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Attempts to Abolish Urban Food Deserts

According to the United States' Centers for Disease Control and Prevention (CDC), a food desert is a region in which residents do not have access to healthy nutritious food because they cannot overcome geographic and/or socioeconomic obstructions (1). Many nations around the world, including developed nations such as the United States, deal with serious food desert crises, especially in urban areas where convenient food options are limited to foods of low cost and low nutritional value (1). Multiple studies have shown that an absence of healthy options is linked to obesity, heart disease, and a wide variety of other severe health concerns (1). In addition to degrading the physical health of individuals, food deserts degrade the health of a society as a whole by widening the gap between socioeconomic stations (which are often the root of food deserts themselves). In a study conducted by Ghosh, Martin, Page, Wolff, McMinimee, and Zhang, it was found that larger supermarket chains that sell quality produce at reasonable prices are rarely found in low income and food insecure areas, perpetuating the construction of small and medium food shops that either sell low quality produce or sell it at excruciatingly high prices (2). They were able to conclude, among other things, that low income residents of inner cities were more susceptible (after accounting for transportation accessibility) to food deserts than the more affluent residents of the suburbs (2).

Since food deserts often lead to a variety of public health concerns (1) and other social issues, (2) many cities, states and organizations that promote public health and welfare have dedicated enormous resources to experimental interventions to turn food deserts into food oases. According to the CDC, there are four recommended types of intervention programs that can turn food deserts into food oases: community gardens, tax incentives, improved transportation, and changes in urban zoning (1). While the CDC hypothesizes that any of these four programs will improve food availability, this paper hypothesizes that no single intervention will be able to eradicate a food desert, or even to improve food availability to a significant extent. Instead, it is expected that only an effort of coordinated programs that collectively address all three contributing factors of limited food availability (geographic, social, and economic) will successfully create a food oasis from a food desert.

New York City was home to one experiment in eliminating food deserts. In 2008, the city's health department began issuing licenses for "Green Carts," mobile fruit and vegetable stations intended to provide fresh and healthy produce to residents of food deserts in The Big Apple (3). Each cart was independently owned and operated, and could locate anywhere within the city (specific boundaries were set by the health department) but were not explicitly limited to regions classified as "food deserts" (3). In 2013, researchers Li, Cromley, Fox, and Horowitz analyzed the locations of food carts over the course of the five years during which the experiment was taking place. They then compared the actual locations of the carts to a number of "candidate sites" (all intersections nearest the center of every census tract in New York City, each of which was considered a possible Green Cart location). Of the 644 candidate sites, 37% were located in food deserts, so it was expected that at least 37% of the Green Carts would serve these needy areas (3) – but this was not the case. Of the 494 permits issued by August 2013, only

265 Carts were active and accounted for. And of the known carts, only 7% were located in food deserts; in fact, the majority of the Green Carts (51%) were in areas classified as healthy (based on the number of nearby supermarkets and produce vendors) and served clientele not at risk of suffering the negative effects of poor nutrition (3). The remaining Green Carts (41%) were in relatively healthy “food swamps,” which fall between food deserts and healthy areas in terms of access to nutritional food (3). These statistics indicate that the Green Carts disproportionately served customers who could afford their products, not customers in food deserts who needed fresh produce the most. In fact, additional analysis showed that proximity to subway stations, offices of large employers, and high density residential areas played a larger role in determining the location of Green Carts than did the presence of a food desert (3).

When the program was established, the health department was prepared for such news; since carts were privately managed, their owners would benefit from placing their businesses in areas that could better support them economically (almost by design excluding the low income areas that tend to foster food deserts). Program designers also recorded the number and locations of carts that accepted Electronic Benefits Transfer (EBT, commonly referred to as food stamps.) Only 43 of the 256 carts choose to accept this form of payment (which may have deterred customers with the greatest need.) It is also interesting to note that these carts were no more likely than carts not accepting EBT to be located in food deserts, which suggests that requiring Green Carts to accept food stamps would not necessarily increase their presence in high need areas (3).

Despite the mounting evidence that Green Carts failed to effectively provide fresh produce in food deserts, New York city’s Health Department does not consider the experiment a complete loss. Officials argue that the increase of produce availability all over the city increased

competition and drove down the prices of fruits and vegetables, making them more accessible to both residents of food deserts and other regions (3). This claim, regrettably, has yet to be quantified and accepted.

Based on the results of New York City's 2008 experiment, it can be concluded that providing enterprising citizens with produce businesses not specifically located in food deserts will fail to satisfy the need in target areas. The failure of this single pronged program (which only targeted geographic, not social or economic, obstructions to accessing nutritious food) proves that a more holistic approach is necessary to abolishing food deserts, as is predicted by the hypothesis of this paper.

Like New York City, Chicago deals with major food availability crises and is seeking solutions that will eliminate its food deserts. Appelhans, Lynch, Martin, Nackers, Cail, and Woodrick of Rush Medical University, working with funds provided by the Consortium to Lower Obesity in Chicago Children, designed a program that sought to decrease geographic limitations to food access not by improving transportation, but by eliminating the need for transportation at all; the researchers studied the effectiveness of an online grocery service. Researchers recruited 37 participants identified as residents of food deserts and as the primary food purchaser of their families (4). Each received an \$80 voucher to use in an online grocery store to pay for both food and delivery fees (which ranged from \$6.95 to \$9.95.) Of the 37 recruits, 34 completed the study.

The effectiveness of this method was based almost solely on the evaluation of the participants. Most made the vague claim that they were "somewhat dissatisfied" or "somewhat satisfied" with the overall experience (4). According to other survey questions, the root of most of the general dissatisfaction was with the price of the food in the online grocery store (even

though researchers intentionally correlated to the prices in traditional stores nearby) but the cost of delivery may have been factored into the participants' perception of the expense (4).

Conversely, most participants were satisfied with the variety and quality of the goods they purchased (4). During the final survey, participants were asked to address factors that would improve the likelihood of continuing their patronage of the online grocery store, yielding four factors that surfaced as the most important. Customers identified food prices (specifically that they be at or below market prices) and delivery within one day or less as the two most important parts of the shopping experience. Secondarily they reported that acceptance of food assistance (food stamps) and the ease of shopping online would be crucial to their continued shopping (4). After the experiment, 54.5% said they would use the Internet grocery service one to six times per year if it continued to be available, and 18.2% said they would use it monthly (4). While these numbers do not indicate overwhelming support and full commitment to this new practice, they suggest that small improvements in this program may lead to a highly successful intervention.

This experiment provided valuable insight into the potential institutionalization of Internet shopping as a means of overcoming geographic obstacles to accessing food. Even though the idea to integrate technology itself is ingenious, research designers failed to notice flaws in this idea that greatly hinder its overall effectiveness. Mainly, they ignored the fact that many homes that are struggling economically to acquire food do not have the disposable income required to support convenient Internet access. When selecting candidates for the study, they systematically ruled out potential participants who could not access their online grocery store, and in doing so may have eliminated the candidates who represented the most under served parts of the community.

After thoroughly analyzing the results, Appelhans and his fellow researchers determined that the use of Internet Grocery Shopping was only partially effective in eliminating food deserts (4). The afore mentioned hypothesis would have predicted this result; like the Green Carts in New York City, this program only resolved the geographic obstacles to purchasing food, not social or economic impediments. In fact, the responses of the participants highlight the failure of this intervention to deal specifically with financial barriers; they complained about prices, indicating that they were still economically disempowered.

Researchers Sadler, Gilliland, and Arku performed a similar experiment that addressed how the construction of an entirely new supermarket in a food desert would affect the residents of Flint, Michigan in 2010. Researches chose two towns with largely identical demographics in Michigan to compare; Beecher (the control city, used as a standard of comparison) and Carriage Town (the experimental city, which received the treatment: a new grocery store) (5). A new supermarket, Witherbee's, was constructed in Carriage Town with the specific purpose of determining whether or not its presence could improve the eating habits of the town's inhabitants, but also with a more relevant secondary objective: to determine whether or not new grocery stores alone can abolish food deserts.

Before the store was constructed, a randomized telephone survey was conducted to assess the eating and grocery-buying habits of both cities and to determine the boundaries of existing food deserts within city limits. Despite low response rates, it was confirmed that both cities showed similar poor eating habits and high rates of obesity and other food-related health concerns, and that both showed similarly high rates of food insecurity and subsequently high rates of food deserts (5). This established that the two cities were adequately similar and

therefore that any differences noted after the intervention could reasonably be attributed to the program itself and not confounding variables.

The results of this intervention surprised the researchers; it was predicted that such a basic and seemingly obvious modification in a community would have at least a marginal effect on its residents, but no effect whatsoever was observed. While the food desert was “destroyed” with the arrival of a new source of nutritional food, there was no change in the eating habits of the nearby residents; they continued to eat unhealthy foods and shop at the same markets they had patronized before. Ultimately, Witherbee’s closed at the end of 2011 (only 17 months after opening) (5).

The surprising evidence presented by this failed experiment serves to further the validity of the hypothesis: only programs that target social, economic, and geographic obstacles will successfully eliminate food deserts. This experiment ignored social contributions to food inaccessibility – the residents’ ingrained eating habits were not addressed, so they did not respond to the presence of a new and healthy alternative, despite its geographic advantages. Additionally, the researches surmised that the slightly higher prices at Witherbee’s may have discouraged potential customers from shopping there, signifying that economic concerns were not addressed either.

A study conducted in Edmonton, Canada, in 2014 by Wang, Qiu, and Swallow explored the effects of community gardens and farmers’ markets on food deserts. Using comprehensive mapping software, Wang and his coworkers recorded the locations of the 96 supermarkets, 61 registered community gardens, and 17 farmers’ markets in the 247 residential neighborhoods of the city (6). They also noted demographic trends that were of interest (e.g. each neighborhood’s

population of senior citizens, since the elderly are often considered an at-risk group due to their limited mobility).

Analysis of their data yielded a number of noteworthy results. Most importantly, they showed that 72% more citizens lived within 1km of a community garden, farmers' market, or supermarket than within 1 km of a supermarket (6), so these two alternative sources of food greatly increase accessibility to nutritious food. Although this evidence indicates that community gardens and farmers' markets are largely successful at abolishing food deserts, it is imperative to note that these food sources are only available for a few months every year (parts of summer and fall) and that the produce available is not enough to provide food for the entire community that cultivates it (6). The United State's CDC explicitly declares that community gardens improve food accessibility conditions, but it fails to recognize that many food deserts lie in areas where gardening is not feasible year round. Wang and his fellow researchers also found that community gardens and farmers' markets tend to cluster around existing larger supermarkets (6), which suggests that the placement of these gardens and markets is not ideal; in order to reach the neediest populations and most effectively improve the health of a city, gardens must be strategically located (much like the Green Carts in New York City). Before accounting for the presence of community gardens and farmers' markets, it was determined that eight neighborhoods in Edmonton were in food deserts, afterwards, four of these eight neighborhoods were still in food deserts (6). That only half of the city's food deserts were abolished furthers the argument that gardens and markets' must be carefully placed.

Like all of the pervious experiments, this study confirms the hypothesis; an intervention that only targets one of the three roots of food deserts will prove to be largely unsuccessful. While the presence of community gardens and farmers' markets increased the economic

potential of Edmonton's to access nutritious food (garden crops are free and farmers' markets generally sell food at lower prices (6)) food deserts continued to be prevalent in many areas, mainly because the locations of these two alternative food sources was not ideal.

All of the experiments presented confirm the hypothesis: a program will successfully eradicate food deserts only if it addresses social, economic, and geographic obstacles to accessing food. Food deserts are complex problems, and thus require complex and multifaceted solutions. Before this global issue can be taken on, however, researchers still need to determine how social factors play into the existence of food deserts, since in many experiments it was unexpected community habits that determined the success or failure of a program. As is often the case, the results of these experiments and studies call for more experimentation. While more data is being compiled, public policy makers and communities should be encouraged to try their own food desert eradication programs that aim to destroy the social, economic, and geographic factors that contribute to food deserts.

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