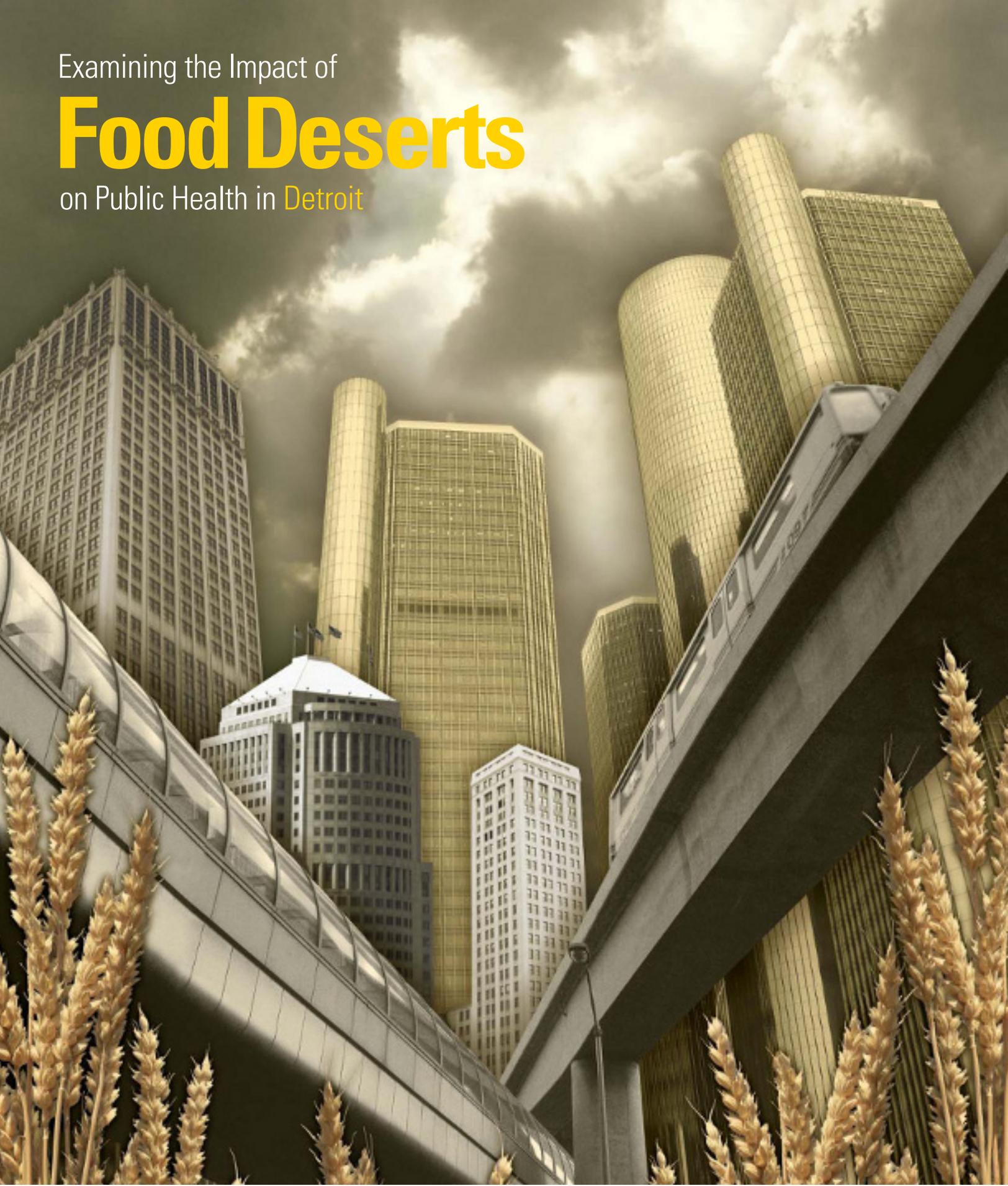


Examining the Impact of

Food Deserts

on Public Health in Detroit



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Pages 5-8 Only

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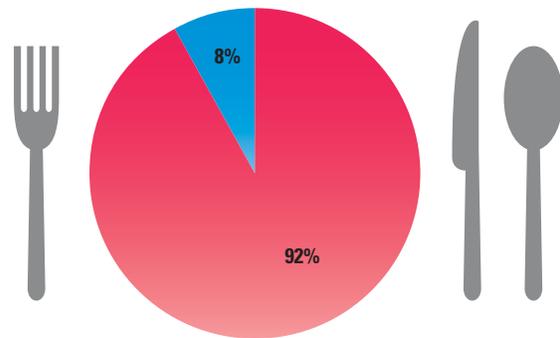
Over half a million Detroit residents live in areas that have an imbalance of healthy food options. They are **statistically more likely to suffer or die** prematurely from a diet-related disease, holding other key factors constant.

4. Why is there such a stark food imbalance in Detroit? The problem is not that there are no or few retailers that sell food. Many stores and restaurants sell food throughout Detroit. In fact, the average family would only need to travel a few blocks to reach some type of food option. The problem from a public health perspective is that there are relatively few food venues that appear to sell quality food or a good selection of healthy food. This is what creates the high degree of food imbalance that steals life and vitality from Detroit residents and from others throughout the region that live very close to many fringe food options, but far from a mainstream grocer.

5. The greatest contributor to the heavy concentration of fringe food options and to the negative diet-related health effects of food imbalance is not fast food, as we originally suspected, but USDA Food Stamp retailers. In Detroit, USDA Food Stamp retailers are primarily fringe food locations, such as gas stations, liquor stores, party stores, dollar stores, bakeries, pharmacies, and convenience stores. Only 8% of all Detroit Food Stamp retailers are small, medium, or large grocery stores or supermarkets by our definition. These fringe locations appear not to specialize in healthy foods but, instead, in the sale of 1) alcohol, 2) tobacco, 3) lottery tickets, and/or 4) a comparatively small selection of prepackaged and canned food products high in salt, fat, and sugar.

6. Because there is such wide-spread concentration of fringe Food Stamp retailers throughout Detroit, we suspect that the negative health effects associated with food imbalance impact not only the poor, but also thousands of additional moderate

Chart 2: Recoded Mainstream and Fringe Food Stamp Retailers in Detroit



Pie Chart Legend

Fringe Retailers: 92% Gas stations, liquor stores, party stores, dollar stores, bakeries, pharmacies, convenience stores, and other venues

Mainstream Retailers: 8% Small, medium, and large grocery stores and supermarkets

and upper income residents who also have difficulty reaching mainstream grocers on a regular basis or who have grown accustomed to the pervasive fringe food environment. Whether you are a diabetic, an elderly person, a young professional, or a mother trying to raise a healthy child, following a doctor's dietary recommendation is likely difficult if you live in one of these far out-of-balance areas.

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7. Looking ahead, food imbalance will likely have a compounding public health effect on communities as residents age in place, and on future generations that grow up and remain in food imbalanced areas. Unless access to healthy food greatly improves, we predict that, over time, those residents will continue to have greater rates of premature illness and death from diabetes, cardiovascular diseases, cancer, hypertension, obesity, kidney failure, and other diet-related complications. Food imbalance will likely leave its mark directly on the quality, productivity, and length of life, and indirectly on health care costs, school test scores, and the economic vitality of the city and the region.

Over the course of this study, we drove up and down just about every major Detroit corridor and visited the interiors of over 200 different types of retailers that sell groceries. Certainly there are examples of quality supermarkets, grocers, and farmers markets in Detroit. There are also very capable and energetic community, market, and government leaders committed to recruiting and supporting purveyors of healthy food. Yet the preponderance of fringe food is stark. That any major city located in a state with a rich tradition of agriculture can have such a high degree of food imbalance is troubling.

So what can be done? Identifying both market and needs-based strategies that promote access to nutritious food will require input from the food desert residents themselves, as well as from grocers, bankers, brokers, developers, planners, health advocates, philanthropists, government officials – ultimately everyone – to achieve even a modest level of success. Such a coalition would have a unique opportunity, not only to recruit new grocers, but to support product and infrastructure improvements to existing convenience and corner stores. Given that these store owners have already made a local investment and are continuing to serve the market, they might be our best hope yet for bringing fresh and healthy food – and

longer and more enjoyable life – to the residents of Detroit and the surrounding region.

Details

Examining the Impact of Food Deserts on Public Health in Detroit quantifies different types of food access at the lowest geographies possible and then tests our theory that a balanced food environment – shorter distances to grocers and longer distances to fast food and other fringe food options – directly correlates to better diet-related community health outcomes. While our focus is Detroit, our findings are more meaningful when placed in the context of the Detroit region as well as other Michigan locations, particularly concerning the distribution of Food Stamp venues by retail category. Detroit is distinct from other urban areas, yet its ability to offer healthy food options is tied to these broader market and government systems.

The city of Detroit has 11,373 census-defined blocks with non-zero populations. Most are majority African American. Metro Detroit (with Detroit excluded) has 32,419 census-defined blocks with non-zero populations. Most are majority White. In both Detroit and the surrounding region, there are small fractions of majority Latino and majority diverse blocks, meaning that no one race makes up 50% or more of the population in that block. We measured the distance between the geographic center of each block and the locations of each food venue for the region using the latitude and the longitude of each food venue and of each block center. Of these distances, the minimum distance was calculated for each block to each food category, and a weight was created to reflect the share of population living in

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that block. The average distance in a particular geography is the weighted average distance from each block to the nearest food venue, whether it is within or outside that particular municipality, with greater weights given to blocks with larger numbers of residents. Our distance score, calculated in miles, is the distance the average person from that area would need to travel to reach a particular food venue.

Our Food Balance Score is the average distance to any mainstream food venue divided by the average distance to a fringe food venue. Diet-related death data is used to calculate Years of Potential Life Lost, a statistic that measures the total number of life years lost due to premature death per 100 people in a population from a certain cause. Driver's license data, which includes height and weight⁶, were used to calculate body mass

index (obesity) scores. Data sources included the State of Michigan, the Metropolitan Detroit Cancer Surveillance System, part of Wayne State University, and USDA data on Food Stamp retailers, among others. (See the Detroit Project Technical Appendix at marigallagher.com for more details on the methodology and findings.)

Correlating food access and community health in a city such as Detroit presents many challenges. In addition to race and genetics, there are varying factors that can contribute to premature death of any type, such as poverty, low education levels, exposure to local pollutants, direct violent crime, indirect violent crime (such as assault on a caregiver or household wage earner), fear of engaging in health-promoting activities outdoors (such as walking, playing, or exercising) and personal choices and lifestyles (such as smoking, heavy alcohol use, and regularly eating less healthy foods, either by choice or necessity). Most urban areas that have experienced downturns in their local economies tend to suffer an upward spike in one or more of these dynamics. As a result, overall life expectancy for that population in a given period is difficult to measure. Our challenge is to determine if food imbalance, as one of many competing factors, shortens life potential in Detroit, holding constant income, race, and education, the three key variables that we can control in the analysis.

In our previous “food desert” work, the Food Balance Score is the ratio of mainstream grocers to fast food restaurants only; we did not analyze or include other fringe locations that sell food in the calculation. Detroit field work and insights from local stakeholders made clear the need to account for the high concentration and wide distribution of additional fringe food establishments in our distance and food balance calculations. We found no meaningful statistical pattern in Detroit or Metro Detroit when correlating our original Food Balance Score with diet-related health outcomes. Because there are so many additional venues almost everywhere besides fast food, that also sell unhealthy food products – such as convenience and liquor stores – this was not surprising. We needed to modify the Food Balance Score to reflect this reality for a meaningful analysis to be possible.

In our work in Detroit and other locations, we find that there is no “perfect distance” to a mainstream grocery store. To best understand where access needs to be improved, we look at the range of distances comprehensively block-by-block *within* a city, municipality, or rural area. We expect rural areas, for example, to have fewer and more distant grocery stores than in urban areas, where there is higher density and where fewer households own cars. In correlating food access to diet-related health outcomes, a more important measure is *food balance*, which tells us how easy or difficult it is to choose between a mainstream and fringe food location on a daily basis. An added benefit of developing food balance scores is that they can be compared *across* urban,

suburban, and rural geographies. For example, in a particular rural area, the closest mainstream grocer might be 3 miles away, but the closest fringe food establishment might also be 3 miles away. We would consider that area to be *in balance* in terms of food access; it is just as easy or difficult to reach one of the

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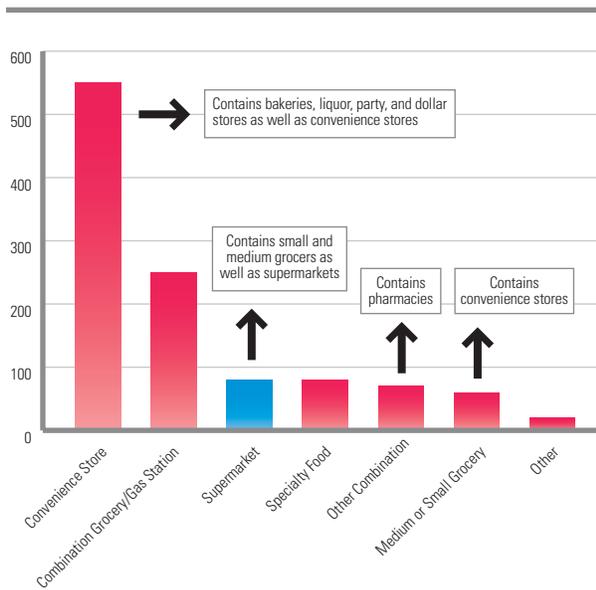
other food establishments. Our modified Food Balance Score is the distance to any mainstream food venue divided by the distance to a fringe food venue which includes but is not limited to fast food. As we see from maps 1 and 2 (pages 12 and 14), Metro Detroit has many out-of-balance areas, but the starkest patterns are in Detroit itself. Roughly 550,000 Detroit residents – over half of the city’s total population – live in areas that are far out-of-balance in terms of day-to-day food availability. This means they must travel twice as far or further to reach the closest mainstream grocer as they do to reach the closest fringe food location. How does this impact community health?

To understand the relationship between food balance and community health, we calculated Food Balance Scores for every tract in Detroit and the vast majority of tracts in the Detroit Metro area, built up from the block level each time, and cor-

“The Food Stamp Program serves as the first line of defense against hunger. It enables low-income families to buy nutritious food with Electronic Benefits Transfer cards.”

*- United States Department of Agriculture
Food and Nutrition Service website, March 2007*

related them with diet-related Years of Potential Life Lost (YPLL) scores. We see that, as tracts become more out-of-balance in terms of food access, YPLL increases. We are unable to control for other variables in Chart 1; the findings are suggestive, not conclusive. However, we used regression analysis to measure the impact of food balance on diet-related YPLL, this time holding education, income, and race constant. (See the Appendix at marigallagher.com for more details) We found that food imbalance is a statistically significant contributor to worse diet-related health outcomes in both Detroit and in Metro Detroit. Detroit suffers most. Roughly 550,000 Detroit residents – over

Chart 3: Official Food Stamp Retail Categories and Distribution for Detroit

half of the city's total population – live in areas that are far out-of-balance in terms of day-to-day food availability. This means they must travel twice as far or further to reach the closest mainstream grocer than they do to reach the closest fringe food location. Unless access to healthy food greatly improves, we predict that, over time, those half million Detroit residents will continue to have greater rates of premature illness and death from diabetes, cardiovascular diseases, cancer, hypertension, obesity, and other diet-related conditions.

Because most Detroit retailers that sell any type of groceries choose to participate in what is commonly referred to as the Food Stamp program, we turned to Food Stamp retailer data as our key method of sorting and quantifying local food choices. What we found surprised us. The data are accurate in terms

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of all-food-store inclusion and specific business address, but misleading in terms of official categorization. Furthermore, we found that Food Stamp retailers are the biggest contributor to food imbalance and the negative diet-related health effects associated with food imbalance.

We analyzed roughly 1,100 Food Stamp retailers. According to their official categories as provided in the original dataset, the majority are “convenience stores.” As we can see from

Chart 3, only a small fraction are listed as supermarkets or small or medium grocers. Already we can see that most of these retailers are fringe by nature; they are not grocers or supermarkets. Furthermore, we found that the data often required recoding to more accurately reflect the true nature of the establishment. We were able to do this through four key

Official food stamp data required recoding to reflect the true nature of the establishment.

steps. First, we conducted a manual record-by-record review of all Detroit food venues in the database. Second, we ran an electronic search for keywords in the business name, such as liquor, bottle, beer, wine, party, dollar, and bakery to flag venues we otherwise might miss that should be examined for possible recoding. Third, we conducted field inspections to check overall data accuracy. (Field inspections consisted of driving up and down most Detroit corridors and visit-

Food Balance Theory

As communities become more out-of-balance in terms of food options, negative diet-related health outcomes increase, holding constant other key factors

Food Balance Score Description	Examples
Far above 1: High score and worst outcome	Mainstream food venue is 1 mile away, and fringe food venue is .5 miles away $1/.5 = 2$
Around 1: Average score and Average outcome	Mainstream food venue is 1 mile away and a fringe food venue is 1 mile away $1/1 = 1$
Far below 1: Low score and best outcome	Mainstream food venue is .5 mile away and a fringe food venue is 1 mile away $.5/1 = .5$

ing the interiors of over 200 food venues. In many cases, the official name of the store did not reflect its appearance or the name on its exterior. For example, a store might have a neutral or upbeat name such as “Happy Foods,” but on the store sign and/or building, the most prominent words might include some combination of liquor, beer, wine, party, lotto, and money orders, followed by food or groceries, in smaller type.) Fourth, we manually revisited each business record for final recoding decisions.

Fifty-six percent of “convenience stores” were recoded into party stores, liquor stores, dollar stores, bakeries, and other venues. “Supermarkets” often contained not only supermarkets but what we consider small or medium size grocers. Many establishments in the official category of “small or medium grocer,” however, appeared to function more like convenience stores. “Other combination” mostly consisted of pharmacies, but pharmacies were also found in other categories. We did not evaluate whether or not Food Stamp retailers met either the technical or intended federal require-