

THE PENNSYLVANIA STATE UNIVERSITY
SCHREYER HONORS COLLEGE

DEPARTMENT OF POLITICAL SCIENCE

ANALYSIS OF FOOD BANKS ACROSS TEXAS COUNTIES
AND COMMUNITY FOOD SECURITY

NORMA GARCIA
SPRING 2021

A thesis
submitted in partial fulfillment
of the requirements
for baccalaureate degrees
in Political Science and Global and International Studies
with honors in Political Science

Reviewed and approved* by the following:

Brian King
Professor of Geography
Thesis Supervisor

Michael Berkman
Professor of Political Science
Honors Adviser

* Electronic approvals are on file.

ABSTRACT

The issue of food security is one that has been longstanding in society and is well recognized across many disciplines. Previous research has articulated structural causes of food insecurity related to climate change, as well as its implications as both a social and health problem. As food insecurity continues to be a prominent feature of communities across the United States, it is critical that research continues to advance proposals and solutions that reduce levels of hunger, promote greater access to nutritious foods, and alleviate issues of affordability.

Food banks, as a historic feature of food activism and relief, provide an important context by which researchers can gain more knowledge about practices and challenges in improving community food security. Food banks are not only a source of aid, but rather a system in which community food security is being shaped. This paper critically analyzes the function of food banks related to community food security across various Texas counties. In examining available and current programming, food banks are categorized as distributive or participatory. The research seeks to advance knowledge about how both distributive and participatory models affect outcomes for food security to further inform researchers, policymakers, and activists.

TABLE OF CONTENTS

LIST OF FIGURES	iii
LIST OF TABLES	iv
ACKNOWLEDGEMENTS	v
Chapter 1 Introduction	1
Chapter 2 Literature Review	4
Food Security: Structural Causes and Implications	4
Community Food Security	7
Food Banks	12
Food Banks and Food Security in Texas.....	14
Chapter 3 Theory	18
Models Matter	19
Location and Proximity.....	21
Service Area.....	22
Chapter 4 Data and Methods.....	24
Limitations	27
Chapter 5 Results	29
Key Findings	38
Implications.....	43
Chapter 6 Conclusion.....	44
Appendix A Technical Appendix	47
Program Categorization Utilizing Keyword Search.....	49
Food Security Trend Analysis Per County.....	56
Correlational Analysis.....	66
Tables	75

LIST OF FIGURES

Figure 1: Map of Food Banks and Counties Served (Feeding Texas)	16
Figure 2: Bazerghi et. al's Conceptual Framework for Nutritional Quality Within Food Banking System.....	17
Figure 3: County Demographic Profile by Racial Breakdown	29
Figure 4: County Demographic Profile by Income.....	30
Figure 5: County-level Dataset Regarding Food Bank Modeling and Service Area	31
Figure 6: Program Modeling by County	32
Figure 7: Food Security Trend Across Counties.....	33
Figure 8: Cost per Meal Trend Across Counties.....	34
Figure 9: Annual Budget Shortfall Trend Across Counties	35
Figure 10: Service Area by County.....	37
Figure 11: Aggregated Correlation Between Rates of Food Insecurity and Participatory Programming.....	39
Figure 12: Opposing Trend in 2011 and 2012 for Aggregated Correlation Between Rates of Food Security and Participatory Programming	40
Figure 13: Aggregated Correlation Between Rates of Food Insecurity and Service Area.....	41
Figure 14: Opposing Trend in 2011 and 2012 for Aggregated Correlation Between Rates of Food Insecurity and Service Area	42
Figure 15: Food Security and Population Trend: Hardin County	56
Figure 16: Food Security and Population Trend: Henderson County	57
Figure 17: Food Security and Population Trend: Hopkins County.....	58
Figure 18: Food Security and Population Trend: Kerr County.....	59
Figure 19: Food Security and Population Trend: Navarro County	60
Figure 20: Food Security and Population Trend: Starr County	61
Figure 21: Food Security and Population Trend: Taylor County	62
Figure 22: Food Security and Population Trend: Upshur County	63
Figure 23: Food Security and Population Trend: Victoria County	64

Figure 24: Food Security and Population Trend: Walker County	65
Figure 25: Aggregated Correlation Between Rates of Food Insecurity and Participatory Programming.....	66
Figure 26: Aggregated Correlation Between Cost per Meal and Participatory Programming	67
Figure 27: Aggregated Correlation Between Annual Budget Shortfall and Participatory Programming.....	68
Figure 28: Aggregated Correlation Between Rates of Food Insecurity and Service Area.....	69
Figure 29: Aggregated Correlation Between Cost per Meal and Service Area	70
Figure 30: Aggregated Correlation Between Annual Budget Shortfall and Service Area.....	71
Figure 31: Aggregated Correlation Between Rates of Food Insecurity and Distributive Programming.....	72
Figure 32: Aggregated Correlation Between Cost per Meal and Distributive Programming ..	73
Figure 33: Aggregated Correlation Between Annual Budget Shortfall and Distributive Programming.....	74

LIST OF TABLES

Table 1: Texas Food Banks Across Counties	36
Table 2: Food Security Questions for Food Security Module (Feeding America)	47
Table 3: Variable and Aggregated Averages Across Texas Counties	75

ACKNOWLEDGEMENTS

I would like to begin by thanking my family, friends, and mentors who have supported me throughout the entirety of my collegiate experience. My mother and father, Irene and Daniel, consistently motivate me to accomplish my goals with their unwavering support. My sister, Danielle, is my rock who never fails to uplift and encourage me in my weakest moments. I will always cherish the supportive and loving bond that we share. My brother, Izaak, is someone I can always be myself with. With his impeccable humor, he can always provide me with a good laugh. I am especially grateful for my grandfather, Adolph, for believing in me enough to support me though the last four years without any hesitation.

I would like to give a special thank you to my mentors, Tiffany and Emil Cunningham, who have not only guided and pushed me academically, but have embraced me as part of their own family. I have endless love and appreciation for all the moments I have shared with them and their family. They have shown me nothing but love and kindness.

Most importantly, I'd like to thank my thesis supervisor, Brian King for his patience and guidance throughout this entire process. I've enjoyed learning from him since I first attended his Geography 30 class during my first year of college. His passion as well as his teaching style inspired me to return to his classroom again as a junior. At that time, I couldn't think of a better person to oversee and facilitate my work. He has always pushed me to think more critically about issues and explore their nature in an interdisciplinary fashion.

Chapter 1

Introduction

The period of 2007-2008 marked one of the most profound and important food crises in recent history. The impact of soaring food prices, increasing hunger, and declining access to food was felt across the globe. To highlight the severity of this event, a 2008 UN General Assembly report shows nominal prices of all major food commodities reached their highest levels in 50 years, prices in real terms reached the highest levels in nearly 30 years, and social unrest developed in more than 40 countries as a result (Golay, 2010). The devastation of the global food crisis was greater for impoverished and import-dependent countries; however, the effects were visible all over.

Although the U.S. had recorded progress in reducing its national food insecurity rate since a peak of 12% in 2004, the national rate of food insecurity rapidly rose to 14.8% by 2008 (Cometti, pg. 3). Levels of food insecure households jumped from 36.2 million in 2007 to 49.1 million by 2008 (UN, pg. 66). Declines in food expenditures as a share of household spending across middle-to low income households reflected a lack of affordability for many families who quickly relied on local food banks and other non-profit charitable organizations (UN, pg. 65-66). As a financial and economic crisis followed from 2009-2012, activists, policy-makers, governments, global leaders, and other stakeholders could not ignore the daily challenges faced by millions of families around the world in their attempt to overcome hunger and poverty to seek stable livelihoods that support a just and dignified way of life (FAO, pg. 3).

With such alarming numbers and outcomes, the global food crisis onset a new stage of food activism, advocacy, and support. For the first time ever, all UN agency heads were assigned to a high-level task force with the goal of developing solutions to malnutrition and hunger (Golay, 2010). A diverse group of social movement organizations aligned their efforts to establish the 2008 US Working Group on the Food Crisis, which later became the US Food Sovereignty Alliance (USFSA) in 2010 (Shawki, pg. 424). Since the establishment of the coalition, USFSA maintains its goals of drawing attention to the underlying causes of the crisis and promoting solutions to a broken system by rebuilding local food systems (Shawki, pg. 434). The activism of the group and its broader movement has played an influential role in informing and constructing policy from the federal to local level (Holt-Gimenez, pg. 1; Shawki, pg. 433-434).

As food activism has become a central part of addressing food insecurity through the promotion of new policies, programs, and initiatives across production, working, and consumer sectors, it is essential that these efforts and their development are thoroughly researched. There are a considerable number of stakeholders with varied interests amid the issue of food security including: agricultural workers (small-scale), corporate agribusiness, governments, policymakers, organizations, institutions of healthcare and education, as well as consumers. The pervasiveness of food insecurity across fields of disciplines is one that frames the issue as a wicked social problem, with no clear or universal solution. The complexity of food security has motivated existing literature to explore its structural causes, implications, and potential solutions. Although frameworks and practices are often criticized or celebrated, there is limited data that connects approaches to outcomes outside of policy briefs and organizational reports.

After familiarizing myself with U.S. food security across time, region, and approaches, it was increasingly clear that the research and findings are mixed. With multiple perspectives and interests at play, the reality of food security varies across space, socio-economic conditions, political mobilization, and many other confounding variables. To account for this, my thesis implements a niche focus of programming within food banks and outcomes for community food security across Texas counties following the global food crisis, 2011-2017. As a highly recognized and respected institution of food relief, food banks present an interesting and dynamic scope of research for which their role to community food security can be further evaluated.

This study builds on research and theory proposed by Vitiello and colleagues, who position food banks intermediate agent of change for community food security through their engagement in local agriculture. While Vitiello and colleagues focused their work on programs including farming, harvesting, gleaning, and garden support programs, my research broadens the sphere of influence by including all programs offered by each individual food bank. Specifically, I will qualitatively categorize programs as distributive or participatory and evaluate whether these two program models impact outcomes for food security across various Texas counties. As one of fifteen states with rates of insecurity above the federal average, there is a strong demand for aid and support (Feeding Texas, n.d.). In my evaluation of food banks, there exists an opportunity to generate new knowledge and information surrounding the utility of program modeling. With my work, I hope to further inform and motivate continued research related to the impact and role of food banks in community food security.

Chapter 2

Literature Review

The following literature review will contextualize the terminology, ideologies, theories, and findings upon which the foundation of my research is built. As mentioned previously, food security is a multifaceted issue by which understandings of this social dilemma must be clearly articulated to best inform my work. To begin, I will review literature related to the structural causes and implications of food insecurity, exploring a more nuanced term, community food security. Then, I will discuss existing research related to the salience, function, and developments within food banks. Lastly, I will briefly discuss food insecurity in the context of Texas to highlight the significance and value of this investigation.

Food Security: Structural Causes and Implications

In an era marked by globalization in which the world is immensely interconnected, it is difficult to imagine that food could be so scarce. Today's food system is characterized as a corporate food regime by which the global supply is linked to monopoly markets, agrifood corporations, and fuel (Holt-Giménez, 2010, pg. 1). With present realities and consequences of climate change, food has become a resource that is highly contested. Commonly identified implications of climate change have included rising rates of natural disaster, drought, flooding, declining agricultural production, loss in biodiversity, and water scarcity around the globe (FAO, 2017, pg. 9-11). Each of these issues directly affect the supply of food and further threaten the global food system by which all nations currently confront food insecurity

In the context of the U.S., food insecurity is often characterized by the prevalence of food deserts. Food deserts describe the phenomena by which communities face low levels of access to quality and healthy foods as a consequence of rapid urbanization. Historically, as large retailers and supermarkets flocked to urban and suburban neighborhoods, low income communities were left with a high density of convenience stores as their local and primary source of food (Cometti, pg. 2; Shawki, pg. 431; Thomas, pg. 1546). These communities rely heavily on convenience stores as a result of their accessibility despite their failure to offer fresh, nutrient-rich foods and produce. To further shed light on this disparity, Cometti references studies that suggest wealthier districts have three times as many supermarkets as poor neighborhoods, and Caucasian neighborhoods may have up to four times as many supermarkets as predominantly Black neighborhoods (Cometti, pg. 2). The term food desert captures the notion of scarcity for nutritious and quality foods within local communities. Aside from accessibility of quality foods, an overwhelming body of literature suggests there is a strong correlation between food insecurity and socioeconomic conditions, as well as geography.

Principally, a variety of historical, political, and social drivers have shaped food insecurity across income, minority status, family structure, location, age, and ability. The most susceptible groups include households with incomes near or below the poverty line, minority households, single parent households, inner city or rural residents, elderly people, and people with disabilities (Murrell and Jones, pg. 2). As Borrás explains, hunger, malnutrition, and food insecurity are the perils of the poor, marginalized, and socially vulnerable groups. This statement is captured in a 2016 study by the USDA in which the following groups reflected food insecurity greater than the U.S. federal average of 12.3%: “households with incomes less than 185% of poverty threshold, single-parent families headed by women (32%) households headed by Black

non-Hispanics (23%) or Hispanics (19%), and households with children (17%) (Borras & Mohammed, pg. 301).

Geographically, a 2016 USDA report found food insecurity to be greater in rural areas (15%) and metropolitan cities (14%) (Borras et. al., pg. 301). Following the notions of food deserts, greater insecurity in rural regions is logical, given access and availability of supermarkets is poor. While the same rationale cannot be applied to metropolitan areas, where access to supermarkets is greater, this finding alludes to another main component of food insecurity: affordability. In 1980, the Food and Agricultural Organization (FAO) broadened the scope of food security beyond physical access to include economic access, which is conventionally studied in terms of income, financial means, and purchasing power (Borras et. al, pg. 302). Unfortunately, the capitalistic and institutional structures of the global food system greatly impact these variables of economic access, especially during periods of food crisis and elevated prices. Trade liberalization, which allows for nations to access food and commodities that are not abundant domestically, produces mass concentrations of wealth and consolidated power in monopoly markets (Holt-Giménez, pg. 2). In the event of financial bust, consumers are confronted with rising prices, decreasing purchasing power, declining consumer confidence, and declines in household spending related to food (Holt-Giménez, pg. 2; UN, pg. 65). Across rural and urban communities, structural drivers such as the distribution of power, money, and other societal conditions influence levels of food insecurity by transforming living conditions (Borras et. al, pg. 301).

Access and affordability are prominent barriers to food security that develop through a variety of economic and social conditions that include environment, urbanization, socioeconomic status, and geography. As it becomes clear that particularly groups and communities are

especially vulnerable to the issue, it is imperative that research continues to draw attention toward communal responses and strategies. These efforts are critical to informing what mechanisms of food activism are adequate or inadequate in effectively addressing the disparities in accessibility and affordability of food.

Community Food Security

As the previous section articulates, food insecurity is a complex social issue that is influenced across multiple domains such as environment, social conditions, geography, and economics. The robust nature of this problem has demanded strong attention, research, and problem-solving globally, nationally, and locally. Although there is an insurmountable amount of responses to the issue of food security, two ideological frameworks have dominated U.S. food activism: food sovereignty and food justice.

Food sovereignty is outlined and defined as “the right of peoples to healthy and culturally appropriate food produced through ecologically sound and culturally appropriate methods, and their right to define their own food and agricultural systems” (Clendenning, pg. 169; Shawki, pg. 428). Advocates of food sovereignty seek to dismantle the corporate food regime by relinking agriculture, citizenship, and nature via a democratically controlled and regionally based food system. They seek to accomplish this by prioritizing production in local and domestic markets, demanding fair prices for producers, and increasing community control over natural resources (Alkon, pg. 347-350; Shawki, pg. 429-430).

While food sovereignty maintains a multilateral aim for addressing the food system at large, food justice seeks to address the local and domestic systems that have disadvantaged

communities of color and low socio-economic backgrounds. Strategies of food justice seek to strengthen localized food systems with short supply chains through rural–urban food buying groups and cooperatives, community supported agriculture, urban agriculture, and farmers’ markets (Clendenning, pg. 170). Simply, food justice aims to achieve anti-racism and equity within the food system (Holt-Giménez, pg. 4).

Despite their different ideologies and methodologies related to food insecurity, both frameworks place the community at the center of change and advocacy. Given this perspective, the concept of community food security is more fitting and salient to this project as it presents a keen focus on the importance of a community in restructuring their experience with food security. According to the Global Strategic Framework for Food Security and Nutrition by the FAO, food security is defined by the following:

“Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life” (FAO, pg. 6).

As a more nuanced term, community food security is outlined by the Community Food Security Coalition as:

“an emphasis on sustainable, local production with an anti-hunger perspective, arguing that all communities should have access to safe, culturally acceptable, nutritionally adequate, and sustainably produced diets” (Alkon et. al, pg. 348).

As Alkon explains, examining access from the community, rather than individual level, invites more structural analyses and efforts to reform both the industrial food system and food movements (Alkon, pg. 348).

With a clear vision of community food security, it is essential to unpack the existing literature regarding how this concept is applied. Community members and their participation in food activism are core to the principles of community food security. As Pothukuchi asserts, the participation of community members builds a sustainable operation of support and informs effective strategies (Pothukuchi, pg. 367) Of the many approaches to community food security including community gardening, policy, farmer's markets, and food banks, no one approach is more successful. Rather, the application of these solutions to the specific needs of a community build both reward and engagement.

This sentiment is well exemplified by Growing Power, a nonprofit food security organization based in Milwaukee that tackles food disparity through urban farming, local and community gardening, community programming, policy proposals, and lobbying at the state and national level. According to the research of Block and colleagues, the organization has developed partnerships with several stakeholders such as the University of Wisconsin-Madison, Chicago Food Policy Advisory Council, and the Growing Food and Justice For All Initiative to ensure their commitment to increasing access to safe and nutritious foods while advocating and empowering community based agriculture (Block, pg. 210). In collaboration with the Chicago Housing Authority, a notable success of Growing Power is a community-built garden with environmentally safe food production beds, hoop greenhouses, compost bins, and 75 raised bed wood boxes for community allotment production (Block, pg. 211). The garden represents a sustainable solution in terms of its environmentally conscious methods and ability to support long-term employment. As Block notes, residents are learning green technology skills that will make them highly employable as the demand for skilled urban farmers increases (Block, pg. 211).

However, policy is a critical element for activists to seek and demand institutional change that empowers local communities and restores more control to the people (Fairbarin, pg 223). A great example of this is the Reinvestment Fund of Pennsylvania by which the state provides grants and low interest loans to those interested in starting or expanding food access in underserved areas (Block, pg. 204). Whether through policy or practical solutions, proponents of community food security emphasize the rights of individuals and communities to define their food system, produce food safely, regulate production, and choose their level of self-reliance on national and international organizations (Block, pg. 205).

Farmer's markets are another common feature of community food security. To address systemic racial and economic inequalities in the production and distribution of food, these programs bolster local food systems by generating new flows of business and food. As Alkon highlights in his research, farmer's markets support local food entrepreneurs who are seen as key to a sustainable and just food system (Alkon, pg. 349). Following the devastation of Hurricane Katrina, Steve Canfield was one of many who worked on community development and eventually established the Hollygrove Market and Farm. While Steve was able to secure funding with the New Orleans Farm and Food Network to begin selling boxes of fresh produce, local dairy, and hormone free meat, only 10% of local residents are captured in sales. As the Hollygrove community remains one of the poorest, with 33% of homes unoccupied in 2010, it is likely that barriers to access lie in the weakened infrastructure and purchasing power of residents (Passidomo, pg. 390). Although the farmer's market was well-intentioned, the missing voice and participation of the community demonstrated a failure to combat financial barriers as individuals struggled to overcome the devastation of the natural disaster.

Lastly, Vitiello and colleagues discuss new strategies employed at food banks to increase the participation and role of communities in food activism. Based on their findings, over 85% of food banks and allied organizations rely on volunteers for distribution of food, yet over 40 food banks have begun to support individual involvements with processing, preparing, or selling food (Vitiello, pg. 424). For example, The Portland Fruit Tree project reserves half of its volunteer slots for individuals facing food insecurity who are able to take home half of the produce that they salvage from supermarkets. Additionally, by participating in harvesting and gleaning activities, these members gain valuable knowledge and skills for self-sufficiency and food preservation (Vitiello, pg. 425).

Organizations, policy, farmer's markets, and food banks are all viable approaches to addressing food insecurity. Existing literature highlights mechanisms by which each collectively produce success and failure. The research by Block outline community engagement as a source of sustainable support and empowerment for imposing change. Policy is recognized as another vehicle of structural change. Farmer's markets strengthen the local food system, most especially when they are well-informed of community issues and need. Vitiello et. al draws on building community knowledge and skills as food banks involve local constituents in agricultural programming.

While international, governmental, and non-state actors are increasingly important for shaping the developments in food insecurity, existing literature highlights the role and value of local and communal efforts to U.S. food activism. Specifically, communities operate as a centralized source of resources, advocacy, and human capital. Due to constraints of feasibility, I further explore food banks and their value to community food security. As a prominent and well-established institution of food relief, food banks offer a niche and constructive area of research.

Food Banks

Food banks are a specialized institution of food relief given that they are not solely a local resource for food, but rather a networking body that combines policy, programming, and distribution. Food banks acquire their supply of food from three main sources: food donations, government food programs, and purchased foods from acquired funds (Campbell et. al, pg. 263). To meet demand, food banks operate under a complex yet sophisticated network of warehouses, transportation, philanthropic organizations, advocates, and concerned volunteers (Campbell et. al, pg. 263). In addition to their partnerships, many food banks participate as members of Feeding America, a national network organization of hunger-relief. Although the complexity of stakeholders and partnerships within operations may be difficult to understand, essentially, food banks are an intermediate agent that connects donors to beneficiaries (Gintelini, pg. 8).

Food banks engage their recipients through a variety of modes that include food pantries, soup kitchens, on-site and partnered programming, and affiliated local agencies such as shelters, faith-based organizations, and other local food service groups. As food is collected from government food programs, regional and local retailers, producers and growers, as well as the Feeding America system, food banks store the food in warehouses where they will later be sorted and processed for distribution (Campbell et. al, pg. 263). The intricate yet profound reach of food banks is what makes this institution well-recognized and respected across the nation. As Webb writes, “the emergency food system has evolved from an ad hoc collection of disparate charitable groups to a much larger and more organized food distribution system that feeds approximately 12% of all US households, over 37 million people annually, of whom 14 million are children and nearly 3 million are seniors” (Webb, pg. 257).

Although it is important to acknowledge the significance of food banks, existing literature also highlights many shortcomings of food banks with strong critique. Food banks are often referred to as emergency food assistance as they were envisioned to be a short-term solution for those who are economically, geographically and socially disadvantaged (Bazerghi et. al, pg. 732). However, there is increasing evidence to suggest some people are coming to rely on food banks as their only source of food (Bazerghi et. al, pg. 732). This finding reflects one of the biggest challenges food banks face: the uncertainty of supply to meet demand. With a growing dependence on the institution, demand is unlikely to decrease. In their assessment of the food banking system, Bazerghi and colleagues confirm that the number of food banking clients is increasing while the volume of donations is inadequate or insufficient to meet such demand (Bazerghi, McKay, Dunn, pg. 738).

To further contribute to the concern, Jane Poppendieck in her critique of emergency food systems articulated the “seven deadly ‘ins’” of emergency food as: insufficiency, inappropriateness, nutritional inadequacy, instability, inaccessibility, inefficiency, and indignity (Vitello et. al, pg. 420). Poppendieck argues food banks often reinforce injustice and inequality within the food system by redistributing commodity surplus’ that allow corporate industries to further profit from mistakes such as oversupply or mislabeled goods. Additionally, Poppendieck highlights the strong reliance on donations and volunteers, with the notion that such a system casts beneficiaries as dependent and passive recipients of charity (Vitello et. al, pg. 420). This sentiment is echoed by Mark Winne who articulates the relationship with donors in the food banking system does little to empower the poor and take a strong stance against hunger (Vitello et. al, pg. 420).

Despite the critiques that reference food banks as merely a food security safety net, Vitello et. al acknowledges food banks as engines of community food security and justice (Vitello et. al, pg. 421). In their assessment of agricultural programming deployed by food banks, Vitello and colleagues recognize food banks as effective agents of community food security through their ability to build individual and community capacity via local participation (Vitello et. al, pg. 429). With the U.S. holding the largest number of emergency food beneficiaries, including some 37 million people, about one-in-eight Americans, or 12 percent of the population—food banks are a key institution for understanding food security (Gintelini, pg. 10).

Food Banks and Food Security in Texas

While the issue of food security is prevalent throughout the nation, Texas offers a unique landscape in which community food security can be explored. The state is abundant with natural resources and land that contribute to both its economic and population boom (Feeding Texas, n.d.) In fact, a 2020 U.S. Census report finds six of fifteen fastest growing cities since 2010 are located within the state of Texas (U.S. Census, 2020). As the Texas population rises, so does the demand for food, in which 1 in 7, or 4 million Texans experience food insecurity (Feeding Texas, n.d.). Demand for food may drive food insecurity across the state, but as existing literature as emphasized, there are many other factors that play a significant role in the experience of food security.

Texas combines regions of rural and urban populations that experience insecurity differently. According to the research and findings of Dean and Sharkey in their evaluation of food security in Central Texas, rural residents travel greater distances than urban residents to

supermarkets, which reduces their access to fruit and vegetables and is associated with lower consumption of these foods (Dean & Sharkey, pg. 1455). In an investigation of food security within rural and urban households in West Texas, Murimi et. al reports a greater levels of food insecurity for urban households, which is likely explained by persistent poverty in low-income communities (Murimi et. al, pg. 629). These findings suggest that food security in rural populations is more closely related to access while affordability is a greater concern for urban populations. However, this observation is misleading given all major determinants of food security, such as income and employment, must be considered in an assessment of community food security. To better illustrate this point, Feeding Texas features issues of affordability in rural populations related to limited or unreliable job opportunities and high rates of unemployment (Feeding Texas, n.d.).

Another characteristic of Texas that offers a unique opportunity to study community security is its size. As one of the largest states in the nation, Texas is commonly divided by region. With 254 counties across the state, 21 food banks actively work to supply food and combat food insecurity (Feeding Texas, n.d.) Below is a visualization of the state of food banking system.

254 COUNTIES

IN TEXAS PROVIDED WITH HUNGER RELIEF BY FEEDING TEXAS MEMBERS

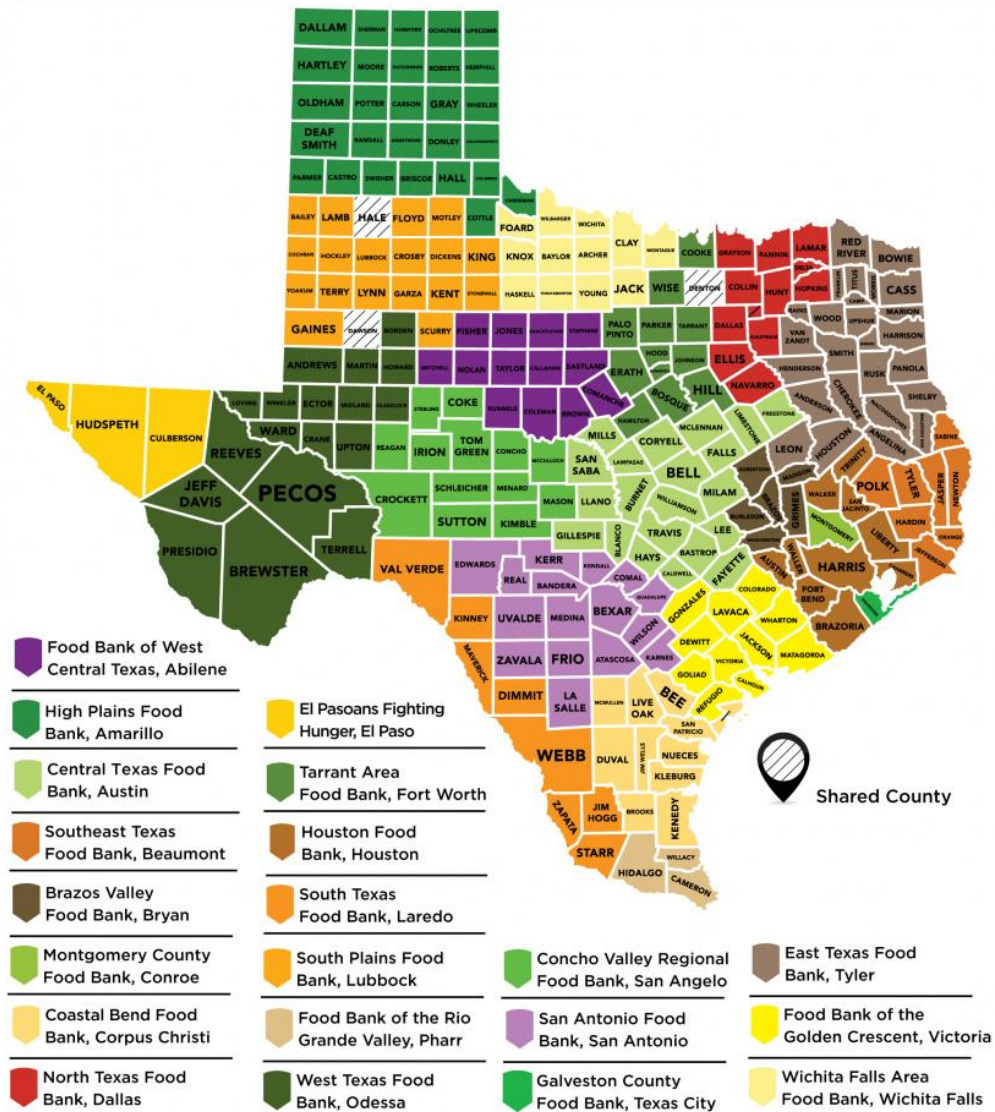


Figure 1: Map of Food Banks and Counties Served (Feeding Texas)

The disproportionate size of the state in relation to the number of food banks presents a problem. There exists a great challenge to adequately meet the needs of each individual community. To supply sufficient foods to individual regions, food banks must have quality system of distribution. Of the three main component of food banks proposed in the conceptual

framework of Bazerghi et. al, we can see that organizational capacity is important to the operation of Texas food banks.

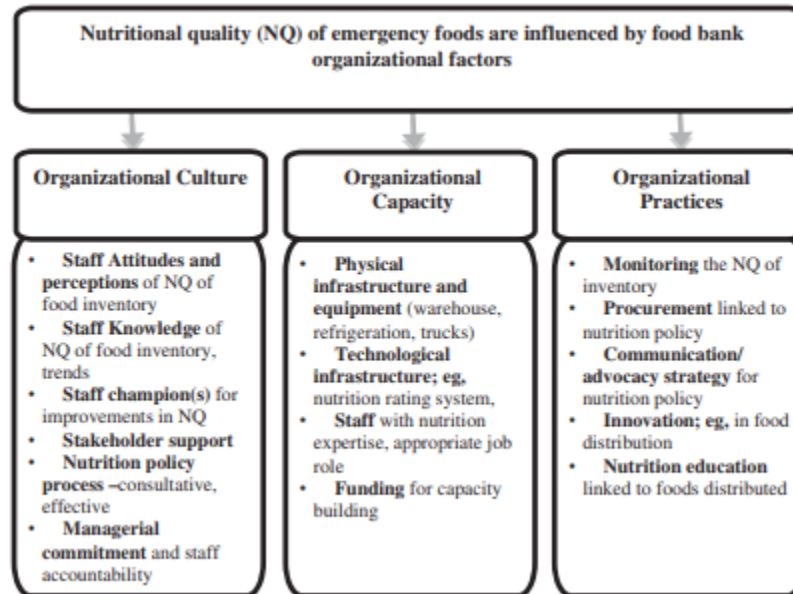


Figure 2: Bazerghi et. al's Conceptual Framework for Nutritional Quality Within Food Banking System

In order to meet the present and growing demand for food across each region, proper equipment, infrastructure, personnel, and funding are necessary. Many of these apparent obstacles informed and motivated my interest in assessing the role of food banks across Texas counties. Furthermore, the existing literature regarding food security in Texas draws heavily on social determinants such as population, rural-urban complexities, and to the issue of food insecurity

Chapter 3

Theory

With six of fifteen of the fastest growing cities located in Texas, the issue of food insecurity couldn't be anymore salient (U.S. Census, 2020). With averages of food security in the state well above the national average, local governments and institutions must be prepared to meet a growing demand for food (Murimi et. al, pg. 629; Feeding Texas, n.d.).

Texas relies heavily on its 21 food banks to service and provide food for 254 counties (Feeding Texas, n.d.). Although food banks are not the only resource for which residents can acquire food, they are some of the most established and endorsed institutions for combating food security in the region. As existing literature explains, food banks operate as networks of resources and programming working to alleviate food insecurity throughout communities. Therefore, it is imperative that food banks are analyzed and evaluated for their contributions to the communities they serve. Additionally, examining their effect on food security outcomes may provide new information and knowledge about their effectiveness.

While Vitello et. al. examines the role of food banks related to their engagement with local agriculture, I seek to employ a modified study of food banks that draws heavily from the theoretical arguments. Specifically, I will categorize and analyze the different programs deployed across food banks within Texas by classifying each as distributive or participatory. I anticipate that the different models of programming will yield different outcomes for community food security.

Models Matter

Beyond the operations of the food banking system, program models present another dimension in which the institution must be researched and evaluated. As mentioned previously, food banks combine many different programming that include food pantries, soup kitchens, on-site programs, and partnered programs with schools, local organizations, and affiliated groups such as churches and shelters. For the premise of my research, I build upon the theoretical arguments within the research of Vitello et. al and qualitatively categorize current and available programming as distributive or participatory. Distributive programming is characteristic of providing either food or a service to individuals. Fundamentally, the encounter is merely an exchange. In contrast, participatory programming involves the engagement of recipients. Participatory programming is more of an experience by which individuals are able to learn, work, or partake in the food service activities.

Distributive Programming

The basis on which I conceptualize distributive programming is related to the arguments of Poppendieck as well as some key findings within existing literature. In her critique of the emergency food system, Poppendieck references food banks as bodies of charities that disempower and disengage community members. To further her arguments, Poppendieck draws attention to the reliance of upper income volunteers to meet organizational demand, which reinforces an inequitable system that celebrates the service of volunteers while casting recipients as poor and dependent (Vitello et. al, pg. 420). Unfortunately, the concept of dependency has been confirmed by existing research that finds food banks to be a primary and local source of food for food insecure households (Bazerghi, pg. 738). Although the distribution of food is

important for improving access, it does little to empower and alleviate the issue of affordability.

Based on these findings, I offer the following hypothesis:

H1A: *Food banks deploying programming that is more characteristic of distributive models are likely to witness higher levels of food insecurity across variable outcomes.*

Participatory Programming

In stark contrast to the arguments presented by Poppendieck, Vitello et. al recognizes food banks as agents of community food security via community engagement. According to their findings, the research suggests that involvement of community members in local initiatives of agriculture can improve education, skill, and capacity for food security. At the Portland Fruit Tree project, participation in harvesting and gleaning activities allowed individuals to gain valuable knowledge and skill set for self-sufficiency and food preservation (Vitiello, pg. 425). The development of 30 community gardens at local schools within Chester County allowed for educational programming between students and teachers (Vitiello, pg. 426). The practical skills and knowledge that are built by community participation empower the individual's food literacy and ability to navigate food security. It is expected that new knowledge and skill building enrich new attitudes, behaviors, and decision-making surrounding food.

Most importantly, research has shown that community members involved in processes of growing and distributing food strengthens community capacity and networks of social and economic support, including but beyond food production and distribution (Vitiello, pg 428). Community capacity and networks of social and economic support can be better defined as social capital –the ability for a social actor to create or employ access to a social collectivity of resources (Dean et. al, pg. 1455). As Dean et. al argues in his research, social capital has strong effects for mitigating food security as it enriches a collective social function and expands social

relations (Dean et. al, pg. 1455). As communities enrich their knowledge of the food system, food production, and nutrition, it can collectively advocate and mobilize resources to overcome food insecurity. Consistent with this understanding, individual-level indicators of social capital were positively associated with higher levels of fruit and vegetable intake in Central Texas (Dean et. al, pg. 1455). Understandings related to community engagement and developments of food security inform the following hypothesis:

H1B: *Food banks deploying programming that is more characteristic of participatory models are likely to witness lower levels of food insecurity across variable outcomes.*

Location and Proximity

In addition to the model structure under which programs take effect, I expect location and community proximity to food banks to be contributing factors regarding food security outcomes. As existing literature explains, geography plays a significant role in levels of food security regarding both access and affordability. Access is determined by factors that include distance, available transportation, and time constraints. Without the ease of access to foods, the issue of food insecurity persists.

In my research, I will examine how location of food banks as well as their proximity to counties will affect outcomes for food security. With 21 food banks servicing 254 counties in Texas, food banks are more regional than local. Most counties are unable to easily access a food bank in their locality and rely strongly on the distribution system to provide the food. Therefore, I would expect that food banks have a greater effect on outcomes for food security within the counties for which they are placed locally.

H2: *Communities in which the food bank is localized are likely to experience lower levels of food security across variable outcomes.*

Service Area

The level of distribution is a major component to the success and operations of food banks within Texas. This is largely a function of the disproportionate nature of food banks to counties. With 21 food banks supplying 254 counties, food banks are strategically regionally based. As a result, there is disparity within the respective service area of each food bank, the number of counties a food bank is responsible for. To account for this disparity in my research, I record the number of counties serviced within each respective food bank. To better illustrate this idea, I discovered that the San Antonio Food Bank distributes across 29 counties, meanwhile, the South Texas Food Bank serves 8 counties.

It is expected that the relative service area is a function of factors such as level of food security in each county, infrastructure, demand, and organizational capacity. However, limited data and available research of these variables encouraged me to explore the effect of service area on food security outcomes. Assuming that food banks with a smaller service area operate under a weaker organizational capacity, it is expected that these communities experience higher levels of food security. Applying the same logic to food banks with larger service areas, theoretically, these institutions comprise a larger network of resources that positively impact their organizational capacity. With a larger endowment of resources and capacity, one can expect lower levels of food insecurity across these communities. I offer the following hypotheses:

H3A: *Communities serviced by food banks with smaller service areas are likely witness*

higher levels of food insecurity across variable outcomes.

H3B: *Communities serviced by food banks with larger service areas are likely witness lower*

levels of food insecurity across variable outcomes.

Chapter 4

Data and Methods

The goal of my project is to evaluate the effect of program modeling on outcomes for food security within Texas communities. The unit of analysis for this study is Texas counties. Due to constraints in time and feasibility, this study examines ten Texas counties selected after controlling for growth rate and population size. Controlling for these variables helps mitigate the likelihood of capturing data that reflects confounding variables such as urbanization, increasing median income, employment rates, etc. The key independent variable for this research design is program models utilized by food banks. To assess their effect on community food security, I operationalize food security in each county by three variables: rates of food insecurity, cost per meal, and annual budget shortfalls.

To carry out my investigation of program modeling within the food banking system across Texas counties, my research combines both quantitative and qualitative methods. Using the Feeding America Map the Meal Gap datasets from 2011-2017, I constructed my own dataset that combines the following county-level variables: rates of food insecurity, cost per meal, annual budget shortfalls, population size, and the percent of population above, below, and between federal threshold. Other resources used to construct demographic profiles for each county, measure their metropolitan status (MSA) and growth rate include the U.S. Census Bureau, Texas Department of Health Service, and the World Population Review.

Qualitatively, I tracked all current and available programming by each food bank and navigated their websites. After compiling a list of programs, I categorized all current and available food programs across the eight investigative food banks using a keyword search. Using the provided explanations of each program, I assigned a program as distributive or participatory

if the given explanation utilized keywords that represented the principles of each program model. The criteria and keywords by which I coded individual programs can be referenced in Appendix A: Program Categorization Utilizing Keyword Search.

To properly assess whether program modeling affects community food security, I chose to include three dependent variables: rates of food insecurity (FI), cost per meal (CPM) and annual budget shortfalls (ABS). Given that there are numerous confounding variables related to food insecurity, these three variables work to increase the reliability of the research and capture both aspects of food security: access and affordability. I would also argue that these variables are valid measures for understanding community food security.

Food Security (FI) Variable

Although there are ample datasets for food security across local groups, governments, states, and federal organizations, I specifically chose Feeding America due to their conventional research methods that are well adapted and suitable for analyzing food security at the community level. Feeding America's research approach to community food security begins with the conventional standard by the U.S. Department of Agriculture (USDA): the Core Food Security Module, which complies 18 respondent questions that assess whether a household is food insecure (Reference Appendix A: Technical Appendix). Feeding America analyzes the relationship between food security and its determinants such as poverty, median income, unemployment, homeownership rates, percent of the population that is African American and percent of the population that is Hispanic at the state level and county levels (Feeding America, pg. 4). Using coefficient estimates from state models as well as a separate county level analysis, Feeding America generates estimates of community food security for each county (Feeding America, pg. 4).

Cost per Meal (CPM) Variable

In order to calculate the cost per meal at the county level and generate data that is comparable across counties, Feeding America utilizes a research model developed by Nielsen Scantrack Service that standardized a coding scheme for food items across 26 food categories outlined in the USDA's Thrifty Food Plan (Feeding America, pg. 16). In a robust research model, the cost per meal is calculated using data metrics for the market cost (sales tax and county tax) and weights in each category --pounds of food purchased each week according to the USDA Thrifty Food Plan (TFP) (Feeding America, pg. 16). The complexity of this model does contribute to some research bias and error in which the market price estimates may be inflated due to unavailable data.

Annual Budget Shortfall (ABS) Variable

The annual budget shortfall variable reflects the amount of money needed to provide households with the means to overcome food security. To estimate this value per county, Feeding America begins with the following question:

“In order to buy just enough food to meet (your needs/the needs of your household), would you need to spend more than you do now, or could you spend less?”

Of respondents that answer more, the following question is posed:

“About how much MORE would you need to spend each week to buy just enough food to meet the needs of your household?”

Given that these questions originate from the Core Food Security Module (CFSM) which record food security at the household level, that recorded values are divided by the number of people per household. Based on the research model, the per-person figure for how much money is needed to achieve food security is \$17.74 (Feeding America, pg. 13) The USDA annual

Household Food Security report finds that food insecurity is experienced for 7 months of the year. Therefore, the annual budget shortfall estimates are developed by a research equation that multiplies the per-person figure by 52 (weeks per year) and 7/12 (annual food security) and includes estimation values for county food security and population (Feeding America, pg. 14).

Limitations

The methods of research employed in this study do not come without challenge. Throughout the process of investigation, limited or unavailable data for analyzing food banks was a major hurdle. Although a regression analysis is critical in articulating the strength and significance of the relationship between program modeling and food security outcomes, this was not possible due to a lack of available datasets regarding operations and programming at food banks. Of the data collected for food banks, there was no variance over time in which a regression analysis could be completed. Despite this shortcoming, the trend analysis employed helps to visualize the correlation between the food security variables with respect to programming and service area. Additionally, I was able to analyze trends in rates of food insecurity alongside population growth for each county. While these findings fail to determine and evaluate an existing relationship between program models and community food security, the trends and correlation results are informative and offer a potential opportunity for future research.

To mitigate the issue of unavailable or limited data, this research could have utilized survey methods or interviews with the food banks. However, with constraints in time and feasibility, this was not possible. Without these research tools, it is very difficult to quantify the

capacity of each food bank as well as the community participation. The voice of staff, partnered affiliates, and community members within the research process would provide a greater context to the role, impact, and challenges faced during engagement of community food security. The qualitative approach to quantifying the programs deployed by food banks is a valid measure, however, given its reliance on information provided by the food bank webpage, it is unclear whether this project is fully informed of all available programs. Furthermore, it assumes the listed programs were available during the investigative timeline of 2011-2017.

When approaching food security research, there are a considerable number of measures that should be included based on purpose and intent. Given that I was exclusively focused on food security outcomes, it was logical for me to include the rates of insecurity, cost per meal, and annual budget shortfalls. Developing demographic profiles for each county that included race breakdown, percentages of food insecure individuals above, below, and between federal benefit income eligibility, and median income, helped me to gain a better understanding of food insecurity in each county by its determinants. The list of variables are insightful, but meek to the conventional metrics throughout academia and research. Some important factors that may contribute to this research but were not explored include infrastructure, employment rates, and purchasing power.

Chapter 5

Results

The main goal and purpose of this thesis is to evaluate the effect of programming modeling within food banks to food security outcomes within Texas counties. Due to constraints in timing and feasibility, when controlling for population size and growth rate of the 254 Texas counties, I selected the following counties as my units of analysis. Figures 3 and 4 can be referenced as demographic profiles for each county related to population breakdown by race and income.

County	2010 Growth Rate	2011 Population	% of White	% of Black	% Hispanic
Hardin	6.43	55,061	86.1	5.6	6.0
Henderson	6.79	78,938	77.4	6.4	13.6
Hopkins	7.29	35,313	72.8	7.4	17.4
Kerr	6.70	49,686	68.3	2.0	27.4
Navarro	7.10	48,138	54.7	13.3	28.5
Starr	6.98	61,823	3.3	0.4	96.4
Taylor	5.82	134,095	62.7	8.4	25.0
Upshur	8.95	39,920	80.3	7.9	9.1
Victoria	6.46	89,067	43.9	6.6	47.8
Walker	6.95	68,408	56.1	23.6	18.1

Figure 3: County Demographic Profile by Racial Breakdown

County	% FI below threshold	% FI between threshold	% FI above threshold	Median Income
Hardin	49.9	9.6	40.5	\$60,339.00
Henderson	67.0	8.9	24.0	\$47,355.00
Hopkins	65.8	8.9	25.2	\$52,078.00
Kerr	65.6	7.4	27.0	\$55,990.00
Navarro	70.2	8.2	21.5	\$48,529.00
Starr	100.0	0.0	0.0	\$30,387.00
Taylor	66.5	5.7	27.9	\$53,143.00
Upshur	58.6	11.3	30.1	\$52,162.00
Victoria	66.8	4.6	28.6	\$56,834.00
Walker	47.3	7.0	45.7	\$43,742.00

Figure 4: County Demographic Profile by Income

The dependent variables for which I measured food security include rates of food insecurity, cost per meal, and annual budget shortfalls. To assess program modeling, I utilized a keyword search to categorize programs as distributive and participatory, and then recorded the level of distributive and participatory programs across the food banks in each county. Therefore, in my assessment of program modeling, there are only 10 observations—the extent to which the food relief institution is distributive or participatory in each investigative county (Figure 5). Figure 5 also includes data related to the service area of each food bank which reflects the number of counties serviced by the respective food bank.

County	FB	DP	PP	Program Total	% of DP	% of PP	Service Area
Hardin	Southeast Texas FB	6	3	9	0.666666667	0.333333333	8
Henderson	East Texas FB	6	6	12	0.5	0.5	26
Hopkins	North Texas FB	6	7	13	0.461538462	0.538461538	13
Kerr	San Antonio FB	10	8	18	0.555555556	0.444444444	29
Navarro	North Texas FB	6	7	13	0.461538462	0.538461538	13
Starr	South Texas FB	9	0	9	1	0	8
Taylor	FB of West Central Texas	8	1	9	0.888888889	0.111111111	13
Upshur	East Texas FB	6	6	12	0.5	0.5	26
Victoria	FB of Golden Crescent	3	1	4	0.75	0.25	11
Walker	Houston FB	9	5	14	0.642857143	0.357142857	18

Figure 5: County-level Dataset Regarding Food Bank Modeling and Service Area

Some notable observations based on the individual dataset is that all programming within the South Texas Food Bank are Distributive. Other food banks whose program models are overwhelmingly distributive are the Food Bank of West Central Texas and the Food Bank of Golden Crescent. Although there is no food bank that prominently feature participatory programming, about half of available programming at the North Texas Food Bank and East Texas Food Bank are participatory. In regard to the service area, the San Antonio Food Bank as well as the Food Bank of West Central Texas service the greatest share of counties. These findings are summarized in regard to their respective counties to better reflect the research design (Figures 6 and 10)

Distributive	Mixed	Participatory
Starr (1)	Kerr (.55)	Hopkins (.53)
Taylor (.88)	Upshur (.5)	Navarro (.53)
Victoria (.75)	Henderson (.5)	-
Hardin (.66)	-	-
Walker (.64)	-	-
-	-	-

Figure 6: Program Modeling by County

Framing the research in terms of counties is useful in testing the proposed hypothesis. According to H1A: “Food banks deploying programming that is more characteristic of distributive models are likely to witness higher levels of food insecurity across variable outcomes”, we would expect Starr, Taylor, Victoria, Walker and Hardin to have the highest levels of food security across all three variables: rates of insecurity, cost per meal, and annual budget shortfalls.

Following the proposed hypothesis of H1B: “Food banks deploying programming that is more characteristic of participatory models are likely to witness lower levels of food insecurity across variable outcomes”, we can expect Hopkins and Navarro to have the lowest levels of food insecurity across the independent variables. Figures 7, 8, and 9 compile aggregated trends for each dependent variable across counties and is useful in testing the previous hypotheses.

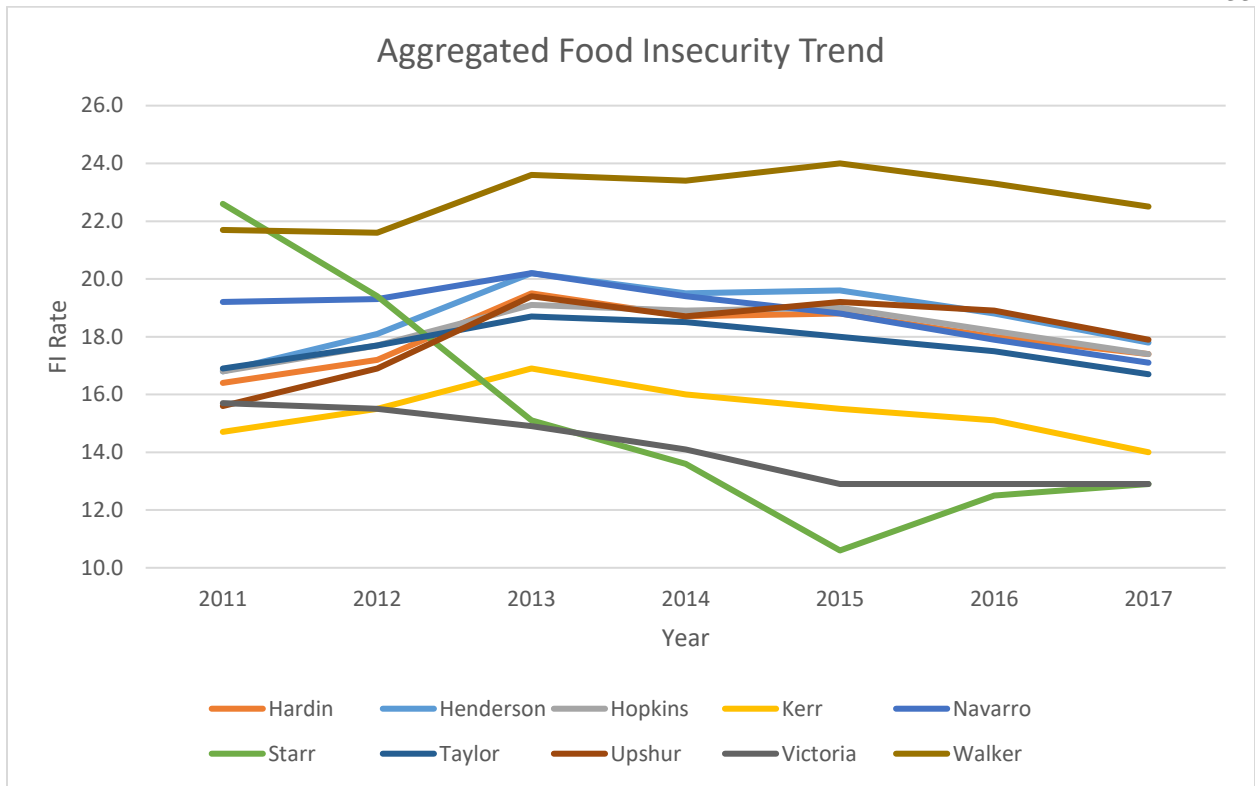


Figure 7: Food Security Trend Across Counties

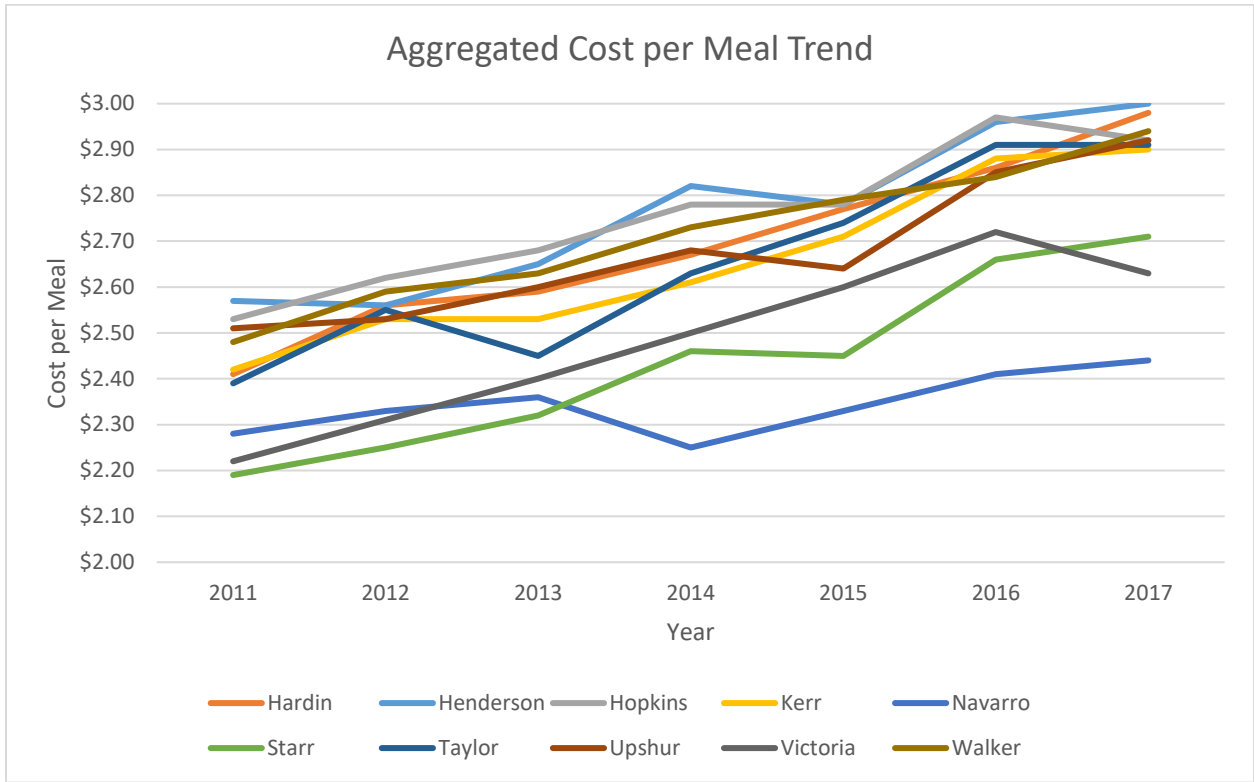


Figure 8: Cost per Meal Trend Across Counties

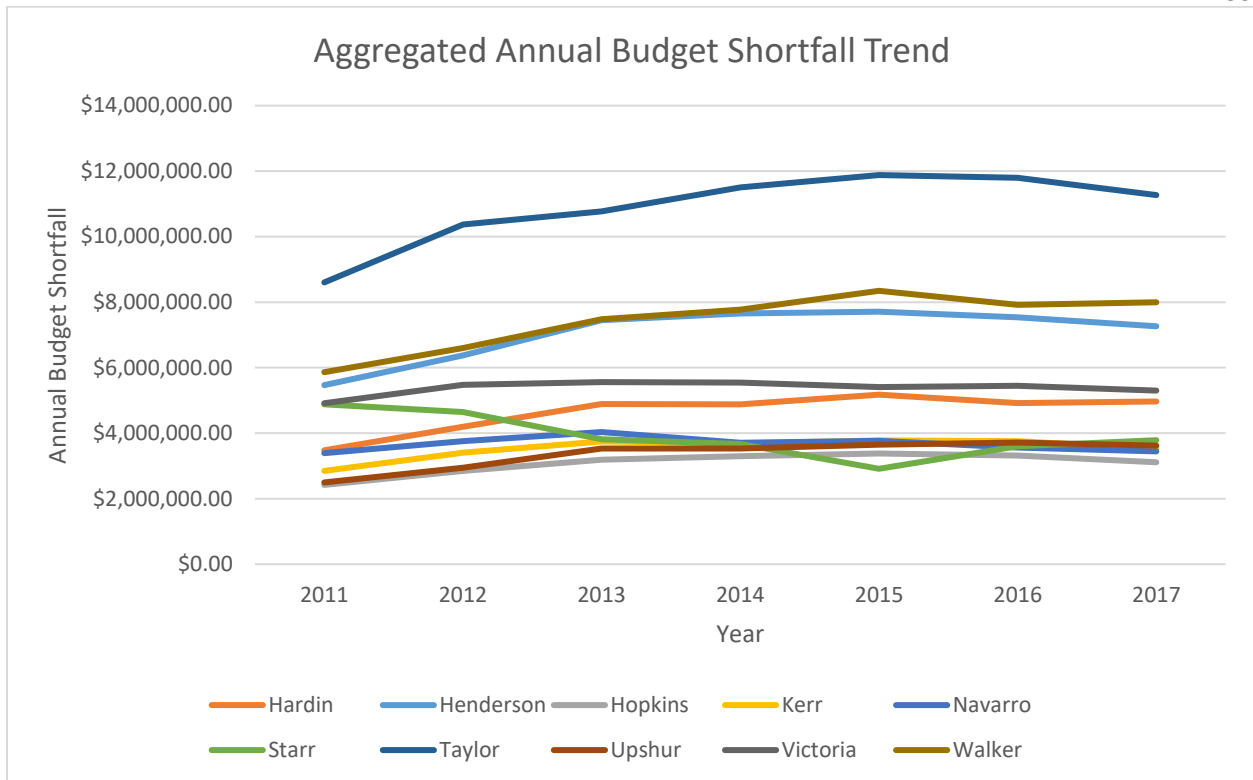


Figure 9: Annual Budget Shortfall Trend Across Counties

Based on Figures 7, 8, and 9, I am unable to confirm either H1A or H1B. Although the hypothesized research predictions are fitting for some trends, the results are not consistent. For example, Hopkins does have one of the lowest levels of food insecurity under the measure of annual budget shortfalls, but it maintains one of the most elevated cost per meal over time. Similarly, Taylor has the greatest value in annual budget shortfalls, which reflects high food insecurity, but the county maintains comparable levels of cost per meal and food insecurity rate to the other investigative counties. The only county that is fitting to the proposed hypotheses, is Walker, which maintains one of the greatest values across these three variables of food insecurity.

Table 1: Texas Food Banks Across Counties

Food Bank Code	Food Bank	Location	Country Served	Localized	MSA
1	FB of Golden Crescent	Victoria	Victoria	Yes	Yes
2	San Antonio FB	Bexar	Kerr	No	No
3	Houston FB	Harris	Walker	No	No
4	South Texas FB	Webb	Starr	No	No
5	North Texas FB	Collin	Hopkins; Navarro	No	No
6	East Texas FB	Smith	Upshur; Henderson	No	No
7	Southeast Texas FB	Jefferson	Hardin	No	Yes
8	FB of West Texas	Taylor	Taylor	Yes	Yes

Regarding location (Reference Table 1), H2 expects that within counties for which food banks are localized, levels of food security will be lower across all measures. Referencing Figures 7, 8, and 9, I am also unable to affirm H2. Taylor and Victoria are theorized to maintain the lowest levels of food insecurity across the dependent variables as a result of their local food banks, but the results are inconsistent. While Victoria does maintain lower values over time in regard to its cost per meal and food insecurity rates, the county does poorly within the annual budget shortfall variable. Across the three variables, Taylor maintains more elevated levels of food insecurity.

Large SA	Mid	Small SA
Kerr (29)	Walker (18)	Hardin (8)
Henderson (26)	Navarro (13)	Starr (8)

Upshur (26)	Hopkins (13)	Victoria (11)
	Taylor (13)	

Figure 10: Service Area by County

Lastly, H3 theorized food security outcomes related to the service size of food banks as follows: “H3A: Communities serviced by food banks with smaller service areas are likely witness higher levels of food insecurity across variable outcomes” and “H3B: Communities serviced by food banks with larger service areas are likely witness lower levels of food insecurity across variable outcomes.” Figure 10 offers a summary of research findings related to service areas of each food bank in terms of respective counties. Based on this figure as well as the hypotheses provided, it is expected that Victoria, Starr, and Hardin will have the most elevated level of insecurity across these measures while Kerr, Henderson and Upshur reflect the lowest levels. Based on figures 7, 8, and 9, I am unable to confirm H3A or H3B due to inconsistent results. Contrary to the theory, Starr has one of the lowest values across all three measures. Victoria also scores low for cost per meal and food insecurity rates. Henderson also is well suited to alternative hypothesis given that maintains greater levels of food insecurity across the three measures. Lastly, while Kerr does demonstrate low levels of food insecurity related to the annual budget shortfall and rates of food insecurity, the county has a more elevated cost per meal.

Key Findings

To further my understanding and knowledge about how food banks affect outcomes for food security in relation to program models and service area, I also completed a correlational analysis (Reference Appendix A: Correlational Analysis). With this tool, I can better visualize the nature of the relationship between variables. Although I am unable to articulate whether a relationship is significant, nor provide a value for any relationship, this trend analysis informed an important key finding throughout my research.

After aggregating correlations between variables across the seven-year timeline, most of the relationships were consistent throughout the period of analysis. Simply, there were no years in which the direction of correlation had switched from positive to negative. However, when examining the correlations between participatory programming and service area with rates of food security, the years 2011 and 2012 showed an opposing directional trend (Reference Figures 11, 12, 13, 14).

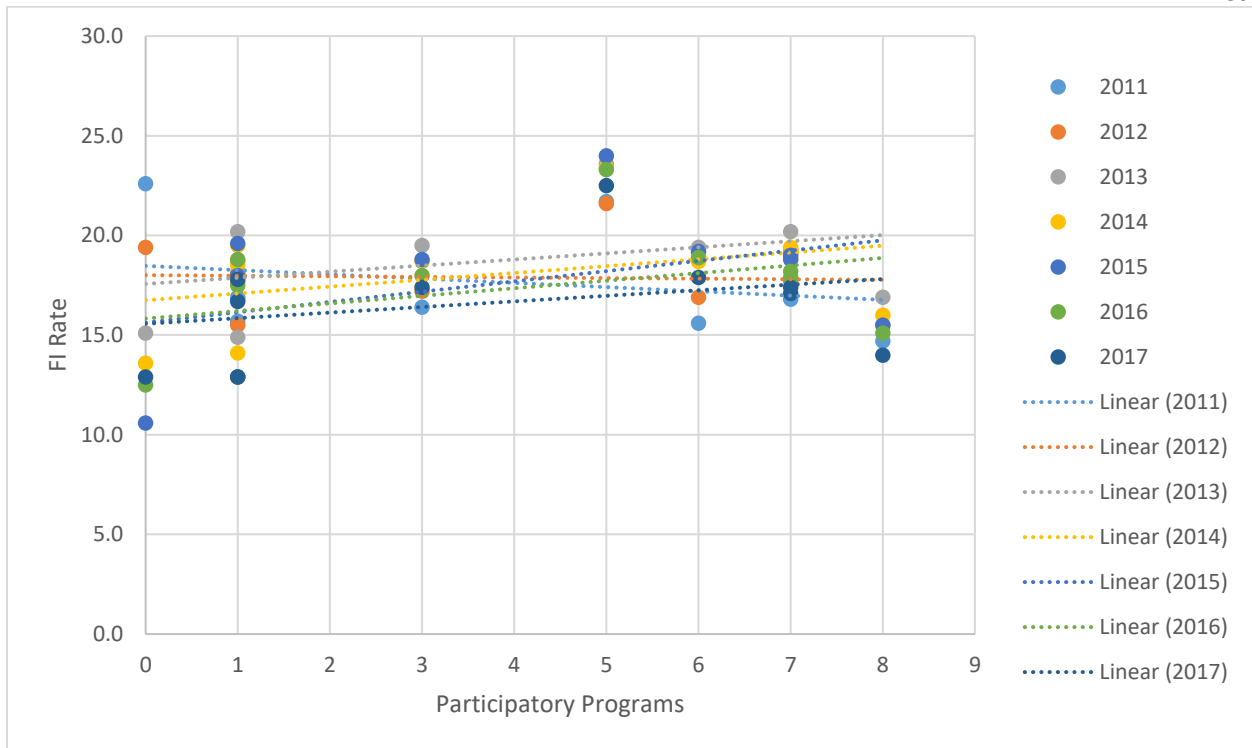


Figure 11: Aggregated Correlation Between Rates of Food Insecurity and Participatory Programming

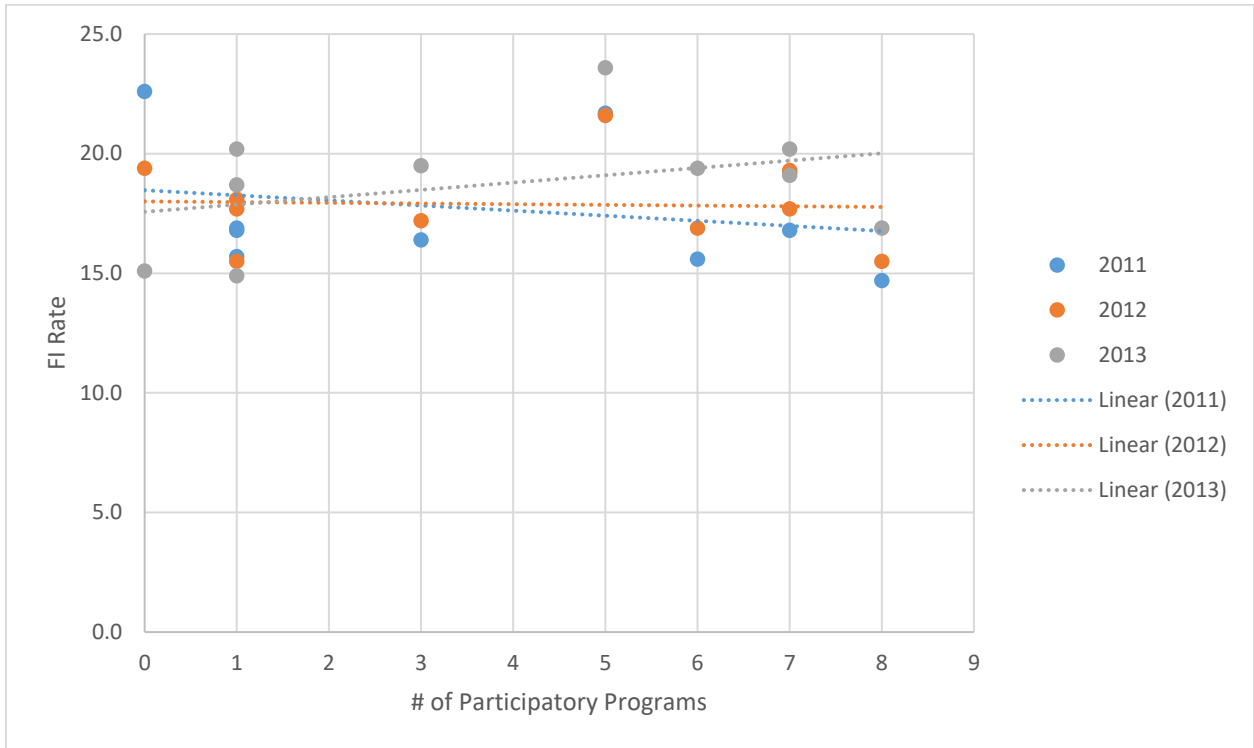


Figure 12: Opposing Trend in 2011 and 2012 for Aggregated Correlation Between Rates of Food Security and Participatory Programming

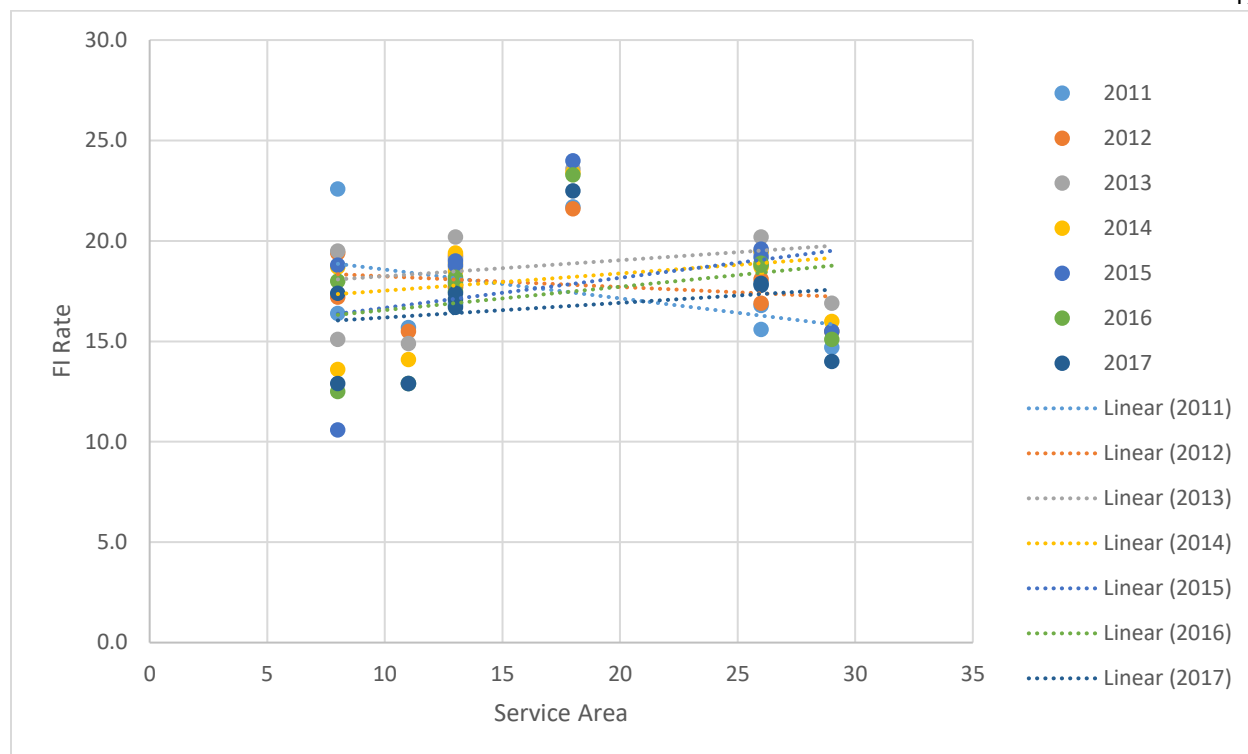


Figure 13: Aggregated Correlation Between Rates of Food Insecurity and Service Area

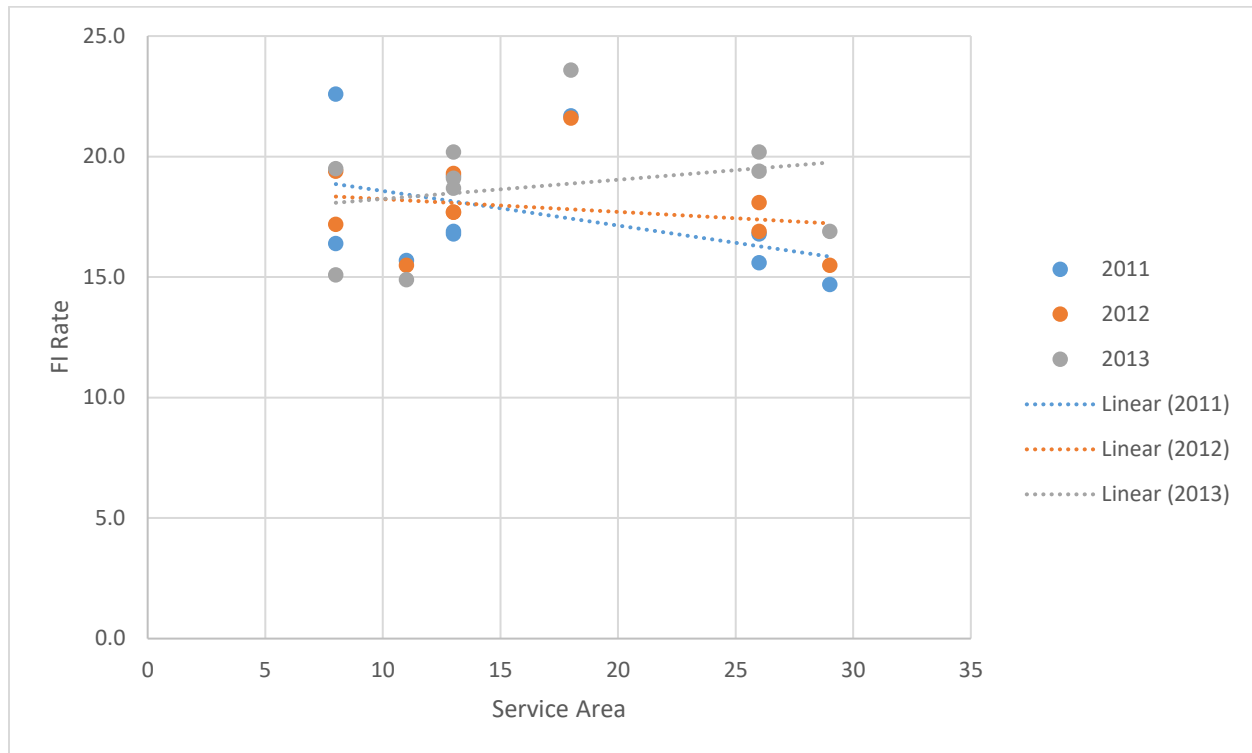


Figure 14: Opposing Trend in 2011 and 2012 for Aggregated Correlation Between Rates of Food Insecurity and Service Area

While my research offers little to no explanation for this occurrence, I examined the trends for food security across counties (Reference Appendix A: Trend Analysis) and was shocked to realize that the common trend across all counties with the exceptions of Starr, Walker, and Victoria, were a general increase in food insecurity rates from 2011-2013, following a general decline through 2017. I quickly recalled from the literature that this period experienced some level of food crisis as the nation attempted to recover from the 2008 food crisis and remained in financial and economic turmoil (FAO, pg. 3). Based on these findings, I suspect rising food prices, declining food expenditures, and declining purchasing power amid food crises' may have driven an increase in rates food insecurity that is captured by these models for 2011 and 2012. Further investigation would have to be explored to evaluate this assumption.

Implications

Although I was unable to effectively evaluate the effect of programming modeling to community food security, my results yielded valuable information. While my aggregated trends of food security outcomes across counties produces mixed results in which I was unable to affirm any given hypothesis, my correlational analysis demonstrates a positive relationship between distributive programming across all food security outcomes (Reference Appendix: Correlational Analysis, Figures 31, 32, and 33). Therefore, my theory about distributive programming decreasing levels of food insecurity cannot be completely ruled out, rather, it requires further and more complete investigation.

I was also disappointed that I could not carry out a regression analysis for which I can more comprehensively examine the causal mechanisms at play. However, I was thrilled to discover a finding by Murimi et. al in which urban households were more likely to participate in SNAP than were rural households (51% vs 17%; $P<.001$) and rural households were more likely to participate in the Emergency Food Assistance Program than were urban households (31% vs 2%; $P<.001$) (Murimi et. al, pg. 628). This finding reflects the principle that food bank programming is being accessed and utilized differentially across communities. While I focused my attention to program models, future research must continue to evaluate the utilization of programming within communities to better inform their effectiveness in alleviating barriers to food security.

Chapter 6

Conclusion

The issue of food insecurity is pervasive as it spans time, region, age, race, and ability. As existing literature has emphasized, food insecurity reflects poor access and affordability for foods as a result of social and economic drivers such as climate change, concentrations of wealth within financial markets, and inequitable distribution of power and resources within the food system. By consequence, consumers have little to no control over their food supply and are subjected to rising prices, limited availability for foods, and constraints in purchasing power. Given the challenge of aligning stakeholder interests that include corporations, governments, international institutions, grassroot organizations and consumers, research has more recently explore a more nuanced field of community food security.

Community food security recognizes community members as the key to solving issues of insecurity as a source of advocacy and resources. Activists of community food security seek to bolster the local production of food and alleviate barriers to accessibility and affordability of foods by empowering community members to participate in efforts. There are many different approaches that include community gardening, local and state policy, farmer's markets, and food banks. Current and previous research has studied these methods and evaluated their success and failures. Generally, there does not exist a solution that is applicable across all social drivers such as age, region, race, etc. This truth solidifies build upon the notion that community members are central to the issue. Organizational and institutional bodies must effectively identify the specific barriers, need, and community profile and tailor their work to these factors to better address food

insecurity. Additionally, it is imperative that these groups to continue to research food security related to outcome measures to assess the effectiveness of their work.

While there is a rich and wide variety of food resources across stakeholders, food banks represent a sophisticated institution of networks that is well-recognized and established in the U.S. The first food bank was established in Arizona around the 1970s. By 1977, the food banking network grew to 18 cities nationally. Today, Feeding America acts as a national network organization of food relief which manages a total of 200 food banks in the U.S. (Feeding America, n.d.). As an institution, food banks are utilized by 1 in 8 Americans, approximately 12 of the total population (Ginetilli, pg. 10). For as long as food insecurity exists, the institution of food banks shall prevail.

Food banks combine the three main streams of food:

1. the mainstream, market-oriented food system currently dominated by large corporations
2. the charitable food assistance network made up of food banks, food pantries, and soup kitchens
3. the federal nutrition safety net with programs targeted at poor children and adults, pregnant women and nursing mothers, and seniors. (Pothukuchi, pg. 357)

With such a robust list of partnerships that span large retailers, local affiliates, federal programming, and grassroot organizations, food banks are a vital resource to communities.

Although existing literature offers conflicting results and arguments about practices with the emergency food system model, the growing clientele and demand for food demonstrate their value as an institution of food relief.

Although food banks have the potential to drive change in levels of food insecurity, the lack of available information regarding their operations prevent a clear understanding of their role to community food security. Food banks may have the organizational capacity to distribute and produce food around the nation, but are they building social capital and community resilience by which communities are given the tools to overcome barriers to food security? While the institution primarily increases access to food through its chain of distribution, how do food banks address the issue of affordability outside of federal programming? As my research seeks to understand, how do program models affect outcome for community food security?

My research of program modeling offers a new perspective under which food banks can be evaluated. Principally, it seeks to understand the extent to which distributive and participatory models are able to affect outcomes for food insecurity. The results yielded mixed findings that suggest there is a positive relationship between distributive models and food insecurity outcomes. Additionally, a key observation suggests periods of food crisis may have stronger effects for food insecurity. Both areas of research must be further explored to confirm these findings using more comprehensive and complete research methods. Overall, as food banks remain a prominent feature of food relief and assistance, future research must develop innovative and robust strategies for evaluating their effectiveness in alleviating community food security.

Appendix A

Technical Appendix

Table 2: Food Security Questions for Food Security Module (Feeding America)

Food Insecurity Questions in the Core Food Security Module
ASKED OF ALL HOUSEHOLDS
1. “We worried whether our food would run out before we got money to buy more.” Was that often , sometimes , or never true for you in the last 12 months?
2. “The food that we bought just didn’t last and we didn’t have money to get more.” Was that often , sometimes , or never true for you in the last 12 months?
3. “We couldn’t afford to eat balanced meals.” Was that often , sometimes , or never true for you in the last 12 months?
4. In the last 12 months, did you or other adults in the household ever cut the size of your meals or skip meals because there wasn’t enough money for food? (Yes/No)
5. In the last 12 months, did you ever eat less than you felt you should because there wasn’t enough money for food? (Yes/No)
6. (If yes to Question 4) How often did this happen— almost every month , some months but not every month , or in only 1 or 2 months?
7. In the last 12 months, were you ever hungry, but didn’t eat, because you couldn’t afford enough food? (Yes/No)
8. In the last 12 months, did you lose weight because you didn’t have enough money for food? (Yes/No)

9. In the last 12 months did you or other adults in your household ever not eat for a whole day because there wasn't enough money for food? (**Yes/No**)

10. (If yes to Question 9) How often did this happen—**almost every month, some months** but not every month, or in only 1 or 2 months?

ONLY ASKED OF HOUSEHOLDS WITH CHILDREN

11. “We relied on only a few kinds of low-cost food to feed our children because we were running out of money to buy food.” Was that **often, sometimes**, or never true for you in the last 12 months?

12. “We couldn't feed our children a balanced meal, because we couldn't afford that.” Was that **often, sometimes**, or never true for you in the last 12 months?

13. “The children were not eating enough because we just couldn't afford enough food.” Was that **often, sometimes**, or never true for you in the last 12 months?

14. In the last 12 months, did you ever cut the size of any of the children's meals because there wasn't enough money for food? (**Yes/No**)

15. In the last 12 months, were the children ever hungry but you just couldn't afford more food? (**Yes/No**)

16. In the last 12 months, did any of the children ever skip a meal because there wasn't enough money for food? (**Yes/No**)

17. (If yes to Question 16) How often did this happen—**almost every month, some months** but not every month, or in only 1 or 2 months?

18. In the last 12 months did any of the children ever not eat for a whole day because there wasn't enough money for food? (**Yes/No**)

Note: Responses in bold indicate an affirmative response

Program Categorization Utilizing Keyword Search

Program List by Food Bank

1. Food Bank of Golden Crescent

- Backpack Program
- Victoria Farmer's Market
- Nutrition Education
- Hunters for the Hungry

2. San Antonio Food Bank

- Backpack Program
- Farmer's Market Nutritional Program
- Sustainable Garden
- Urban Farm
- San Juan Farm
- Culinary Training Program
- Warehouse Training Program
- Texas Second Chance Program
- Benefits Assistance Program
- Job Assistance Program
- Food Pantries
- Food Fairs
- Hunters for the Hungry
- Mobile Mercado

- Kids Café
- Summer Meals Program
- Project Hope
- Commodity Supplemental Food Program

3. Houston Food Bank

- Backpack Program
- School Market Program
- Teachers Aid Program
- Red Barrels Program
- Community Kitchen
- Nutrition Education
- Community Resource Center
- Food for Change Program
- Community Assistance Program
- Food Pantries
- Mobile Pantry
- Soup Kitchen
- Kids Café
- Senior Box Program

4. South Texas Food Bank

- Backpack Program
- Adopt-A-Kid Program

- Summer Food Service Program
- Child and Adult Care Food Program
- Mobile Pantries
- Adopt A-Family Program
- Commodity Supplemental Food Program
- Ranchers for the Hungry
- Hunters for the Hungry

5. North Texas Food Bank

- Food 4 Kids (Backpack Program)
- School Pantries
- Summer Food Service Program
- Partner Gardens at Elementary Schools
- Jan's Garden
- Partner Gardens
- Jan's Garden Workshops
- Nutrition Education
- Food 4 Health
- Healthy Pantry Nudges Project
- Commodity Supplemental Food Program
- Mobile Pantries
- Food Pantries

6. East Texas Food Bank

- Backpack Program
- Kids Café and Afterschool Program
- Summer Food Program
- My Plate Program
- Cooking Matters Program
- Nutrition Sessions
- Direct Education Program
- Healthy Pantry Nudges Program
- Benefits Assistance
- Commodity Supplemental Food Program
- Food Pantries
- Mobile Pantries

7. Southeast Texas Food Bank

- Backpack Program
- School Tools Program
- Retail Store Pickup Program
- Nutrition Education
- Social Services Enrollment Program
- Mobile Pantries
- Commodity Supplemental Food Program
- Emergency Food Assistance Program
- Food Pantries

8. West Central Food Bank

- Backpack Program
- Afterschool Program
- Benefits Assistance
- Emergency Food Assistance Program
- Mobile Food Pantries
- Rural Distribution Program
- Food Pantries
- Soup Kitchens
- Daycare Program

In my operationalization of food bank modeling, I utilized a keyword search by which I was able to categorize programs as distributive or participatory based on the provided definitions and explanations of each program. In conjunction with findings from existing literature, keywords for distributive models include: “distribution”, “commodities”, “donations” “surplus”. Keywords for participatory models include: “learning”, “education”, “knowledge”, “skills”, and “training”. The table below provides examples of the process of categorization utilizing a keyword search.

Food Bank	Program Title	Provided Description
San Antonio Food Bank	Texas Second Chance	“6-month (100 hour) program providing professional training in warehousing, inventory, and culinary skills coupled with the opportunity to gain

		certifications, licenses, and a sense of accomplishments”
Houston Food Bank	Red Barrels	“Red Barrels offer a convenient way for grocery shoppers to donate nonperishables to their neighbors in need through nearby food pantries.”
Food Bank of West Central Texas	Emergency Food Assistance	“a federal program that helps supplement the diets of low-income Americans, including elderly people, by providing them with emergency food and nutrition assistance at no cost. It is a cooperative effort between HHS, Feeding Texas, Texas Department of Agriculture, and USDA to efficiently and effectively distribute nutritious commodities ”
North Texas Food Bank	School Pantry Program	“Enrolled students and their families can access non-perishable items, as well as fresh produce, through participating schools. Distribution occurs once a month, typically after school. Students who visit the school pantry leave with 20-25 pounds of shelf-stable food items and 15 pounds of produce”
North Texas Food Bank	Jan’s Garden	“a learning and demonstration garden that acts as a living and breathing display of nutritious food options. Jan's Garden offers tours and programming for all local community groups who desire to learn

		first-hand about the impact that healthful food choices can make.”
--	--	--

Food Security Trend Analysis Per County

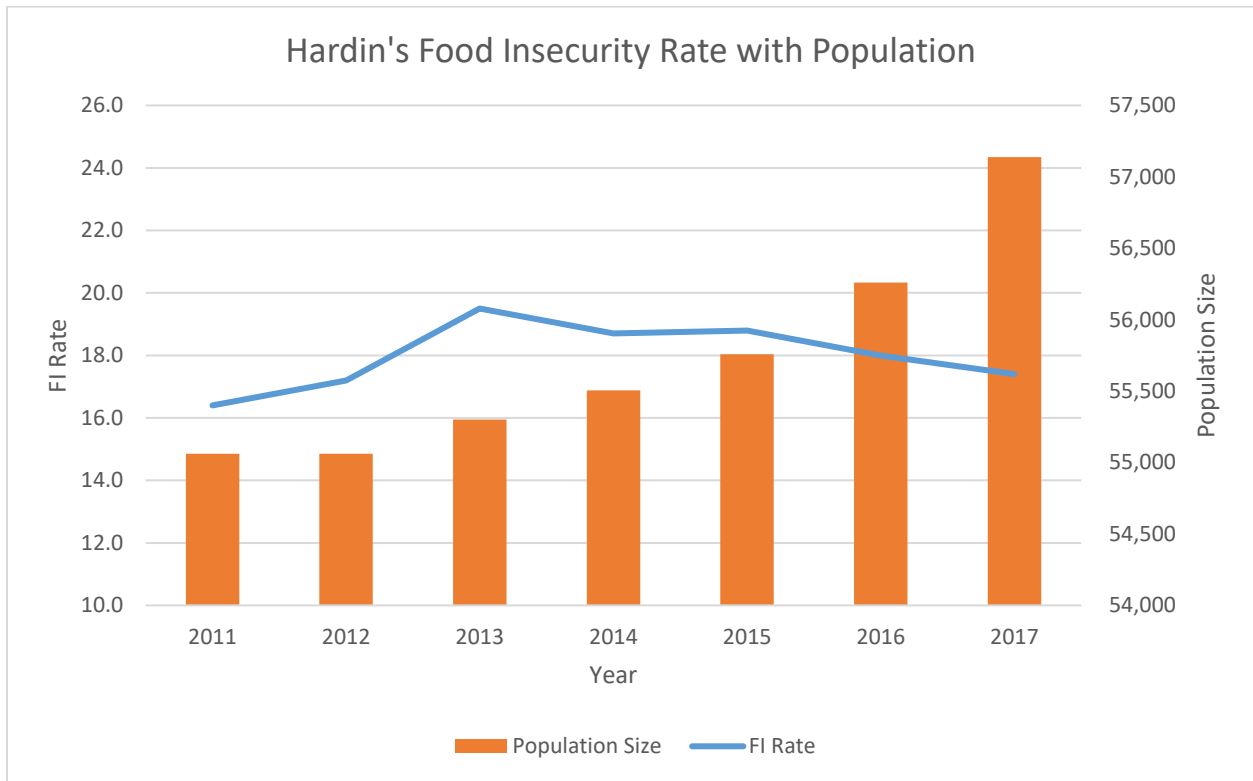


Figure 15: Food Security and Population Trend: Hardin County

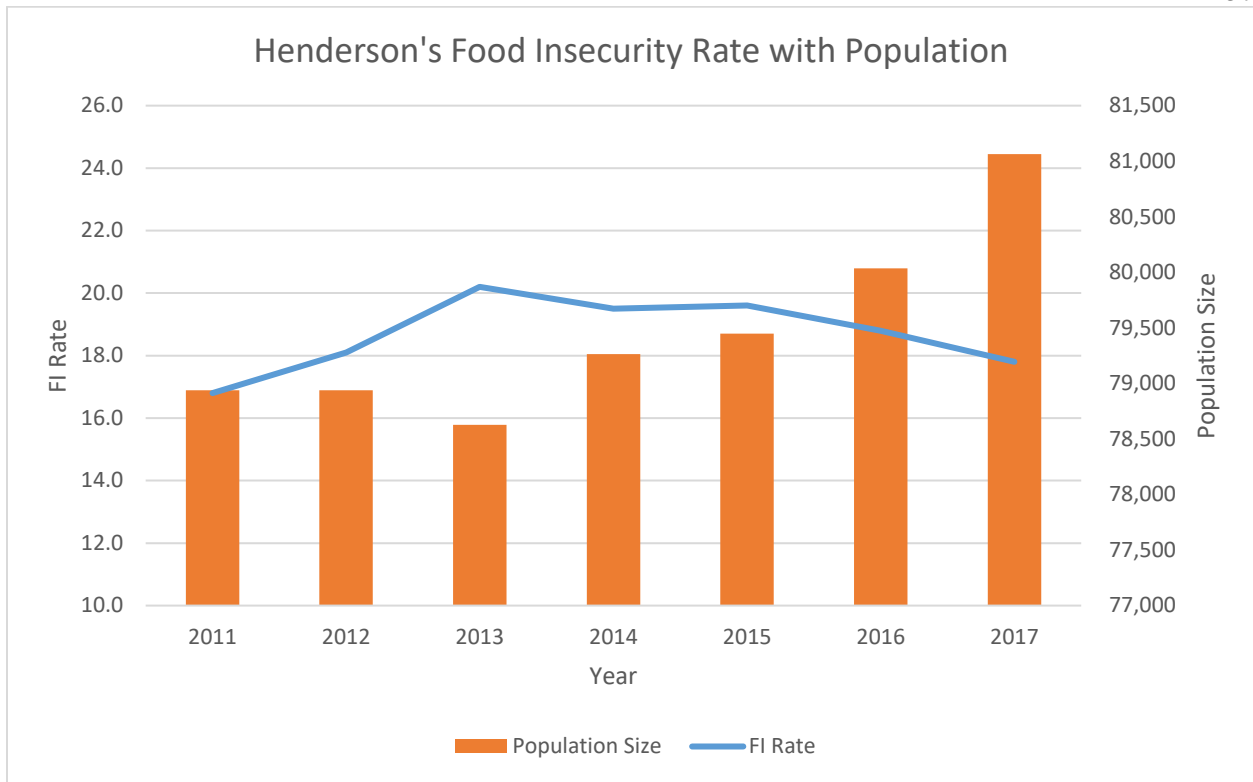


Figure 16: Food Security and Population Trend: Henderson County

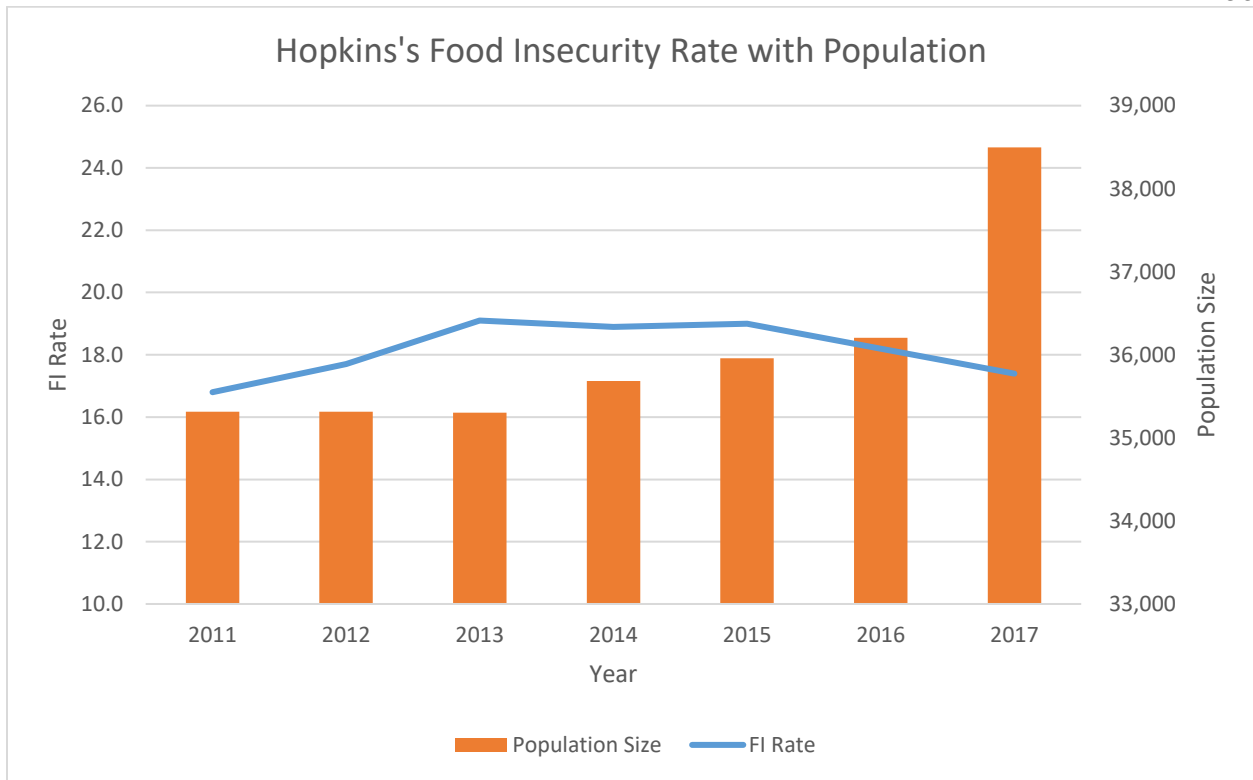


Figure 17: Food Security and Population Trend: Hopkins County

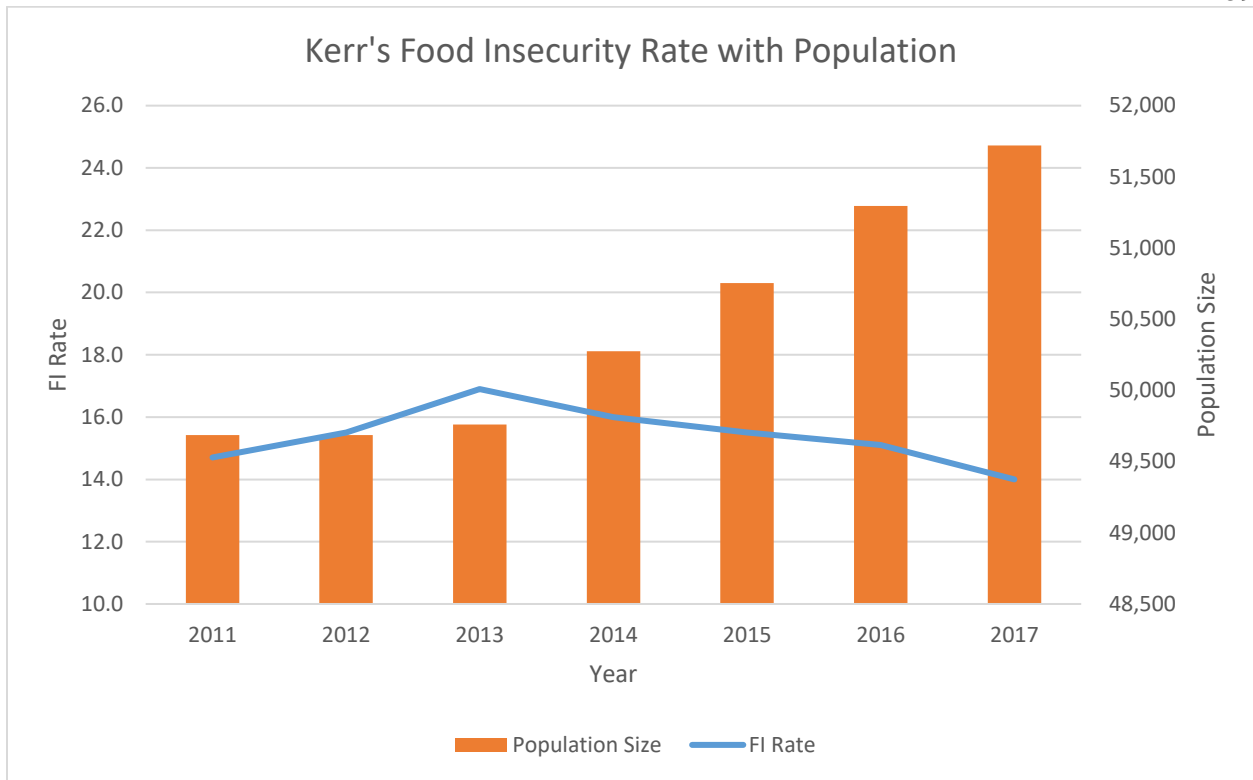


Figure 18: Food Security and Population Trend: Kerr County

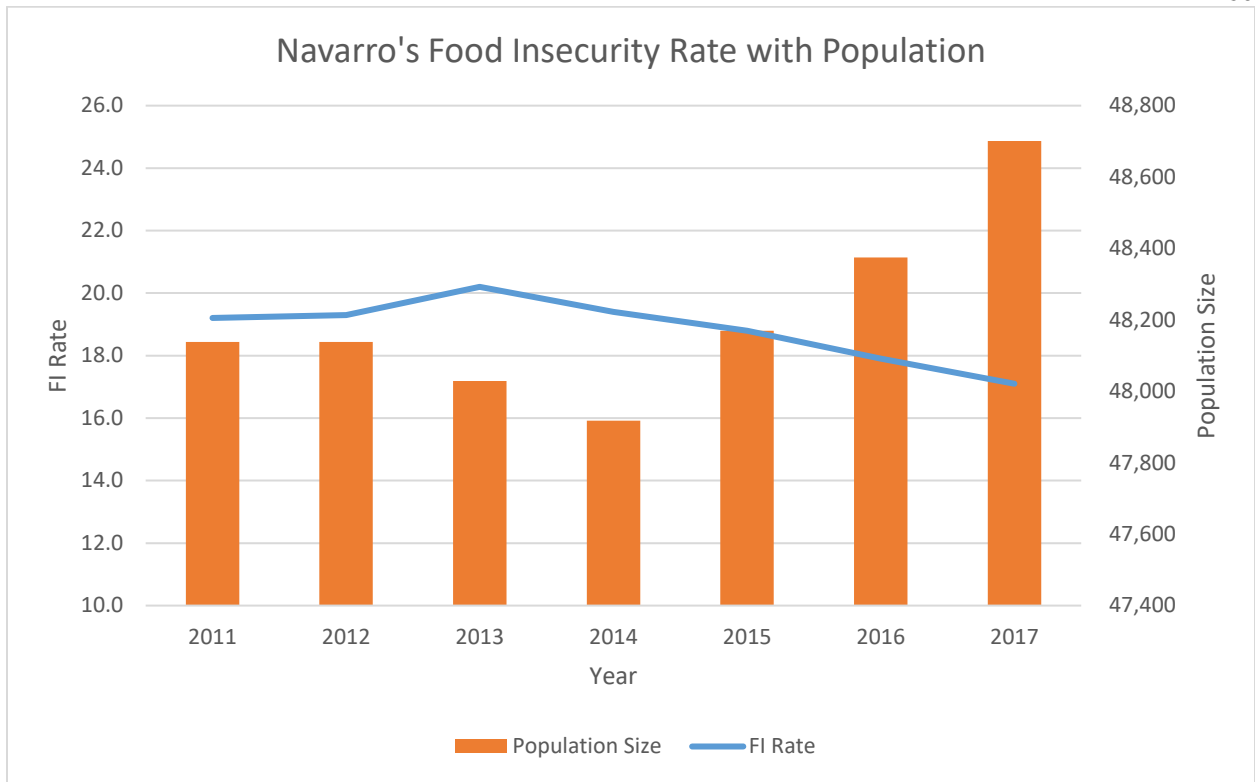


Figure 19: Food Security and Population Trend: Navarro County

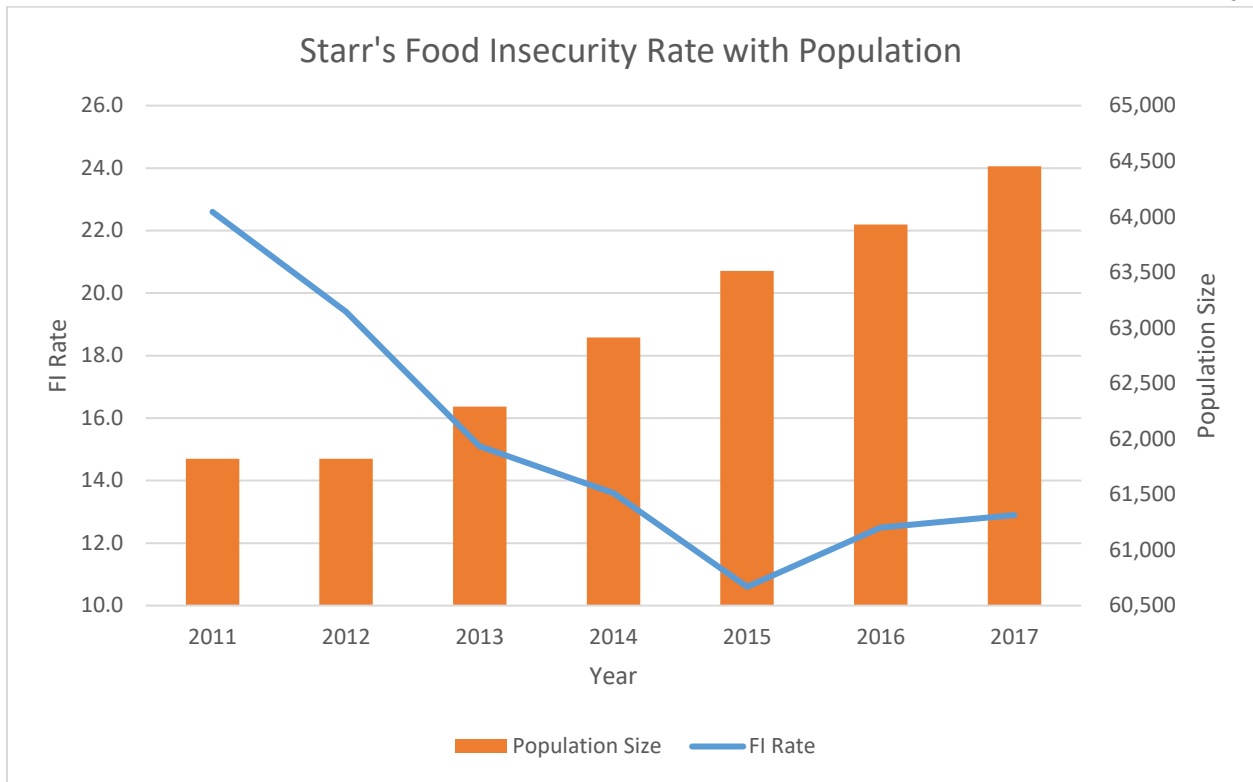


Figure 20: Food Security and Population Trend: Starr County

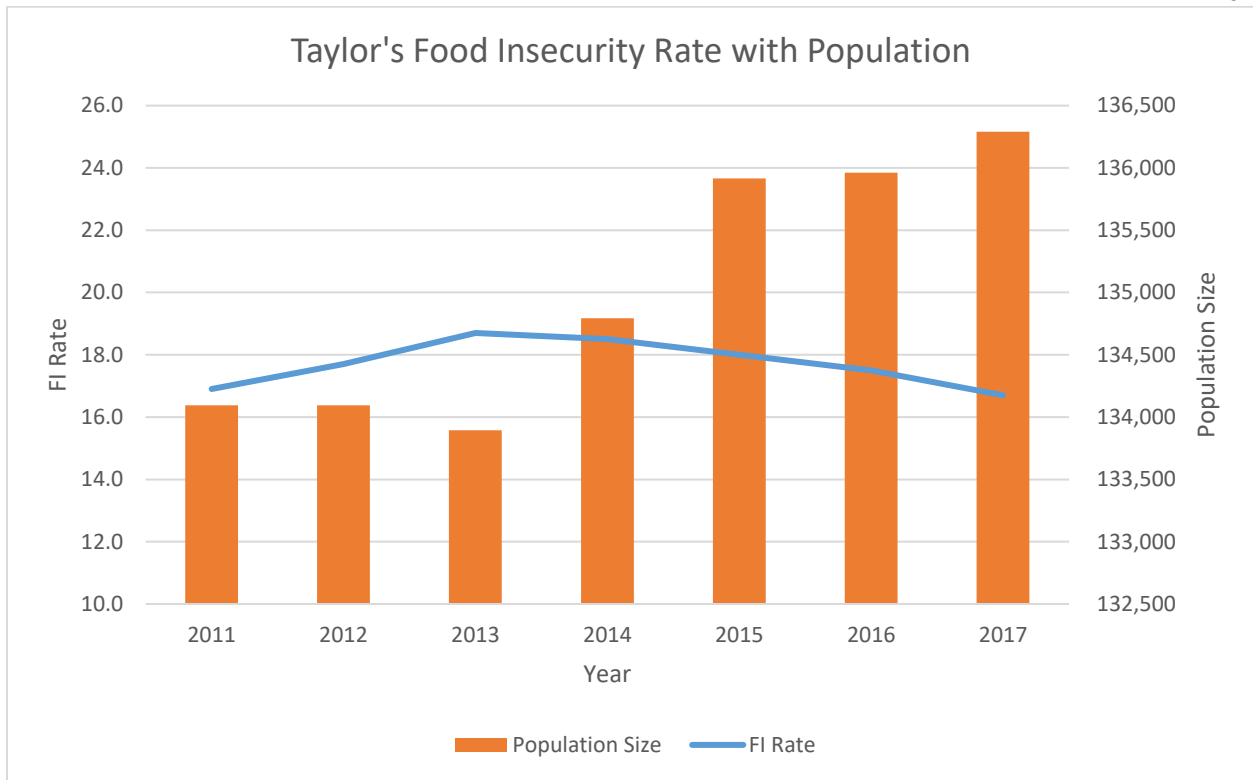


Figure 21: Food Security and Population Trend: Taylor County

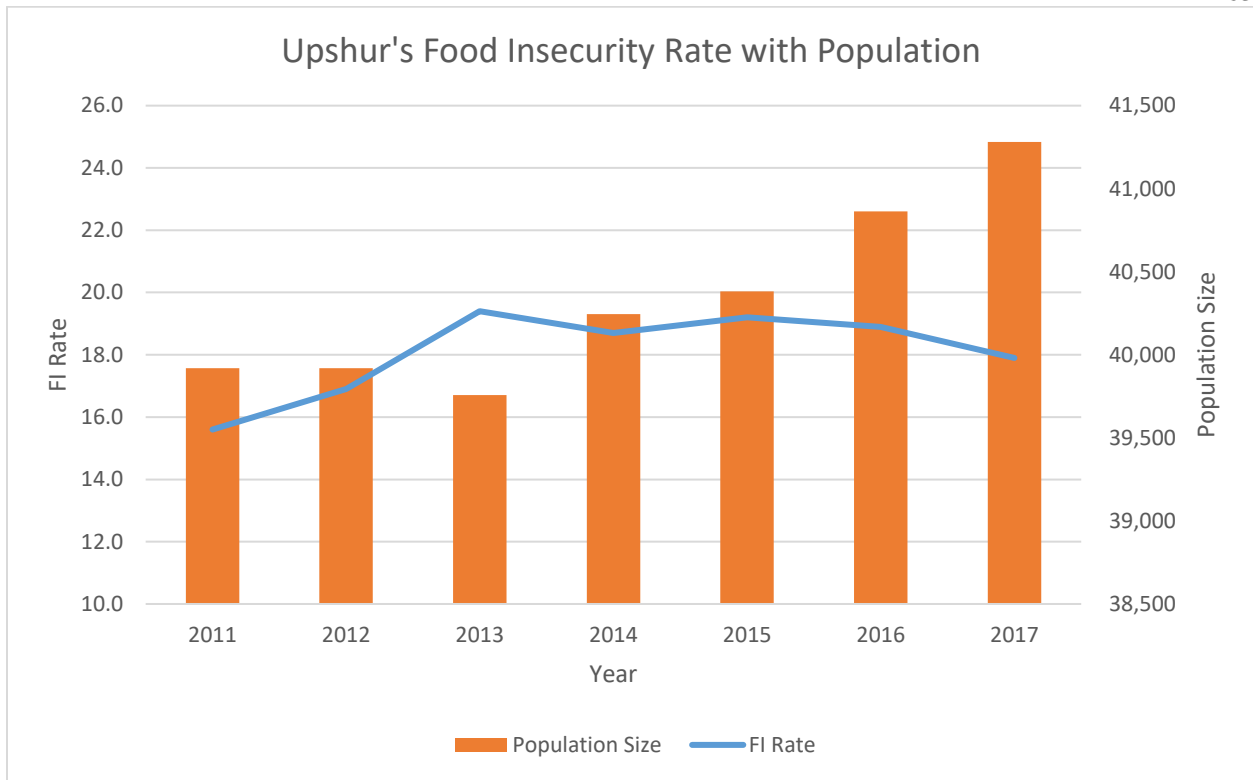


Figure 22: Food Security and Population Trend: Upshur County

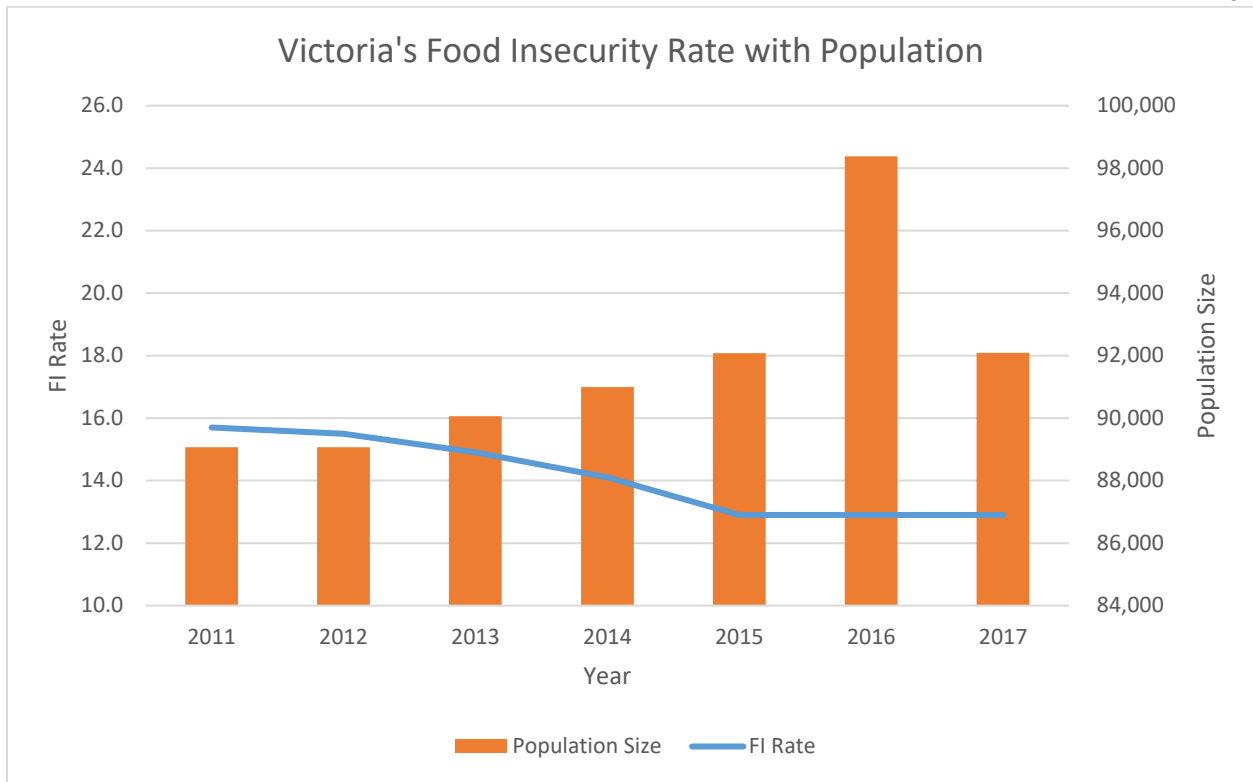


Figure 23: Food Security and Population Trend: Victoria County

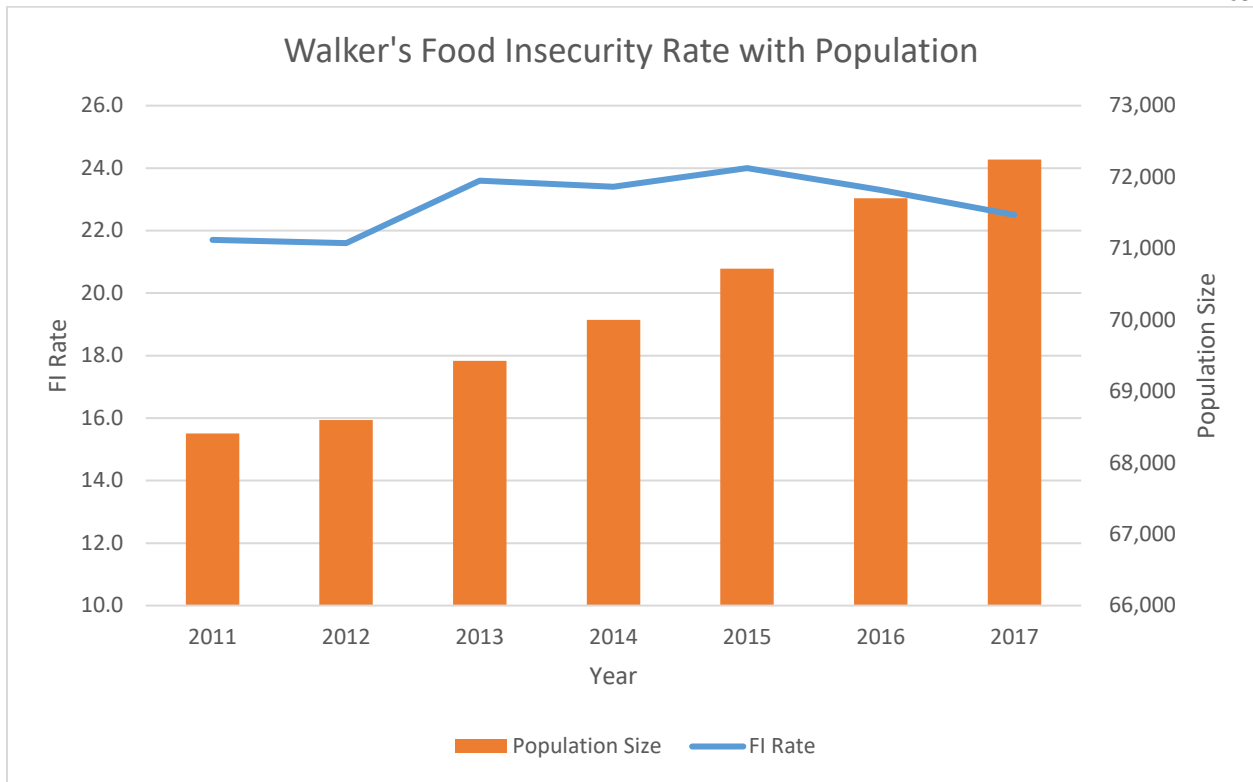


Figure 24: Food Security and Population Trend: Walker County

Correlational Analysis

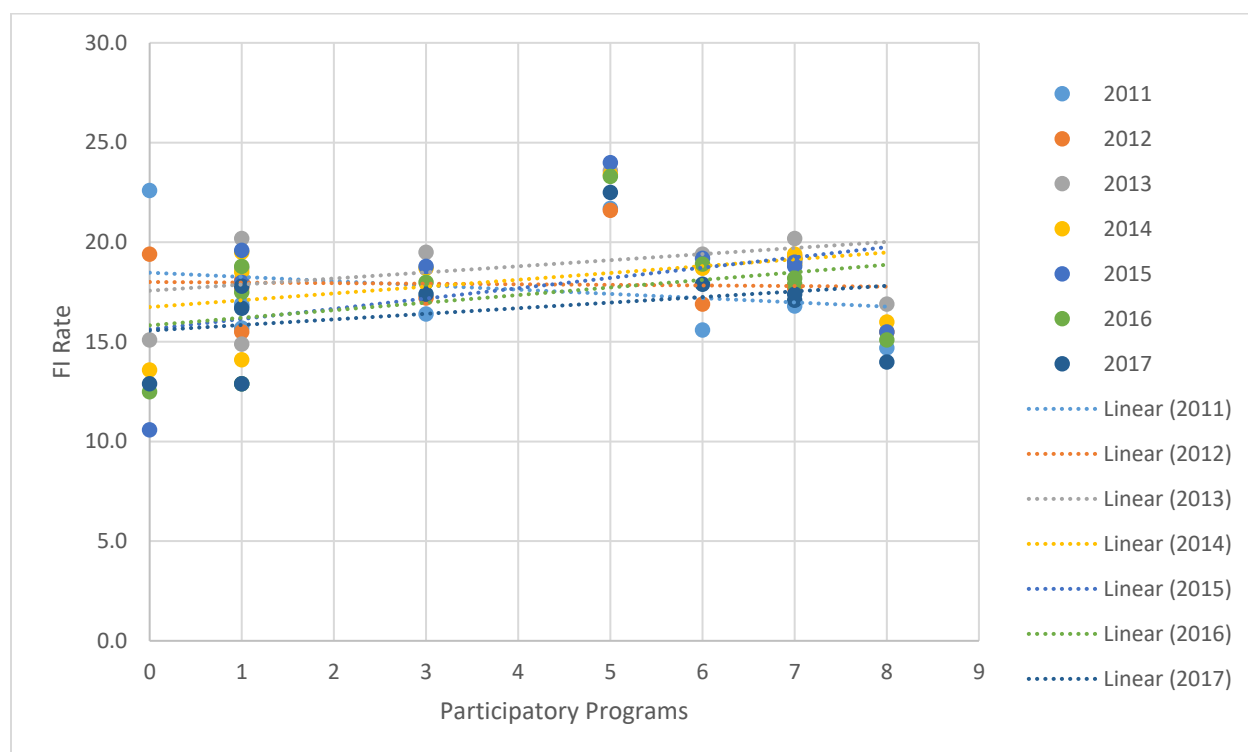


Figure 25: Aggregated Correlation Between Rates of Food Insecurity and Participatory Programming

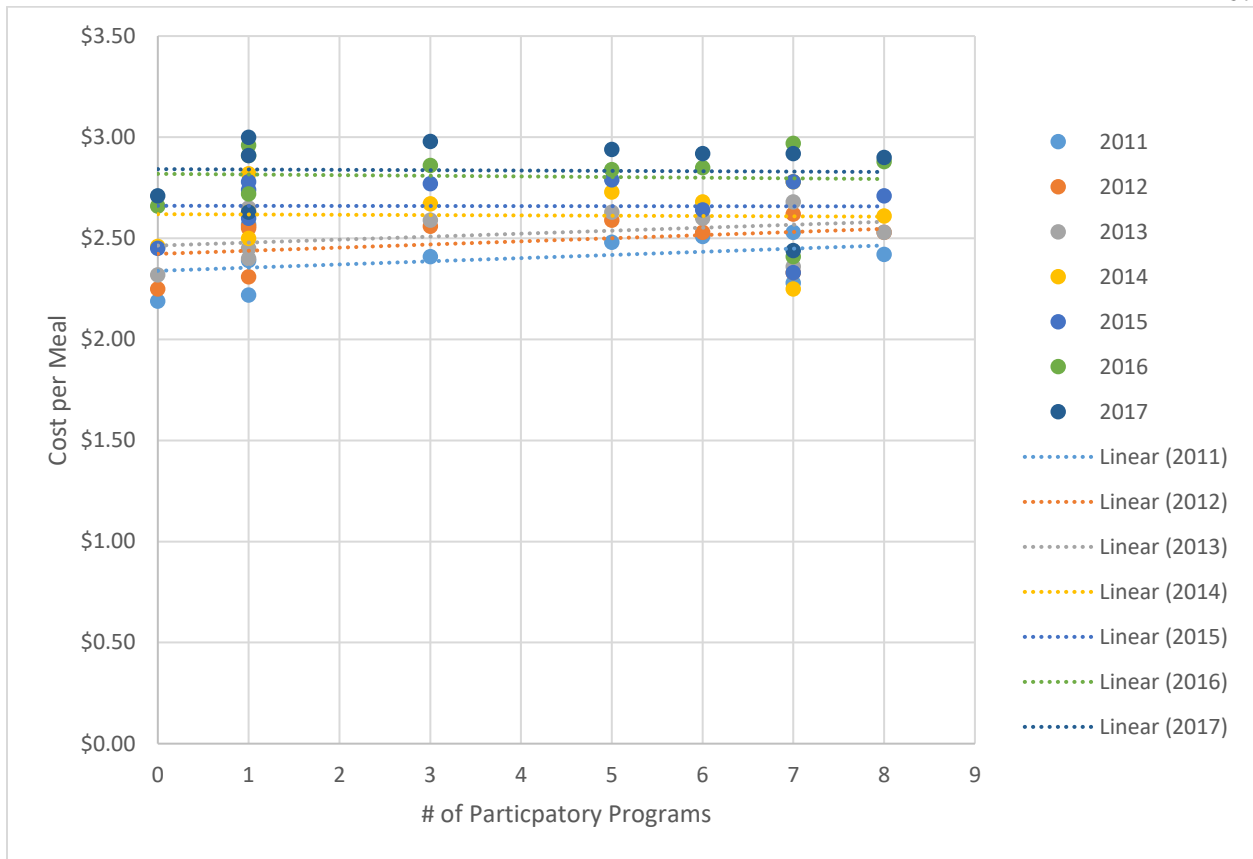


Figure 26: Aggregated Correlation Between Cost per Meal and Participatory Programming

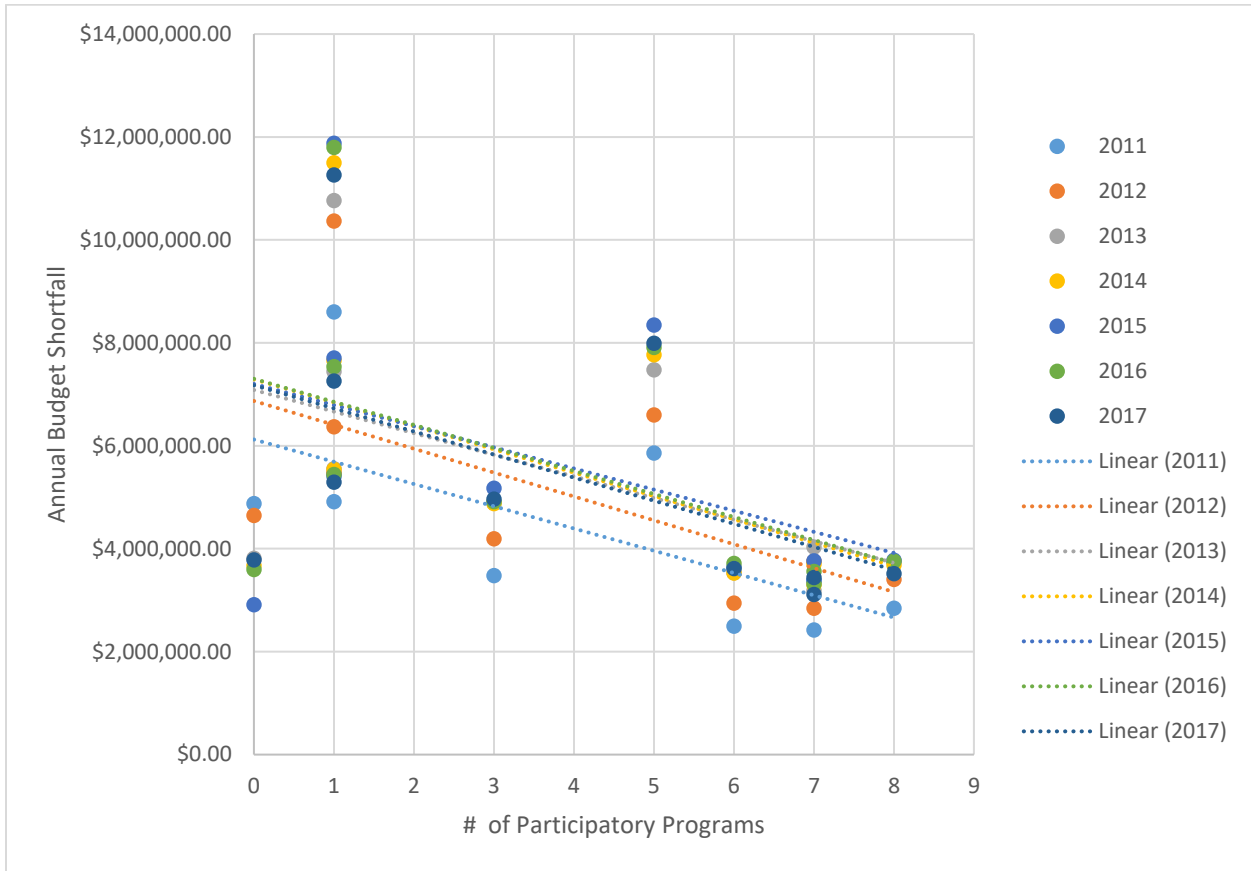


Figure 27: Aggregated Correlation Between Annual Budget Shortfall and Participatory Programming

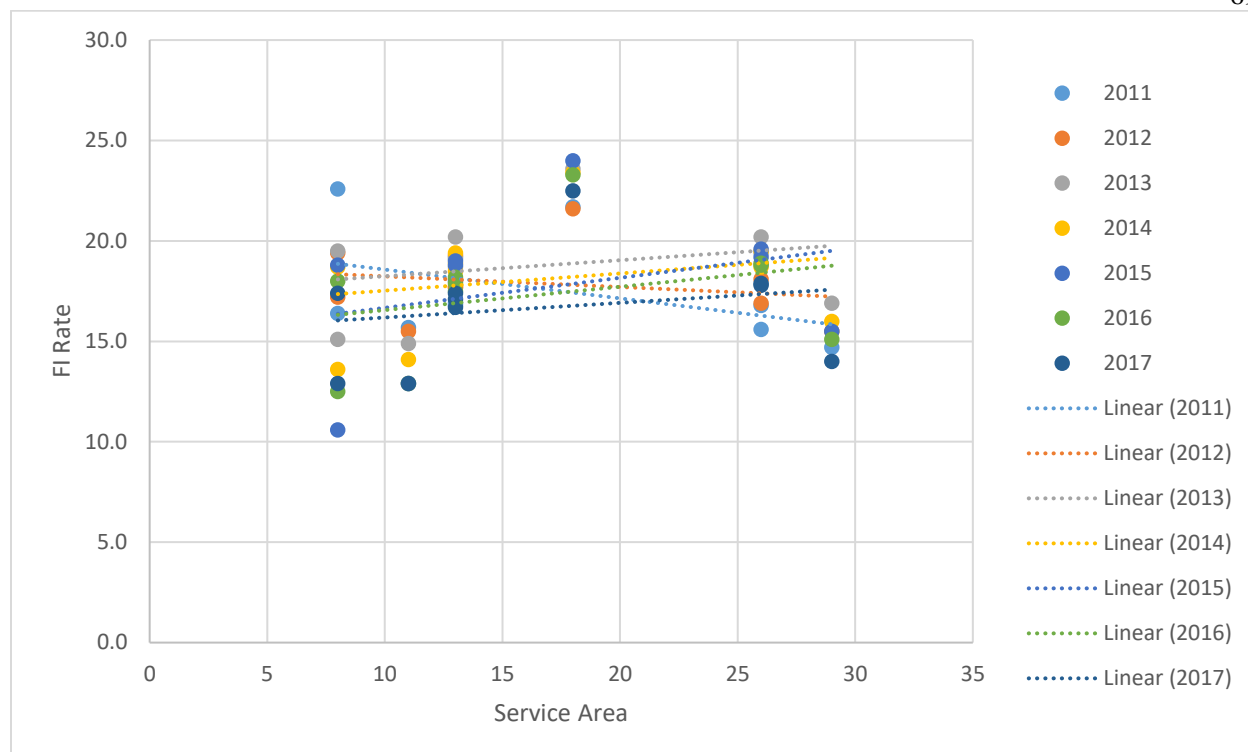


Figure 28: Aggregated Correlation Between Rates of Food Insecurity and Service Area

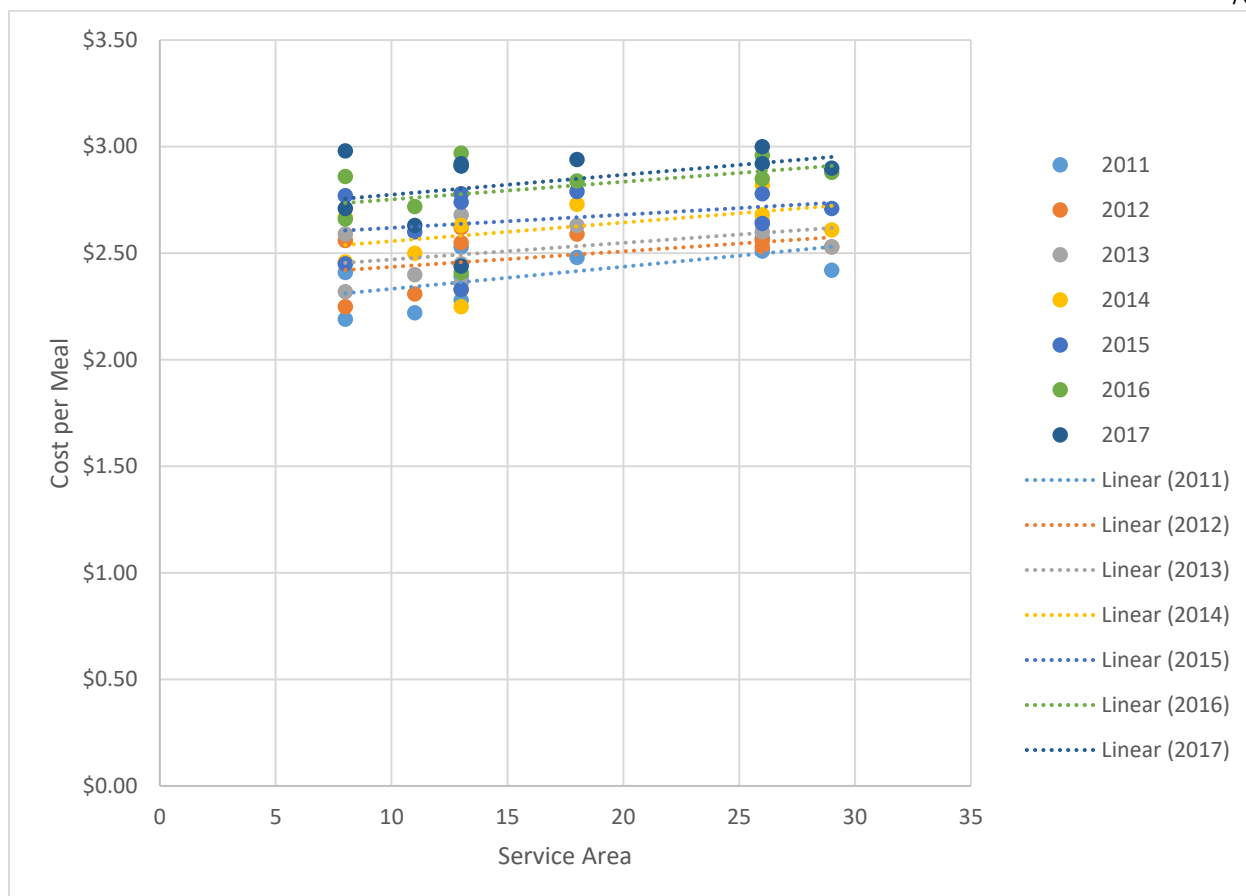


Figure 29: Aggregated Correlation Between Cost per Meal and Service Area

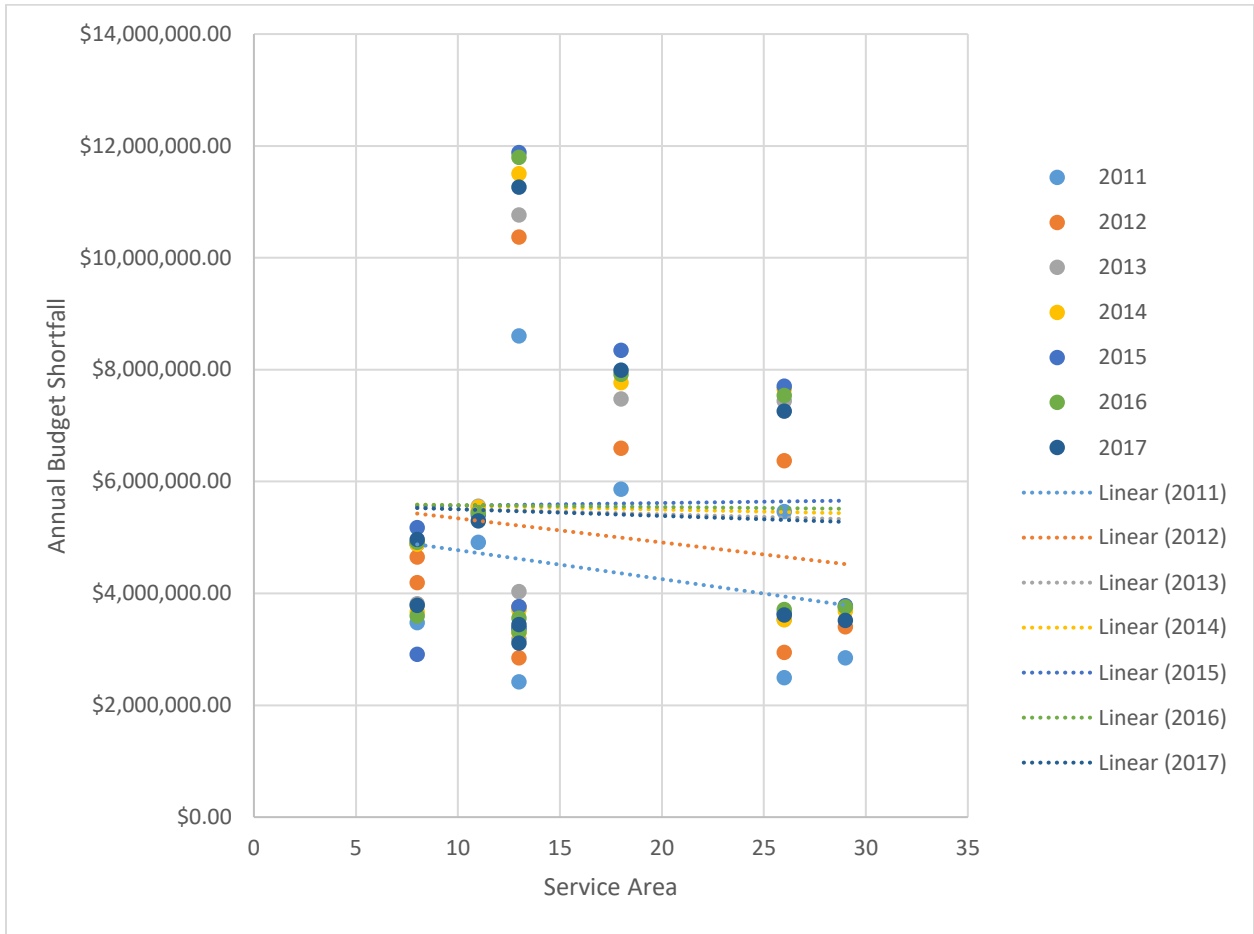


Figure 30: Aggregated Correlation Between Annual Budget Shortfall and Service Area

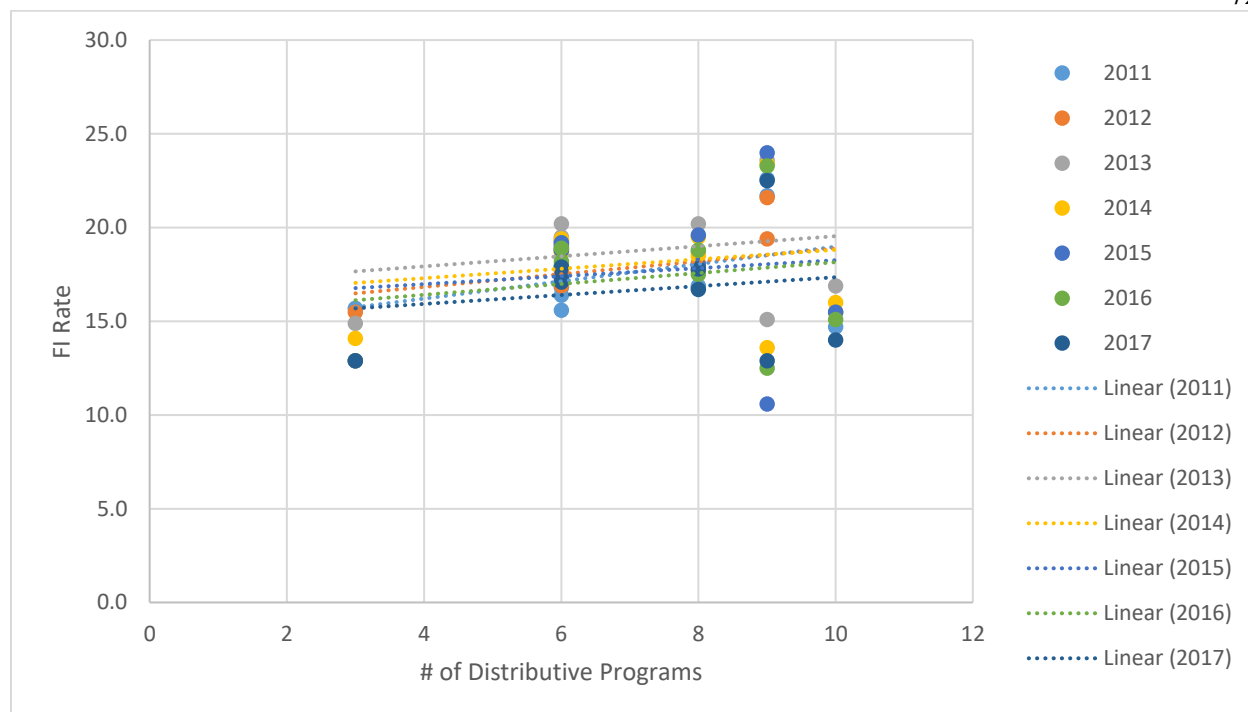


Figure 31: Aggregated Correlation Between Rates of Food Insecurity and Distributive Programming

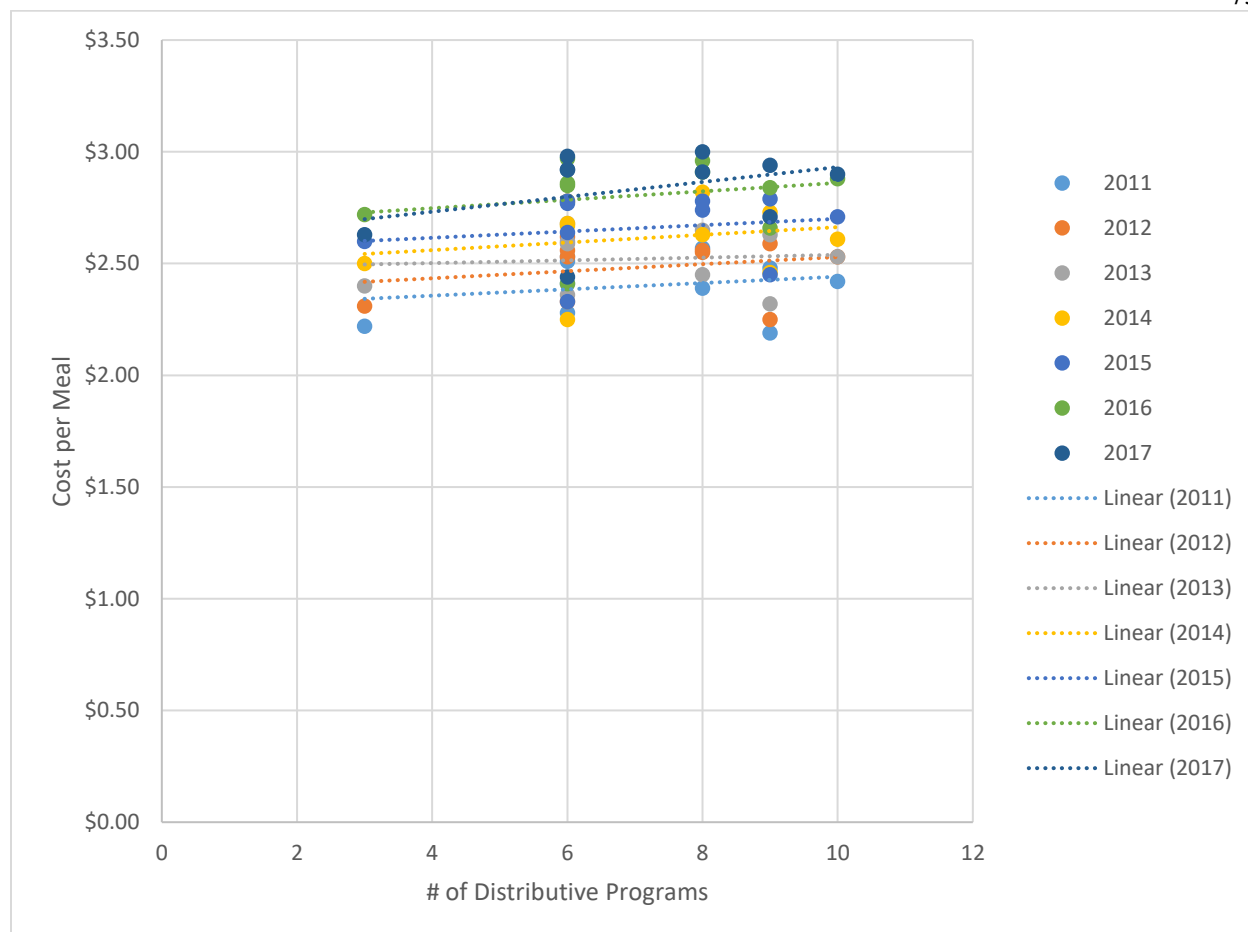


Figure 32: Aggregated Correlation Between Cost per Meal and Distributive Programming

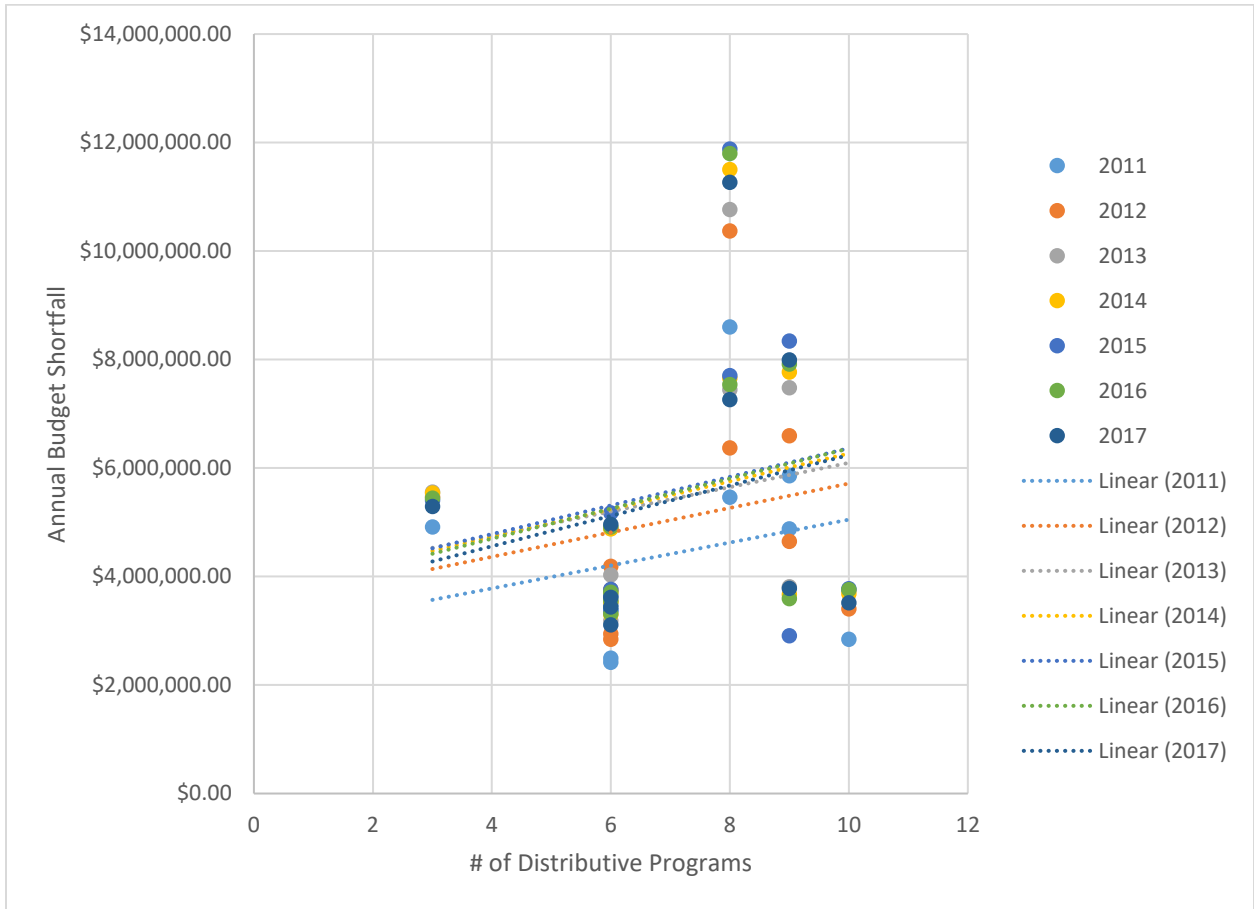


Figure 33: Aggregated Correlation Between Annual Budget Shortfall and Distributive Programming

Tables

Table 3: Variable and Aggregated Averages Across Texas Counties

County	Average FI	Average CPM	Average ABS
Hardin	18.00	\$ 2.69	\$ 4,643,161.43
Henderson	18.69	\$ 2.76	\$ 7,064,500.00
Hopkins	18.16	\$ 2.75	\$ 3,080,448.57
Kerr	15.39	\$ 2.65	\$ 3,534,211.43
Navarro	18.84	\$ 2.34	\$ 3,664,990.00
Starr	15.24	\$ 2.43	\$ 3,901,942.86
Taylor	17.71	\$ 2.65	\$ 10,884,735.71
Upshur	18.09	\$ 2.68	\$ 3,354,730.00
Victoria	14.13	\$ 2.48	\$ 5,376,984.29
Walker	22.87	\$ 2.71	\$ 7,423,781.43
Agg. Avg.	17.71	\$ 2.62	\$ 5,292,948.57

BIBLIOGRAPHY

- Alkon, A. & Mares, T. (2012). Food sovereignty in US food movements: radical visions and neoliberal constraints. *Agric Human Values*, 29, 347-359. DOI: <https://doi.org/10.1007/s10460-012-9356-z>
- Anderson, M.D. & Bellows, A.C. (2012). Introduction to symposium on food sovereignty: expanding the analysis and application. *Agric Hum Values* 29, 177–184. DOI: <https://doi.org/10.1007/s10460-012-9369-7>
- Bazerghi, C., McKay, F.H. & Dunn, M. The Role of Food Banks in Addressing Food Insecurity: A Systematic Review. *J Community Health* 41, 732–740 (2016). DOI: <https://doi.org/10.1007/s10900-015-0147-5>
- Block, D., Chavez, N., Allen, E. & Ramirez, D. (2012). Food sovereignty, urban food access, and food activism: contemplating the connections through examples from Chicago. *Agric Human Values*, 29, 203-215. DOI: 10.1007/s10460-011-9336-8
- Borras, A. & Mohamed, F. (2020). Health Inequities and the Shifting Paradigms of Food Security, Food Insecurity, and Food Sovereignty. *International Journal of Health Services*, 50(3), 299–313. <https://doi.org/10.1177/0020731420913184>
- Clendenning, J., Dressler, W., & Richards, C. (2016). Food justice or food sovereignty? Understanding the rise of urban food movements in the USA. *Agric Hum Values* 33, 165–177. DOI: <https://doi.org/10.1007/s10460-015-9625-8>
- Campbell, E., Ross, M. & Webb, K. (2013) Improving the Nutritional Quality of Emergency Food: A Study of Food Bank Organizational Culture, Capacity, and Practices, *Journal of Hunger & Environmental Nutrition*, 8:3, 261-280, DOI: 10.1080/19320248.2013.816991
- Cometti, M., Fredette, D., Panek, A. & Radley, M. (2019). From Markets to Tech: Governmental

- Initiatives, Solutions, and Responses to Food Insecurity. *Journal of Public Affairs*, 19(3), 1-11. DOI: <https://doi.org/10.1002/pa.1860>
- Dean, W. & Sharkey, J. (2011). Food insecurity, social capital and perceived personal disparity in a predominantly rural region of Texas: An individual-level analysis. *Journal of Social Science and Medicine*, 72:9, 1452-1462. DOI: <https://doi.org/10.1016/j.socscimed.2011.03.015>
- Fairbairn, M. (2012). Framing transformation: the counter-hegemonic potential of food sovereignty in the US context. *Journal of Agriculture and Human Values*, 29, 217-230. DOI:10.1007/s10460-011-9334-x
- Feeding America. (2020). *Map the Meal Gap 2020: Technical Appendix*. Feeding America. [Map the Meal Gap 2020 Technical Brief-Updated.pdf \(feedingamerica.org\)](#)
- Feeding Texas. (N.d.) *Hunger in Texas*. Feeding Texas. <http://www.feedingtexas.org/learn/hunger-in-texas/>
- Food & Agriculture Organization. (2017). *Global Strategic Framework for Food Security and Nutrition (GSF)*. Report prepared for Committee on World Food Security. Rome, Italy. Retrieved from <http://www.fao.org/3/a-mt648e.pdf>
- Gentilini, U. (2013), Banking on Food: The State of Food Banks in High-income Countries. IDS Working Papers, 2013: 1-18. DOI: <https://doi.org/10.1111/j.2040-0209.2013.00415.x>
- Golay, C. (2010). The Food Crisis and Food Security: Towards a New World Food Order. *International Development Policy, Revue internationale de politique de développement*. DOI: <https://doi.org/10.4000/poldev.145>
- Holt-Giménez, E. (2010). Food Security, Food Justice, or Food Sovereignty? *Food First: Institute for Food and Development Policy*, 16(4), 1-4.

- Murimi, M., Kanyi, M., Mupdudze, T., Mbogori, T. & Amin, R. (2016). Prevalence of Food Insecurity in Low-Income Neighborhoods in West Texas. *Journal of Nutrition Education and Behavior*, 48:9, 625-630. DOI: <https://doi.org/10.1016/j.jneb.2016.07.003>
- Murrell, A. & Jones, R. (2020). Measuring Food Insecurity Using the Food Abundance Index: Implications for Economic, Health and Social Well-Being. *International Journal of Environmental Research and Public Health*. 17(7):2434. <https://doi.org/10.3390/ijerph17072434>
- Passidomo, C. (2014). Whose right to (farm) the city? Race and food justice activism in post-Katrina New Orleans. *Agric Hum Values* 31, 385–396. DOI: <https://doi.org/10.1007/s10460-014-9490-x>
- Pothukuchi, K. (2004). Community Food Assessment: A First Step in Planning for Community Food Security. *Journal of Planning Education and Research*, 23(4), 356–377. <https://doi.org/10.1177/0739456X04264908>
- Shawki, N. (2012). The 2008 Food Crisis as a Critical Event for the Food Sovereignty and Food Justice Movements. *International Journal of Sociology of Agriculture & Food*, 19(3), 423-444.
- Texas Health and Human Services. (N.d.) *Texas Metropolitan Status by County*. The Department of Texas Health and Human Services. <https://dshs.texas.gov/chs/info/current-msa.shtm>
- Thomas, B. (2010). Food Deserts and the Sociology of Space: Distance to Food Retailers and Food Insecurity in an Urban American Neighborhood. *World Academy of Science, Engineering and Technology, Open Science Index* 43, *International Journal of Humanities and Social Sciences*, 4(7), 1545 - 1554. DOI: doi.org/10.5281/zenodo.1076064

The United Nations. (2011). *The Global Social Crisis: Report on the World Social Situation*

2011. *Department of Economic and Social Affairs*, 61-74.

<https://www.un.org/esa/socdev/rwss/docs/2011/chapter4.pdf>

U.S. Census Bureau. (2020). *Southern and Western Regions Experienced Rapid Growth This*

Decade. U.S. Census Bureau. [https://www.census.gov/newsroom/press-](https://www.census.gov/newsroom/press-releases/2020/south-west-fastest-growing.html)

[releases/2020/south-west-fastest-growing.html](https://www.census.gov/newsroom/press-releases/2020/south-west-fastest-growing.html)

Vitiello, D., Grisso, J., Whiteside, K.L. & Fischman, R. (2015). From commodity surplus to food

justice: food banks and local agriculture in the United States. *Agric Human Values*, 32,

419-430. DOI: 10.1007/s10460-014-9563-x

Webb, K. (2013) Introduction–Food Banks of the Future: Organizations Dedicated to

Improving Food Security *and* Protecting the Health of the People They Serve, *Journal of*

Hunger & Environmental Nutrition, 8:3, 257-260, DOI: [10.1080/19320248.2013.817169](https://doi.org/10.1080/19320248.2013.817169)

World Population Review. (2021). *Population of Counties in Texas (2021)*. World Population

Review <https://worldpopulationreview.com/us-counties/states/tx>

ACADEMIC VITA

NORMA GARCIA

normajeam1098@gmail.com

EDUCATION

BA Penn State University |Schreyer Honors College, Political Science **May 2021**
Dean's List (Spring 2018, Fall 2018, Spring 2019, Fall 2019, Spring 2020)

HS Churchill High School **June 2017**

HONORS AND AWARDS

Penn State Academic Grant	2020
J.W. Van Dyke Memorial Scholarship	2020
Gardner Family Open Door Honor Scholarship	2020
HSF Scholar	2019
Linda Brodsky Strumpf Trustee Scholarship	2019
Graham Open Door Honor Scholarship	2018
Veronesi-Iffert Open Doors Scholarship	2018
Eve Willard Jordan Trustee Award	2017
Campus 4yr Provost Award	2017
Chancellor's Award	2017
Academic Excellence Scholar	2017

WORK EXPERIENCE

Resident Assistant **Aug 2019-2020**

-Build community, plan and facilitate events, distribute university resources and information to students, support student transition and need, administratively file conduct reports, enforce policy in residence halls

Residential Dining - Student Employee **Oct 2018-2020**

-Crew Leading Position: support staff team throughout shift, delegate tasks to employees, track and log students administratively for tardiness, misconduct, warnings, or absence

LEADERSHIP EXPERIENCE

HSF Entrepreneurship Summit **Mar 2021**

-Selected as one of 100 attendees to participate in workshop sessions, group reflections, keynote, and guest speaker panels regarding the values and principles of entrepreneurship. The program featured

Schreyer Honors College- Scholar Ambassador **Aug 2019-2020**

-Run student tours and panels, provide information to prospective students & family, organize and develop philanthropic events including GivingTuesday campaign as a Philanthropy Co-chair

Gettysburg Leadership Experience **April 2019**

-Practice and apply critical thinking skills through a historical case study experience. Ambassadors and tour guides engaged participants by explaining the history and significance of the site while implementing critical thinking and leadership exercises based on historical events. A closing panel highlighted parallels between leadership of the past and decision-making today

Presidential Leadership Academy- Member **April 2018-2020**

-Develop critical thinking skills, discuss leadership practices, attend networking events and excursions, explore gray area, and reflect through blogging

COMMUNITY SERVICE AND ENGAGEMENT

Latinx Women Association- Member **2020**

-Attend meetings, discuss and bring awareness to current events impacting minority groups along lines of gender, race, region, sexual orientation, etc., participate in events and fundraising for students

Salt Company Ministry-Member **Aug 2018-2020**

-Attend service, fellowship through connection groups, participate in community events, attend network conferences, mentor and support peers through discipleship

Mexican-American Student Association- Member **Aug 2018-2019**

-Attend events, participate in fundraising and community events, discuss culture and diversity

Springfield THON Organization- Member **Aug 2017-2018**

-Attended events and meetings, participate in fundraising activities and THON in support of pediatric cancer

SA Food Bank **2017-2019**

-Donate, organize, and load food donations to feed the local community

My Backyard Project **2017**

-Participate in organized activities such as maintaining landscape within the Schreyer/Penn State community

REFERENCES

(Available upon request)