

Farmers' Market Accessibility in Philadelphia

Background

Of the ten largest cities in the United States, Philadelphia has the highest obesity rate. 68% of adults and 41% of children are obese. Only 25% of youth and 30% of adults get their daily serving of fruits and vegetables (CDC, 2013). Unfortunately, people of low-incomes are the most at risk for obesity, yet rarely have the necessary healthy food options to reverse this trend. Recently, organizations have advocated for farmers' markets as a solution for increasing access to produce. However, there is a perceived notion that farmers' markets are not as available to lower-income populations. With people of lower-incomes the most vulnerable for obesity, it is vital that they have equal access to farmers' markets as people of higher-incomes.

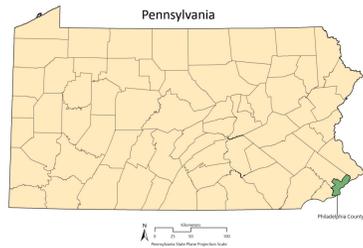


Figure 1. Philadelphia is a city on the southeast side of Pennsylvania.

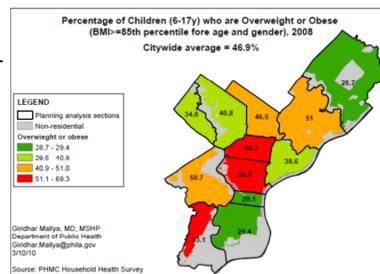


Figure 2. This map shows which neighborhoods childhood obesity in Philadelphia is most prevalent, courtesy of the Philadelphia Department of Health.

Proximity to Farmers' Markets by Income Level

Low-Income Families

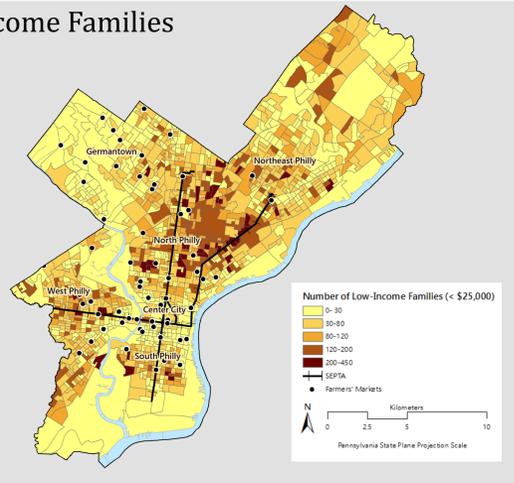


Figure 4. The most concentrated areas of low-income families per block group are in the neighborhood of North Philadelphia. Although the subway, or SEPTA, runs through that area, most farmers' markets are near Center City. Also, according to Figure 1, the low-income areas and those with the highest level of childhood obesity coincide. This data shows that farmers' markets should be located near North Philly to combat high obesity levels.

High-Income Families

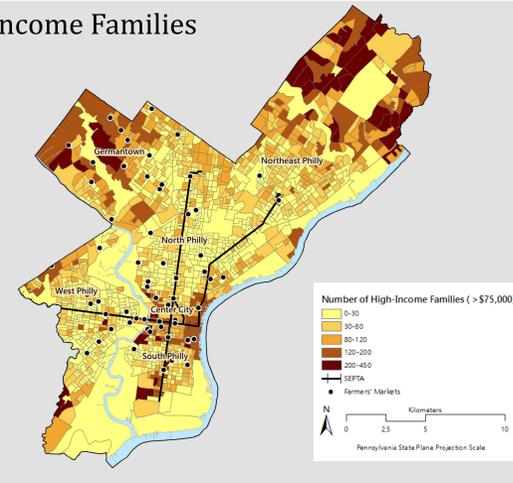


Figure 5. The most concentrated areas of high-income families per block group are in Center City and Germantown. There are already many farmers' markets in these areas, especially in Center City. Also, according to Figure 1, the neighborhoods with the most farmers' markets have the lowest childhood obesity levels. It appears from this data that high-income families have more access to farmers' markets than low-income families.

Results and Discussion

As hypothesized, low-income people have the least access to farmers' markets, with only 8760 families having available markets. High-income families followed, having moderate access, and middle-income families had the greatest access. These numbers could be either an underestimation or overestimation due to a bias introduced by using Census block groups. With smaller levels of aggregation, the data would be more accurate in terms of the concentration of families in an area. Additionally, if new markets have been added or old ones have been taken away since 2013, these counts may be outdated.

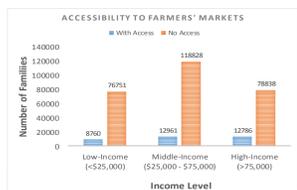


Figure 7. Low-income families have the least access to farmers' markets, followed by high and middle-incomes.

However, when considered in terms of percentages, the results differ from those of the raw counts because there was not an equal number of people in each income level. Here high-income families have the highest percentage of access to farmers' markets (14%) and low and middle-income families share roughly the same access (10%). This data shows that there is a lack of farmers' markets throughout the city because each income level shares a relatively low percentage of people with available markets.

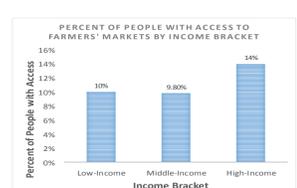


Figure 8. Low-income and middle-incomes have the lowest percentage of people with access with high-income having the highest percentage.

Methodology

This study examines whether low-income populations have the same access to farmers' markets as people of higher-incomes. It then determines a location for a new farmers' market which will increase access for low-income people in Philadelphia.

The first model determined whether people of low-incomes are near (or not near) existing farmers' market. After creating a buffer 400 meters around the existing farmers' market and intersecting those with Census data, Summary Statistics counted how many people of low, middle, and high-incomes were near (or not near) markets.

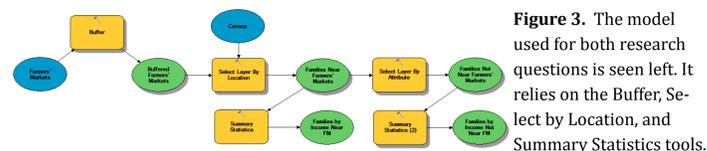


Figure 3. The model used for both research questions is seen left. It relies on the Buffer, Select by Location, and Summary Statistics tools.

The second model used a similar form as the first, but instead replaced the farmers' markets with subway stations. After making a 400 meter buffer around the subway stops and intersecting it with the Census data, Summary Statistics calculated which stops were most accessible to low-income people.

Locations for New Farmers' Markets

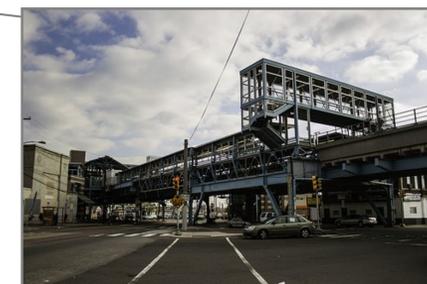
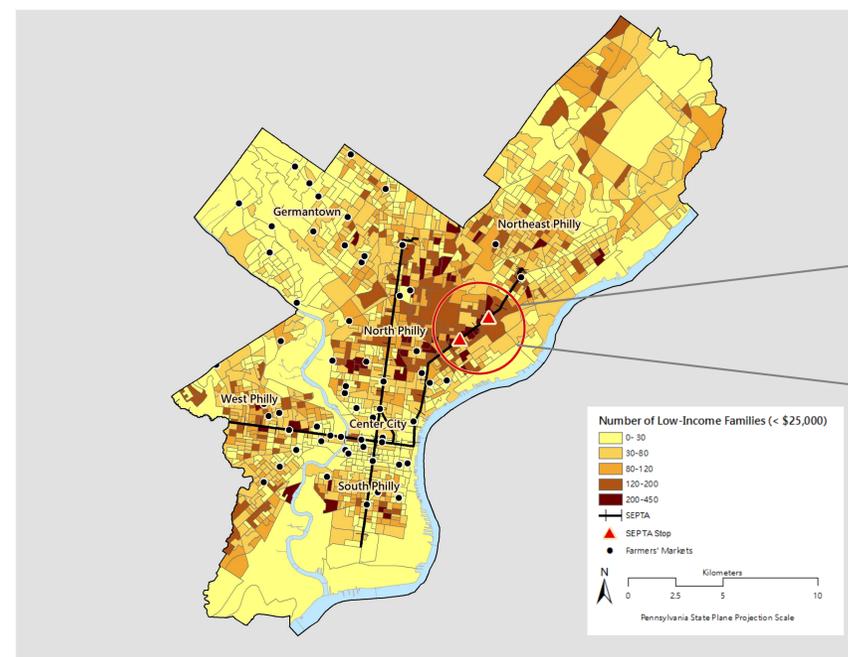


Figure 6. See "recommendations" section for further explanation of images.

Recommendations

The two SEPTA stops with the highest number of low-income families were found, as summarized by the table below. Based on these results, new farmers' markets should be located near these stops.

SEPTA Stop	SEPTA Line	Low-Income	Middle-Income	High-Income
Erie/Torresdale	Market-Frankford	307	88	55
Allegheny-MFL	Market-Frankford	241	113	32

However, a limitation of this study is that many people use the bus rather than subway lines. Factoring in how many people use subway versus buses in these areas would have improved the suitability of these results when deciding where to put new farmers' markets.

Overall, there should be a more farmers' markets in Philadelphia, with a more equal distribution throughout the city. As a community at high risk for obesity, low-income families should must share the same access to farmers' markets as those of higher-incomes.