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FOOD JUSTICE:
An Empirical Analysis of Food Landscapes and Population Health in a Large U.S. City

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ABSTRACT

This study examines the challenge of "food justice" by investigating the relationships between food landscapes and the health and wellbeing of local communities in a large urban setting. We identify and discuss the implications of these relationships for advancing the U.N. Sustainable Development Goals of ending hunger, improving health and wellness for all, and promoting sustainable agriculture. Empirical results show that controlling for several health-related variables, rates of obesity in a community coincide with the incidence of food outlets with no or low produce available. That is, urban neighborhoods with higher numbers of stores selling mostly unhealthy food options and little or no fresh fruits and vegetables are characterized by higher rates of obesity. Lack of access to healthy foods is a symptom of food injustice. Implications for social entrepreneurs, business and government leaders, and public health professionals are discussed along with ways to address the pervasive global challenge of food injustice.

KEYWORDS

food justice; empirical analysis; food landscapes; public health; sustainable agriculture; Sustainable Development Goals

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INTRODUCTION

The Sustainable Development Goals (SDGs), established in 2015 by the United Nations General Assembly, are a collection of 17 interrelated global goals designed to be a "blueprint to achieve a better and more sustainable future for all." They are a call to action based on the recognition that "ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth" while doing so in an environmentally sustainable way (United Nations, n.d.).

This study addresses Goal 2 of the SDGs, *Zero Hunger*, and Goal 3, *Good Health and Well-Being*, by examining food landscapes and health outcomes in a large city in the United States. Goal 2 focuses on ending hunger, achieving food security, improving nutrition, and promoting sustainable agriculture. Goal 3 promotes health and wellness for all.

Philadelphia was chosen as the setting for this study as it is the "poorest" of the large cities in the United States with 23.3 percent of residents living in poverty, surpassing Houston as the next largest poor U.S. city with a poverty rate of 20.4 percent (U.S. Census Bureau, 2022). The purpose of this study is to investigate the relationships between food landscapes and the health and wellbeing of local communities in a large urban setting, and to consider the implications of these relationships for addressing nutrition, sustainable agriculture (Goal 2 of the SDGs), health and wellness (Goal 3), and the global challenge of food justice. While Philadelphia is the setting for this study, it is important to note that the problems of hunger, food insecurity, and food injustice are prevalent and persistent in many large cities throughout the United States and globally.

LITERATURE REVIEW

The Food Justice movement is closely intertwined with environmental justice and sustainability (Boston University Community Center, n.d). Gottlieb and Joshi (2010, p.7) define food justice as "ensuring that the benefits and risks of what, where, and how food is grown and produced, transported and distributed, and accessed and eaten are shared fairly;" and frame their book in the context of "the increasing disconnect between food and culture that has resulted from our highly industrialized food system." The Brooklyn Food Coalition (n.d.) identifies three

pillars of food justice: (1) access to healthy and nutritious food for all, (2) sustainable food systems, and (3) justice for food workers. These pillars promote the importance of a global food system that is equitable and sustainable for all of its stakeholders, i.e., the consumers, the environment, and the workers that produce, process, and transport the food.

The food justice movement seeks to transform the global food system in which "farm workers face difficult and hazardous conditions, low-income neighborhoods lack supermarkets but abound in fast-food restaurants and liquor stores, food products emphasize convenience rather than wholesomeness, and the international reach of American fast-food franchises has been a major contributor to an epidemic of 'globesity'" (Gottlieb & Joshi, 2010, summary). The World Health Organization (n.d.) coined the term "globesity" to describe the public health crisis of obesity affecting a growing percentage of the global population.

Access to healthy and nutritious foods is the first pillar of food justice. In the United States, the setting for this study, the Department of Health and Human Services (HHS) and the Department of Agriculture (USDA) jointly published a report containing nutritional and dietary guidelines for the American public. Required under the 1990 National Nutrition Monitoring and Related Research Act (Public Law 101-445, 7 U.S.C. 5341 et seq.), the *Dietary Guidelines for Americans* must be based on the preponderance of prevailing scientific and medical knowledge. According to the *Guidelines* (USDA, 2020), one of the "key recommendations" of a healthy diet is a "variety of vegetables from all of the subgroups—dark green, red and orange, legumes (beans and peas), starchy, and other" as well as "fruits, especially whole fruits."

This emphasis on consumption of quality, fresh fruits and vegetables is unsurprising as it has been a point of emphasis in the *Guidelines* for many years. More broadly, the *Guidelines* have emphasized the relationship between poor diet and a variety of health problems, including obesity, diabetes, hypertension, certain types of cancer, and cardiovascular disease. Access to fresh produce, in particular, has been identified as a factor in family health and community food insecurity. Studies have shown that inadequate consumption of fruits and vegetables is a risk factor for many diseases, and a diet low in fruit was found to be the fifth greatest risk factor for disability and disease (Pearson et al., 2014). According to the National Institutes of Health (NIH), obesity and overweight together are a leading cause of

preventable death in the United States, close behind smoking (NIH, 2020). The Department of Health and Human Resources estimated that 300,000 deaths per year are due to health conditions linked to obesity (West Virginia Department of Health & Human Resources, n.d.). Poor diet and especially the overeating of energy-dense processed foods such as salty snack foods, cookies, candy, and sweets coupled with inactivity are linked to obesity. Fruits and vegetables, on the other hand, are nutrient-dense foods, and an essential component of a healthy diet.

As emphasized by the food justice movement, however, not everyone has access to quality produce. Access may depend on where one lives and one's community food landscape. Prior research has focused on access to supermarkets and its potential impact on diet. For example, Rose and Richards (2004) found that access to supermarkets was positively related to fruit consumption among participants in the U.S. Food Stamp Program, now known as SNAP (the Supplemental Nutrition Assistance Program). Laraia, Siega-Riz, Kaufman, and Jones (2004) found a positive correlation between proximity to supermarkets and quality of diet among pregnant women. Galvez et al. (2008) found that supermarkets had two times the amount of low-fat and low-sodium foods than neighborhood grocery stores, and four times the number of these foods than convenience stores. Morland, Wing, and Roux (2002) reported a 32% increase in fruit and vegetable consumption among African-American residents per additional supermarket in their census tract.

Other studies, however, have failed to find any significant relationship between proximity to grocery stores and consumption of healthy foods. For example, Gase, DeFosset, Smith, and Kuo (2014, p. 3) found no such relationships in low-income neighborhoods in Los Angeles County: "neither distance nor time to the nearest grocery store was significantly associated with fruit and vegetable intake." Likewise, Gustafson, Christian, Lewis, Moore, and Jilcott (2013) found no association between food venue availability and fruit and vegetable intake in a study conducted in Lexington, Kentucky.

These mixed results may be due to differences in how food environments were measured in these studies. Some of the studies focused on supermarket access only, rather than assessing the entire array of food store types available in the study area which is the approach taken in this study.

Another factor found to be relevant in studies of diet and produce consumption is household income. Lower socioeconomic status households have been shown to purchase smaller volumes of fruits and vegetables compared to higher socioeconomic status households (Pearson et al., 2014). The U.S. Department of Labor reports that low-income households are less likely than others to spend food dollars on “healthy” foods like fresh fruit, but more likely to buy "filling foods" such as rice and bread, and "unhealthy foods" including hot dogs and oils (Alwitt & Donley, 1996). Price is the dominant reason for this, as evidence suggests that reducing the price of healthy food increases its purchase and consumption (Pearson et al., 2014).

A survey of 325 food retail outlets in Glasgow, Scotland found that store format was the best predictor of the price and availability of an assortment of foods "comprising a modest but adequate diet.” That same study found that discount supermarkets and competitive supermarkets offered the lowest prices, while small independent grocers were the most expensive (Cummins & Macintyre, 2002, p. 2115). Low-income neighborhoods in Glasgow with low access to supermarkets but a high volume of independent grocery stores paid higher prices for their produce, leading residents to purchase cheaper but less healthy options. This is an example of food injustice. This study did not, however, investigate relationships between food environments and measures of community health such as obesity rates.

All these factors—accessibility, availability, and product mix—impact a community and its food landscape. Prior studies have examined some of these factors in isolation but have not considered all of them in combination. This study takes a comprehensive look at the factors that define a community’s food landscape and its access to healthy and nutritious foods. In addition, this study takes the further step of assessing the relationships between a community’s food landscape and its rates of obesity, a key measure of population health and food justice. This study is further differentiated from previous studies by its focus on the neighborhood as the unit of analysis rather than on the individual or the household. Please see Figure 1 for a graphical representation of the variables investigated.

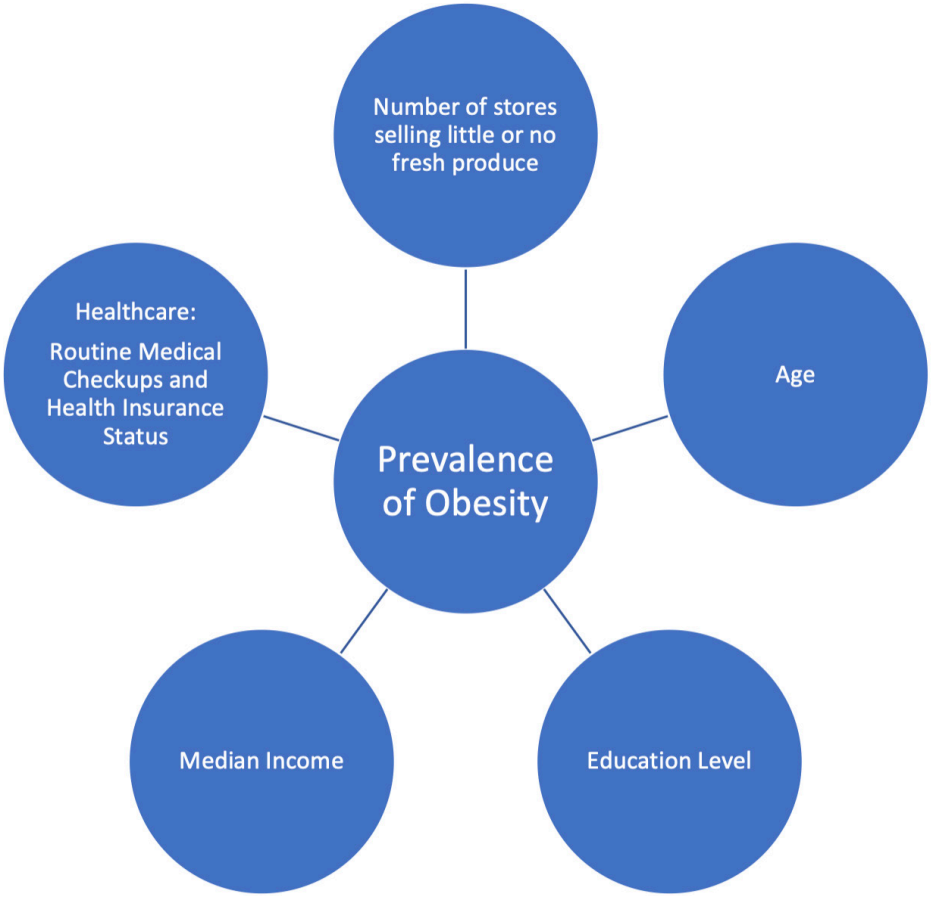

Figure 1: Graphical Representation of the Variables Investigated

RESEARCH METHODS AND HYPOTHESES

To better understand food justice and access to healthy foods, this study examines the relationships between food landscapes and obesity rates in 46 neighborhoods in the city of Philadelphia, the sixth largest city in the country and the city with the highest rate of poverty. We used two datasets to study these relationships. First, we used the publicly available dataset compiled by the Department of Public Health of the City of Philadelphia consisting of public health data by neighborhood for the 46 neighborhoods defined in this study. The Philadelphia Department of Public Health collects volumes of data on community health by neighborhood each year

and publishes its findings in an annual report called *Close to Home: The Health of Philadelphia's Neighborhoods Report, 2019* (Philadelphia Department of Public Health and Drexel University Urban Health Collaborative, 2019). This report is a systematic assessment of population health in Philadelphia, highlighting key public health challenges and assets and informing local public health programs, policies, and partnerships. The report includes a wealth of data reflecting health behaviors and conditions in the city, including tobacco and alcohol use, obesity rates, cardiovascular disease, diabetes and much more. This data is reported by neighborhood for each of the 46 neighborhoods in the city.

The boundaries of the neighborhoods are defined to coincide with Philadelphia's 46 neighborhoods as determined by the Philadelphia Department of Public Health. To create neighborhoods, census tracts were grouped together based on boundaries created for the Southeast Pennsylvania Household Health Survey. Special land-use tracts with little or no residential population and special characteristics such as large parks or employment areas were not assigned to neighborhoods (Philadelphia Department of Public Health and Drexel University Urban Health Collaborative, 2019).

We created the second dataset used in the study by identifying each retailer selling food within the 46 neighborhoods and determining whether or not the store sells fresh fruit and vegetables. This process was completed in late 2020 into the first half of 2021. The retail food store mix and density of each neighborhood was identified by using mapping resources: Google Maps, Google Earth, and Apple Maps. This database identifies the name, address, and type of every food store outlet within each of the 46 neighborhoods in the city. The types of stores are classified as follows: chain supermarket, discount supermarket, independent grocery store, chain convenience store, chain drug store, independent drug store, dollar store, and gas station. Specialty food stores, such as delis, produce markets, farmer's markets, butchers, and fish markets, were typically independent groceries and classified as such. See Table 1 for examples of each type of store.

Each store was further identified as either "high produce," meaning they carried an assortment of fresh fruits and vegetables, or "low produce," meaning they carried mostly unhealthy food choices, like sugary beverages and salty snacks, with either

no produce or very limited produce. Produce availability is emphasized given its accepted role in a healthy diet and clear definition.

By definition, some categories such as supermarkets and farmer's markets were high produce venues. Others, such as gas stations, dollar stores, and drug stores were low produce outlets. The availability of produce in all other stores was determined by a website search or, if necessary, a phone call to the store. The type of store did not always determine the availability of healthy foods. For example, most independent grocery stores were low produce stores but some, such as Lang's Fruit & Produce and Clark Park Farmers' Market, for example, were classified as high produce. Using this approach, the dataset includes 2,037 stores in 46 neighborhoods. Of those 2,037 stores, 89.1% (1,815 stores) are low produce stores.

Type	Examples
Chain convenience store	Wawa, 7-Eleven, Royal Farms
Chain drug store	CVS, Rite Aid, Walgreens
Chain supermarket or Supercenter	Kroger, HEB, Acme, Giant, Whole Foods, Trader Joe's, Target, Wal-Mart
Discount supermarket	Aldi, Save A Lot
Dollar store	Dollar Tree, Dollar General, Family Dollar
Gas station	Sunoco, LUKOIL, Exxon
Independent groceries & Specialty stores	corner grocers, bodegas, farmers' markets, fish stores (generic categories)
Independent drug store	Community pharmacies (generic category), Mt. Airy Family Pharmacy

Table 1: Store Types & Examples

Conventional wisdom once held that obesity rates were inversely related to income levels; that is, poverty was believed to be linked to high rates of obesity. In the United States, the preponderance of evidence no longer supports the claim,

perhaps because rates of obesity over time have increased and converged across all income levels. Recent studies by the Center for Disease Control and Prevention (Ogden et al., 2017) describe a complex and nuanced relationship between income and obesity.

For this study, the prevalence of obesity within a neighborhood is hypothesized to be positively associated with the number of retailers selling snack foods but little or no produce. In other words, obesity rates are expected to be higher in food landscapes categorized by large numbers of stores selling energy-dense processed foods, snack foods, and foods with low nutritional value, but little or no fresh fruits and vegetables.

The following variables were used as controls: population size of the neighborhood, neighborhood median income, neighborhood median age, percent of uninsured, percent who have gone for routine medical checkups, and percent who have completed at least some college.

Regarding population size, one can surmise more food stores are likely to be located in larger neighborhoods, reflecting the larger customer base. We predicted a positive correlation between being uninsured and rates of obesity reflecting the expectation that those who receive regular medical attention are less likely to be obese. Similarly, we predicted a negative correlation between going to routine medical checkups and obesity rates (this was not supported, however). The remaining control variables were chosen based on previous correlations that have been shown in the literature. For example, obesity is positively correlated with age (Jura & Kozak, 2016; Sakurai et al., 2010). Finally, higher levels of education have been associated with lower likelihoods of obesity (Devaux, Sassi, Church, Cecchini, & Borgonovi, 2011).

RESULTS

The food justice movement raises awareness about the inequities of food systems and food landscapes. This study empirically tests whether such inequities exist. We first conducted a linear regression to understand whether the number of stores with low or no fruits and vegetables affected the obesity rate of the neighborhood. A variety of population and health variables were used as covariates in the regression

function after screening for multicollinearity using a correlation of >.80 as a criterion. Hence, not all variables in the merged dataset were used. The results of the regression analyses are shown in Table 2.

	Unstandardized Coefficients		Standardized Coefficients (normalized and unit-less)	t		Sig.
	B	Std. Error	Beta			
(Constant)	-8.659	7.431		-1.165		0.251
Population Size	< 0.001	< 0.001	-0.15	-2.916		0.006
Median income	< 0.001	< 0.001	-0.336	-3.493		0.001
Median Age	-0.448	0.106	-0.294	-4.223		< 0.001
Uninsured	-0.084	0.122	-0.047	-0.689		0.495
Routine Medical Check Up	0.988	0.118	0.578	8.366		< 0.001
Completed Some College	-0.12	0.043	-0.276	-2.803		0.008
Number of low produce stores	0.075	0.022	0.238	3.48		0.001

Table 2: Regression Output for Obesity % as Dependent Variable

Holding all else constant, there was a positive relationship between the number of low produce stores and obesity rates ($t(38) = 3.48$, $p = .001$). In particular, this relationship holds while controlling for variables such as population size of the neighborhood, neighborhood median income, neighborhood median age, percent of uninsured, percent who have gone for routine medical checkups, and percent who have completed at least some college. This suggests that the absolute number of low produce stores in a neighborhood is predictive of obesity percentage. More specifically, results indicate that obesity rates within a neighborhood increase as the number of stores in the neighborhood selling unhealthy foods with little or no fresh

fruits and vegetables increases. When food landscapes are dominated by unhealthy food options, food injustice prevails.

Looking more broadly at the covariates, a variety of other variables, as predicted, were significant predictors of obesity rate. In particular, population size, median income, median age, percent that have gone for a routine medical checkup, as well as completion of some college were also all significant predictors of obesity rate. The direction of those significant relationships is as predicted with one exception. Results indicate, as expected, that neighborhoods that are relatively more educated, wealthier, and younger are characterized by lower obesity rates. No significant relationship exists between rates of uninsured and obesity. One unexpected finding is the positive relationship between routine medical check-ups and obesity. This suggests that obesity rates are higher in neighborhoods where people are more likely to get a routine check-up all else being equal. Perhaps this suggests that people who are obese are more likely to see their doctor on a regular basis to monitor their obesity. Since we are not testing causality, this is a plausible explanation, but we have no way to verify that interpretation. This is a similar issue across all variables as causality cannot be inferred using regression analysis.

DISCUSSION

Stoner (2015, p. v) notes that "the way we currently produce, distribute, and consume simply cannot continue, and even if it could continue, it is tragically unjust and should be altered. The current system works obscenely well for very few, moderately well for a considerable number, and not well at all for a much larger number." Stoner's critique focuses on the global economic system, but the same point can be made about the global food system. We are not on track to achieve the U.N. Sustainable Development Goal to end world hunger by 2030. Indeed, global hunger has been on the rise during the pandemic (Reid, 2020). And in many large cities around the world, junk food is ubiquitous but access to healthy, nutritious foods is limited.

Consistent with these concerns and those expressed by the food justice movement, the results of this study suggest that urban neighborhoods with a large number of stores that supply processed foods and snacks but little or no produce have a significant effect on neighborhood rates of obesity. Since prior research

has suggested that income, education, and age are correlated with higher obesity rates (Devaux et al., 2011; Jura & Kozak, 2016; Ogden et al., 2017; Sakurai et al., 2010), our regression control variables help account for these effects in Philadelphia neighborhoods.

These results suggest an important relationship between food landscapes at the local level and community health. People living in neighborhoods dense with stores selling food that is high in calories but low in nutritional value (i.e., junk food) are more likely to be obese and, therefore, suffer the poor health consequences that go along with obesity. This is an issue of food justice.

The World Health Organization (n.d.) calls obesity an "escalating global epidemic" and a global health crisis. We know that obesity is a multifaceted health outcome; obesity has a genetic component and health behaviors such as one's level of physical activity and exercise are linked to obesity. This study, however, shows a clear link between where one lives and obesity rates. Context matters. Obesity rates in the neighborhoods of Philadelphia vary widely. For example, those living in the Strawberry Mansion section of Philadelphia are more than twice as likely to be obese (44.8%) as those living just a few miles away in the Center City neighborhood (19.9%) (Philadelphia Department of Public Health and Drexel University Urban Health Collaborative, 2019).

This study demonstrates the link between unhealthy food environments and high rates of obesity. Across Philadelphia, neighborhoods with higher numbers of stores selling snack foods and foods that are high in calories from sugar or fat and little or no fruits and vegetables are characterized by higher rates of obesity regardless of income, education level, or age.

IMPLICATIONS AND CONCLUSION

Food landscapes influence health behaviors and help to explain poor health outcomes. This is an issue of food justice. These findings have implications for social entrepreneurs, business leaders, government agencies, nonprofits, and public health professionals. Each of these stakeholders can play a role in addressing food injustice, particularly in low-income neighborhoods, by improving access to healthy foods such as fresh fruits and vegetables and reducing the over-supply of unhealthy

products, particularly junk food. Furthermore, they can achieve these aims while also conserving natural resources and reducing the environmental impact of agriculture.

From the perspective of business leaders and social entrepreneurs, "vertical farming" is a growing business opportunity that addresses the challenge of food justice, and that supports people, profit, and the planet. A vertical farm is located in a dense urban area and typically makes use of an abandoned factory or warehouse, converting it into a space for growing, typically through vertically stacked growing containers. Resource consumption is radically reduced by recycling water and nutrients using technologies that are now readily available on the market. The vertical farms serve local markets with local produce thereby further reducing resource consumption due to shipping, storage, and logistics expenses. For example, Vertical Harvest Philly, announced in February 2021, will enhance "community access to exceptional farm fresh foods year-round using less land, water and fuel… It is estimated this vertical farm will produce one million pounds of produce per year. In addition to wholesale partnerships with hospitals, corporate cafeterias, schools, chefs, restaurants, caterers and more, the location will also have a consumer marketplace" (Vertical Harvest, 2021, p. 1). Vertical farming is one way that social entrepreneurs and business leaders can supply much needed fresh produce to local urban markets in a more environmentally responsible and sustainable way.

Community gardens are another way to address the challenge of food injustice in urban settings. The USDA (n.d.) defines community gardens as "plots of land, usually in urban areas, that are rented by individuals or groups for private gardens" for the benefit of the people caring for the garden and the local community. Government agencies, nonprofits, and public health professionals can be partners in supporting and promoting community gardens. For example, in Philadelphia, the Urban Tree Connection (UTC), a 501(c)(3) nonprofit organization, works to build a community-based food system "through gardening projects on vacant land. [Their] aim is to cultivate community leadership, to improve community health and to develop a local, sustainable, and equitable food system." UTC has worked with community partners to redevelop "29 vacant lots, totaling more than 86,000 square feet of land for communal growing and gathering, sustainable (chemical free) food production and distribution, and multigenerational health and wellness education... UTC has been at the forefront of urban farming and land reclamation movements

in Philadelphia, helping pioneer key tools for legal reclamation of abandoned properties" (Urban Tree Connection, n.d., About Us page).

The Black Church Food Security Network, established in 2015 in Baltimore, Maryland provides technical and financial support and advocacy for urban farms and gardens in partnership with their local community by helping "Black churches use their assets to establish gardens on their land, host miniature farmer's markets and buy wholesale from Black farmers" (Black Church Food Security, n.d. About Us page). The Network is an association of congregations, farmers, food advocates, and community activists working together to create an alternative food system in the Baltimore metropolitan area. They prioritize bringing support to communities struggling with food insecurity and promote food justice and sovereignty to empower Black communities. They establish pipelines for fresh produce between Baltimore area congregations and Black farmers. The Network has expanded beyond Baltimore to form partnerships with congregations and farmers in Tennessee, Georgia, North Carolina, Virginia, and Ohio.

Government is also a stakeholder in addressing food injustice, particularly during a pandemic when food insecurity and hunger increase. At the federal level, the U.S. Department of Agriculture (USDA) initiated the "Farmers to Families Food Box" program as part of the Coronavirus Food Assistance Program. Since May of 2020, shortly after the COVID-19 lockdown, USDA contractors have delivered more than 100 million boxes of fresh produce, milk, dairy, and meat products to disadvantaged citizens across the country. Local distributors "package these products into family-sized boxes, then transport them to food banks, community and faith-based organizations, and other non-profits serving Americans in need" (USDA, 2021). While this is considered an emergency program in response to the pandemic, its long-term feasibility should be considered to address intractable problems of food injustice.

The Food Trust is an example of a nonprofit that partners with government agencies and businesses to support food justice. The Food Trust's mission is "to ensure that everyone has access to affordable, nutritious food and information to make healthy decisions. Working with neighborhoods, schools, grocers, farmers and policymakers, we've developed a comprehensive approach to improved food access that combines nutrition education and greater availability of affordable,

healthy food" (The Food Trust, n.d. Our Mission page). Among several initiatives, this nonprofit supports farmer's markets in the city and partners with corner store owners to increase access to healthy food products.

Another example of a government partnership, this one at the local and state levels, is the "Healthy Corner Store Initiative." This is a Food Trust program that works to increase the availability and awareness of healthy foods in corner stores in Philadelphia through training programs and technical assistance for corner store owners, and through consumer nutrition education and marketing messages to encourage healthy eating choices. As this study has documented, neighborhood food landscapes in Philadelphia, like many large cities, are dominated by small corner stores that carry mostly processed and packaged foods with little or no fresh produce. Families depend on these stores and children are frequent customers. Borradaile et al. (2009) found that 42 percent of students in the city shop at corner stores twice a day, five days a week. Corner stores often lack the equipment to store perishable foods but with small investments from the Food Trust program, corner store owners can offer fresh foods and do so at a profit. This initiative is a partnership between the nonprofit, the Philadelphia Department of Public Health, the Pennsylvania Department of Community and Economic Development, and business and healthcare institutions such as AstraZeneca and Thomas Jefferson University Hospitals.

As discussed above, the implications of this study are far-reaching. Social entrepreneurs and leaders in business, government, healthcare, and nonprofits can each play an important role in addressing food injustice in large cities, particularly in underserved neighborhoods. Food justice is a pervasive global challenge but models of success, such as those identified above, already exist. These programs, partnerships, and business ventures address all three pillars of food justice by (1) providing increased access to healthy foods, (2) reducing the environmental costs of agriculture by going local and minimizing transportation, storage and logistical expenses, and (3) by engaging local communities in the production and/or distribution of healthy foods and the creation of a more just and equitable food system. They increase access to healthy foods while simultaneously conserving natural resources with more local and sustainable agricultural practices.

This study adds to the literature on food justice by demonstrating a clear link between food landscapes, access to healthy and nutritious foods, and public health

outcomes at the neighborhood-level of analysis, and by identifying recommendations to address these challenges. This study shows that where you live matters – those living in neighborhoods dominated by stores selling junk food are more likely to be obese and, therefore, to experience the health problems associated with obesity. Those living in neighborhoods with more healthy food options are less likely to be obese and to suffer the health consequences of obesity. Access to healthy foods is the first pillar of food justice.

This study presents certain limitations. The sample size is determined by the number of neighborhoods defined by the Department of Public Health in Philadelphia. It focuses specifically on the city of Philadelphia, which may impact its generalizability to other cities in the United States and around the world. In addition, some variables that may be pertinent to the study, such as knowledge of nutrition, are unavailable and not included in the analysis.

Overall, this study finds that public health suffers in urban neighborhoods where access to junk foods dominates access to healthy food options—a food justice challenge. It identifies a number of recommendations stemming from this finding for business, healthcare, and government leaders to consider when attempting to build more equitable food systems and address the Sustainable Development Goals of ending hunger, improving nutrition, promoting sustainable agriculture, and enhancing the health and wellbeing of all people, particularly those living in urban poverty.

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