (FRED, 2023). The male population was 5,188,570, and the female population was 5,523,338, highlighting a more significant female population in Georgia in 2020. The racial/ethnic makeup of the state of Georgia in 2020 was a 5,555,480 White population, a 3,320,510 Black or African American population, a 479,028 Asian population, a 50,618 AIAN population, a 7,299 Native Hawaiian and other Pacific Islander, and a 555,057 population who identified as some other race.

**Table 1: The Basic Characteristics of Study Georgia State Counties**

| Variables | Number | Mean | SD |
|---|---|---|---|
| Total Population | 10711905 | 67370.47 | 146519.68 |
| Food Insecurity | 1186850 | 7464.47 | 14546.51 |
| Murder Incidence | 618 | 3.89 | 15.07 |
| Rape Incidence | 2610 | 16.42 | 35.31 |
| Robbery Incidence | 4108 | 25.84 | 103.87 |
| Median Household Income | 8344684 | 62482.29 | 14394.71 |
| Uninsured Level | 1343754 | 8451.28 | 17093.736 |
| Unemployment Level | 330968 | 2081.56 | 5457.68 |
| Male Population | 5188570 | 32632.52 | 70552.19 |
| Female Population | 5523338 | 34737.97 | 75980.74 |
| White | 5555480 | 34940.13 | 60327.77 |
| Black or African American | 3320510 | 20883.71 | 57920.20 |
| Asian | 479028 | 3012.75 | 13402.09 |
| American Indian and Alaska Native (AIAN) | 50618 | 318.15 | 864.36 |
| Native Hawaiian and Other Pacific Islander | 7299 | 45.91 | 104.75 |
| Some Other Race | 555057 | 3490.92 | 11534.02 |

**Pearson Correlation Analysis between Food Insecurity and Murder, Rape, and Robbery**

The results of the correlation analyses between food insecurity and violent crime variables are shown in table 2.

The strength of degree of linear relationship between food insecurity and violent crime was shown to be positive and statistically significant for all crime categories, including murder, rape, and robbery. The degree of linear relationship represented by the p-value between food insecurity and murder, robbery, and rape was deemed highly significant at <.001, below the established significance level of 0.05. The Pearson correlation r values, using the standard measure for strength of linear relationship with -1 being a strong, negative linear relationship to +1 representing a strong, positive linear relationship, showed a strong degree of linear

relationship between food insecurity and murder, rape, and robbery. The r values representing the strength of linear relationship between food insecurity and murder, rape, and robbery were .834, .786, and .802, respectively, which show a robust linear relationship between variables. The strength of the linear relationship was also associated with the relationship between the various types of crime. For instance, murder incidence, when compared to rape and robbery, showed a strong linear relationship with each other, represented by r values of .816 and .962, respectively. This strong degree of linear relationship between these variables remained the same when comparing robbery to rape and murder and when comparing rape to murder and robbery.

**Table 2: Correlation Between Insecurity and Murder, Rape, and Robbery**

| | | Food Insecurity | Murder | Robbery | Rape |
|---|---|---|---|---|---|
| Food Insecurity | Pearson Correlation | 1 | .834** | .802** | .786** |
| | Sig. (2-tailed) | | <.001 | <.001 | <.001 |
| | N | 159 | 159 | 159 | 159 |
| Murder | Pearson Correlation | .834** | 1 | .962** | .816** |
| | Sig. (2-tailed) | <.001 | | <.001 | <.001 |
| | N | 159 | 159 | 159 | 159 |
| Robbery | Pearson Correlation | .802** | .962** | 1 | .887** |
| | Sig. (2-tailed) | <.001 | <.001 | | <.001 |
| | N | 159 | 159 | 159 | 159 |
| Rape | Pearson Correlation | .786** | .816** | .887** | 1 |
| | Sig. (2-tailed) | <.001 | <.001 | <.001 | |
| | N | 159 | 159 | 159 | 159 |

**. Correlation is significant at the P < 0.01 level (2-tailed).
Adjusted for median household income, lack of insurance, and unemployment

### Multivariate Regression Analysis of the Relationship of Food Insecurity and Murder, Rape, and Robbery

The results of the multivariable regression analyses of the association between the dependent variable (murder, rape, and robbery) and food insecurity are provided in Table 3.

The values in the table below are standardized regression coefficients and were utilized to determine the degrees of linear association. As show in the table, food insecurity was highly predictive of murder, rape, and robbery incidences. For each one-unit increase in murder incidences, .680 of that increase could be explained by an increase in the food insecure population in Georgia counties when accounting for median household income, the uninsured level, and the unemployment level. For each one-unit increase in rape incidences, .561 of that increase could be explained by an increase in the food insecure population in Georgia counties when accounting for median household income, the uninsured level, and the unemployment level. For each one-unit increase in robbery incidences, .338 of that increase could be explained by an increase in the food insecure population in Georgia counties when accounting for median household income, the uninsured level, and the unemployment level.

When looking at the adjusted $R^2$ values shown in the table, it is clear the independent variables utilized in this study predict a significant amount of variation of violent crime incidences. For instance, the data shows that 83.9% of the variation in murder incidences, 56.1% of the variation in rape incidences, and 33.8% of the variation in robbery incidences can be explained by the independent variables established in the linear models. It is further evidence of a strong linear and predictive relationship between food insecurity and murder, rape, and robbery.

**Table 3: Multiple Regression Analysis of the Relationship of Food Insecurity with Murder, Rape, and Robbery**

| | Murder | Rape | Robbery |
|---|---|---|---|
| Food Insecurity | .680** | .561** | .338** |
| Median Household Income | .001 | .079 | -.027 |
| Uninsured Level | -1.304 | -.061 | -.792 |
| Unemployment Level | 1.414 | .261 | 1.24 |
| Adjusted $R^2$ | .839 | .614 | .704 |

**P<.01

## DISCUSSION

### *Discussion of Research Questions*

The linear relationship between food insecurity and increases in violent crime is significant to understand in a public health context. It is even more imperative now with the high levels of food insecurity and violent crime communities face across Georgia and the United States (CAP, 2022; Feeding America, 2023; GBI, 2020). The results presented above showed that the total food-insecure population and the incidence of murder, rape, and robbery when controlled for median household income, the total uninsured population, and the total unemployed population had a strong degree of linear relationship. The results of this analysis also show that food insecurity, median household income, the total uninsured population, and the total unemployed population are significant predictor variables and can help explain increases in the incidences of violent crime at the county level in Georgia. In contrast, these results do not establish a relationship between the key variables at an individual or demographic level, such as race/ethnicity, gender, or age, which is helpful for a more detailed understanding of the relationship between variables. These county-level findings offer a unique perspective and starting point for developing and implementing policy solutions that impact the social and economic environment and structural issues in communities across Georgia.

Compared to the present literature on the association between food insecurity and violent crime, specifically murder, rape, and robbery, the results of this analysis are similar to what has been established in previous studies. For example, Ali et al. (2022) and Smith et al. (2020) discovered similar relationships between food insecurity and violent crime. Their results identified food insecurity as a significant predictor of gunshot injury incidence (GSI) and firearm injuries when comparing patient data on GSI and zip codes and Map the Meal Gap data and

USDA data on food insecurity. Caughron (2016) also found that for every one percent increase in food insecurity that communities in the United States experience, the violent crime rate increases by twelve percent, accounting for various confounding variables. Furthermore, Chilton et al. (2014) discovered from an ongoing mixed-method participatory action study with 44 mothers of children under three years that participants experiencing very low food insecurity reported exposure to child abuse, neglect, and rape. These results related to food insecurity, gunshot incidence, violence, and rape are consistent with the results of this study regarding the association between food insecurity and murder and rape. The limitations of these studies are also quite similar to this research. These studies also struggled in some cases with retrieving relevant data on food insecure individuals, such as Smith et al. (2020), who reported some victims of GSI not living in the zip code where the incidence occurred. These studies also noted a lack of robust data to examine the relationship between food insecurity and violent crimes over an extended period, which is also a limitation of this study. Future research should establish more robust datasets to continue studying the relationship between food insecurity and violent crimes.

One unique and unexpected variable not present in the current literature that this analysis accounts for is the degree of relationship between food insecurity and robbery. This absence was surprising as it is significant to understand because, according to the social risk theory, if an individual does not have the means to become food secure, they will achieve it through other means, and one of those would be robbery. There was a strong, positive degree of linear relationship between food insecurity and robbery identified in this analysis, suggesting that counties with a higher food-insecure population have higher incidences of robbery. While this conclusion cannot be definitively drawn from this research, the strong linear relationship

between a highly food-insecure population and increased incidences of robbery highlights the possibility that food-insecure individuals attempt to improve their social and economic standing and achieve food security through the criminal act of robbery. Future research should study this relationship further by examining specific individual arrest data related to robberies to establish if the individuals committing those robberies are food insecure or live in food insecure areas.

The overall impact of this analysis of food insecurity and violent crime cannot be understated from a public health perspective. While the present data and relationship determined is not enough to conclude that food-insecure individuals commit these violent crimes, there is an apparent statistically significant relationship identified between the number of food-insecure individuals in a Georgia county and the incidence of murder, rape, and robbery in that county when controlling for median household income, the total uninsured population, and the total unemployed population. These findings should provide policymakers with a roadmap for addressing the food needs and important structural issues communities across Georgia face through comprehensive, evidence-based social and economic policies that offer a better overall standard of living. Future research should determine whether food-insecure individuals and households are the perpetrators of criminal acts. This can provide a more nuanced understanding of how food insecurity can influence an individual to commit violent crimes and what interventions are required to address this possible association.

### *Study Strengths and Limitations*

The main strengths of this study relate to the data utilized and the nuanced analysis conducted. The data used in this research, while pulled from various sources, was a robust dataset that provided the ability to analyze and interpret associations between food insecurity and

violent Crime in Georgia counties. The dataset accounted for various socioeconomic factors and their impact on violent crime, further strengthening the association between variables at the county level. The types of analyses conducted and the variables utilized also represent a strength of this statistical analysis. Only a handful of studies identified during the literature review analyzed multiple types of crimes and numerous socioeconomic factors. This research, therefore, adds to the existing literature offering a new perspective on understanding food insecurity and violent crime.

This research study has several limitations that must be considered when interpreting the results. One, several other important variables that are associating with dependent variables were included in this study. Second, the use of data originating from different sources with different methods for collecting the data and information may have impacts the reliability of the results from this research (Feeding America, 2023; Census Bureau, 2023; U.W., 2023; GBI, 2020). It may also hinder the ability to draw broader conclusions about the associations being studied. This limitation can partially be accounted for through variable controls and regression analysis to test these variables' impact on one another. Future research should establish uniform databases for studying the implications societal, cultural, and economic variables have on violent crime and food insecurity. This database will allow future researchers access to food insecurity and crime-related data that provides a clearer picture of the association between the two variables. Third, as an ecological study, one cannot rule out ecological fallacy. While an ecological study is not harmful, it does not provide results for individuals and separate populations, which decreases the generalizability of the results. Future research should look to the individual and population level of analysis to create a more complete picture of the association between the variables. The final limitation of this study may be related to the use of a single year of data. While single-year data

can still provide important insights into the relationship between food insecurity and violent crime, future research should expand the review period by increasing the data collection years. This will allow researchers to identify further and understand the nuances and complexities of the relationship between food insecurity and violent crime in communities across the United States.

## POLICY RECOMMENDATIONS

The various impacts that food insecurity and violent crime have on Georgians, identified through a review of the current literature and analysis of recent food insecurity and violent crime data, suggest a strong, positive linear relationship between the two variables is present. Therefore, policymakers and researchers should begin to develop policies, programs, and funding initiatives that can address both issues simultaneously, specifically policies and programs that aim to alter the present economic and social environment of the population. This research did not specifically account for the variables related to the programs and policies described below, which hinders the ability to make direct claims on the effectiveness of these programs and policies on food insecurity and violent crime. However, these policy recommendations do offer a reasonable frame of reference for understanding these issues and can be utilized to start a substantive discussion on how to address food insecurity and violent crime through a public health lens.

### *Community Farms and Gardens*

Many states have developed food assistance policies and programs to address food insecurity in metropolitan areas and have seen positive health, economic, and social benefits. For instance, in Boston, Massachusetts, a coalition made up of the city planning office, the mayor's office, and a group of community stakeholders and experts passed a zoning ordinance that allowed the city to create six community farms in low-income communities around Boston that cover in total three acres of land (Blackwell, 2016). This initiative has increased the community's access to healthy, affordable foods and provided opportunities to participate in community-building initiatives trying to improve the social environment. This approach to addressing food

insecurity through a community farm approach is also unique in that a land use and zoning ordinance was given instead of a permit, allowing the community to have a more significant say over how the land is used. While Georgia has various strictest zoning laws, this approach in and around Atlanta, if reproduced in the proper context, could prove to be very effective as both Boston and Atlanta are large metropolitan cities with low-income communities in need of food assistance (Blackwell, 2016; Land.com, 2023; Madhusudan, 2021). Furthermore, a quick search of LandWatch.com for undeveloped land in Metro Atlanta yielded 945 results, which could be used for community-based food assistance programs, such as the community farms in Boston.

### *Supplemental Nutrition Assistance Program (SNAP) Reform*

Another approach to addressing food insecurity by positively altering the economic and social environment is reforming and improving the programs and benefits already active in communities, such as SNAP. The Supplemental Nutrition Assistance Program has provided Americans in all 50 states with food assistance for decades (Madhusudan, 2021). However, during the pandemic, the shortcomings of SNAP programs around the country became very apparent. In 2022 almost 24 million households were deemed food insecure, with 11.6 million of those households containing children, a 10% increase in food insecure households from 2020 (CAP; 2022). Given the effectiveness federal and state nutrition assistance programs have shown in the past, Georgia must look to reform and improve these programs to meet the needs of today's community and address food insecurity (Hartline-Grafton et al., 2021). In Georgia, two main barriers to increasing SNAP participation for those eligible but not registered are the stigma surrounding food assistance programs and the administrative burden to enroll and renew in SNAP. For instance, many Georgians who are eligible but not enrolled in SNAP are unaware

they are even eligible. When these individuals are made aware, the stringent application and periodic renewal process turn many away from the program (Madhusudan, 2021). Therefore, policymakers and public health officials in Georgia should begin to look for ways to revamp the image of SNAP participation. For example, increasing the number of stores and markets SNAP participants can shop at to integrate the program into the community further and streamline the process for registration and renewal by allowing those processes to be completed through a doctor's appointment where the administrative burden could be shared between the individual, their doctor, and Government stakeholders (Tomer et al, 2021; Gundersen et al., 20115; Madhusudan, 2021). These strategies could alleviate the stigma and burden of SNAP participation, often placed solely on the participant and their families.

While the feasibility of this recommendation is not promising after the recent SNAP cuts that have taken place, it is essential to highlight still the significant gap in food and economic assistance still needed even after SNAP participation (Tomer et al., 2021; Konish, 2023). For example, SNAP benefits at the moment take into account your income and household size in deciding the level of benefits you can receive. Important factors, such as the rising cost of living and food prices in a community, are not considered. If your income is stagnant, but the cost of living increases, your SNAP benefits will remain the same, forcing individuals and families to make tough decisions between food, gas, bills, and healthcare (Tomer et al., 2021; Hartline-Grafton et al., 2021). Therefore, policymakers and public health officials in Georgia should look for ways to allocate funds for SNAP to utilize during inflationary periods and cost of living increases, as well as adjust benefits to meet the cost of living in that community now so that during periods of inflation, low-income Georgians do not have to make decisions between buying medicine and feeding themselves and their families.

### *Community Investment*

Another approach to changing the economic and social environment of a low-income community to address food insecurity and violent crime is through investment in the community itself. When the private and public sectors work to create jobs and bring resources and businesses into the community, such as affordable grocery stores and end the corporate redlining that so often occurs in minority, urban, and rural low-income areas, communities have a chance to thrive (Love, 2021; Pathak et al., 2021; Rowlands et al., 2023). For instance, a recent population-based case-control study conducted from 2008 to 2014 in a Philadelphia neighborhood found that introducing street lighting, painted sidewalks, public transportation, and parks was associated with approximately 76% decreased odds of homicide (Culyba et al., 2016). Another study analyzing the effectiveness of youth workforce and employment development programs in low-income communities found that these programs reduced youth violence involvement by 35% to 45% (Heller et al., 2017). Even further, a recent Brookings Institute research paper that analyzed the 2020 Census Bureau's Household Pulse survey found that the first round of child tax credit payments sent out to American families was predominantly spent on food, almost immediately reducing very low food insufficiency among respondents by 3% (Tomer et al., 2021; Pathak et al., 2022). The examples presented above highlight how successful community investments have been in revitalizing a low-income community and its population, addressing societal issues such as violent crime and food insecurity, and creating a more stable environment for living. As discussions around strategies and solutions to address major societal issues, such as food insecurity, continue, policymakers, business and community leaders, and other community stakeholders should look to avenues for community investment. Specifically, avenues that

positively impact the communities social and economic environment and give the population a chance for stability and growth.

### *Future of Economic and Social Policies and Programs*

These policy and program recommendations show the potential to positively impact Georgia communities' economic and social environment by providing a more stable, affordable, and higher quality of living for low-income communities. It should prompt policymakers and public health officials in Georgia to act and address food insecurity in a relevant and nuanced manner. Specifically, by incorporating a "Public Health in All Policies" approach that addresses the current social and economic woes of communities across the state before the damage to those communities becomes too great to overcome. Those policies and strategies can then be a guideline for solving public health and societal issues in various contexts as they develop.

## CONCLUSION

The strong, positive linear association between food insecurity and violent crime, specifically murder, rape, and robbery, when controlling for median household income, the total uninsured population, and the total unemployed population, highlights the interconnectedness of socioeconomic factors in Georgia. While this study excluded various other socioeconomic factors, it is evident that the total food insecure population, unemployed population, and uninsured population may help explain increases in the incidence of violent crimes in Georgia counties. Policymakers and public health officials should examine this study and other similar studies to identify social and economic policies and programs that could positively alter a community's socioeconomic environment to address violent crime, food insecurity, and various crucial public health issues. Future studies should analyze a more extensive set of socioeconomic variables over an extended period to establish a more concrete association between food insecurity and violent crime.

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