FOOD for EVERY CHILD

THE NEED FOR MORE SUPERMARKETS
IN MARYLAND

SPECIAL REPORT

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MARYLAND, despite its reputation as one of the wealthiest states in the nation,¹ is home to many communities with too few supermarkets. This shortage of supermarkets means that residents, particularly those in lower-income communities, face much greater challenges finding fresh produce and other foods necessary to maintain a healthy diet.

The Food Trust conducted an extensive mapping study of Maryland to identify lower-income communities with limited access to supermarkets and high rates of diet-related disease. Statewide data was collected from standard business and health sources, and maps were created focusing on the state as a whole, as well as on the city of Baltimore. This report shows that supermarkets in Maryland are disproportionately located in higher-income communities. A recent study published in the *American Journal of Preventive Medicine* highlighted this issue in Baltimore: the study found that lower-income neighborhoods have fewer supermarkets than higher-income neighborhoods. The situation in Maryland is not unique; a nationwide study of over 28,000 ZIP codes found that low-income ZIP codes have 25 percent fewer per capita supermarkets than middle-income ZIP codes.

The lack of access to healthy affordable foods has a negative impact on the health of children and families. A growing body of research indicates that people who live in communities without a supermarket suffer from disproportionately high rates of obesity, diabetes and other diet-related health problems.⁴ It is in the interest of the entire community to solve this problem, a fact made all the more evident by the estimated \$1.5 billion that Maryland spends each year treating obesity-related diseases.⁵

Through mapping, this study concludes that many communities in Maryland with poor supermarket access also have a high incidence of diet-related deaths. In contrast, when people live in a community with a supermarket, they tend to eat more servings of fruits and vegetables and are more likely to maintain a healthy weight. A study that used data from North Carolina, Baltimore, and New York City found that adults who lived more than one mile from a supermarket were 25 percent to 46 percent less likely to eat a healthy diet than those with many supermarkets near their home. Supermarkets provide the most reliable access to nutritious and affordable food, and their presence is an important indicator of a community's physical health and economic vitality.

Maryland spends an estimated \$1.5 billion each year treating obesity-related diseases.⁹

We call upon state and local governments to take the lead in developing public-private solutions that can respond to the supermarket shortage in Maryland. Improving access to supermarkets in underserved areas will improve health, create jobs, and spur economic growth in areas that need it most.

Public-private responses that have proven successful elsewhere in the country, such as Pennsylvania's Fresh Food Financing Initiative,⁸ have included:

- Convening leaders from the business, government, public health, economic development and civic sectors to develop a strategy to establish more supermarkets in lower-income communities.
- Strategic investments with public funds to reduce the risks associated with the development of more supermarkets in lower-income communities.

INTRODUCTION

Despite its reputation as one of the wealthiest states in the nation, Maryland is home to many communities with too few supermarkets.¹⁰

This shortage of supermarkets means that residents, particularly those in lower-income communities, face much greater challenges finding fresh produce and other foods necessary to maintain a healthy diet. This issue affects residents across the state: over 1.2 million Maryland residents, including approximately 300,000 children, live in lower-income communities underserved by supermarkets.¹¹

Obesity and obesity-related conditions are serious problems in Maryland. According to recent data, the obesity rate for adults in Maryland nearly doubled over the last 15 years, growing from 15 percent in 1995 to 27 percent in 2010.¹² Heart disease and stroke are among the top three leading causes of death in Maryland, accounting for nearly one-third of all deaths in the state, and overweight or obese adults are significantly more likely to suffer from these conditions.¹³ Many lowerincome residents in Maryland suffer from obesity and other diet-related health problems. A recent study found that over 30 percent of children ages 2 to 5 from lowincome families in Maryland are overweight or obese. 14

Over the past 15 years, the obesity rate in Maryland has nearly doubled.18

At the same time, many families in Maryland have few, if any, places in their neighborhoods where they can shop for healthy, affordable foods. This problem impacts urban neighborhoods, in cities like Baltimore, where residents must often take multiple trips on public transportation or drive long distances to shop for groceries. This problem is also burdensome for rural communities, in areas like the Eastern Shore, where residents often have to travel long distances to reach the nearest food store. Maryland's supermarket deficit could be eased and diet-related health problems decreased by embracing an initiative to build more supermarkets and other healthy food markets in underserved communities, resulting in improved health for children and families.

A growing body of research demonstrates that when people have access to supermarkets they eat more fruits and vegetables and are more likely to maintain a healthy weight.¹⁵ Both the Institute of Medicine and the Centers for Disease Control and Prevention have independently recommended increasing the number of supermarkets in underserved areas in order to help reduce the rate of obesity in the United States. They also suggest that state and local governments should create incentive programs to attract healthy food retailers, such as supermarkets, to these underserved neighborhoods.¹⁶

Such an investment would have economic benefits. as well. Supermarkets create jobs and revitalize communities, serving as retail anchors and spurring complementary development nearby.¹⁷

The Food Trust conducted an extensive mapping study of Maryland to identify lower-income communities with limited access to supermarkets and high rates of diet-related disease. Statewide data was collected from standard business and health sources and maps were created focusing on the state as a whole, as well as on Baltimore. The Food Trust researched and wrote Food for Every Child: The Need for More Supermarkets in Maryland to identify the communities with the greatest need for supermarkets.

This study builds on the excellent work undertaken over the past several years by a variety of government, private, and civic leaders in Maryland to reduce and prevent obesity and improve access to healthy foods. Despite these efforts, this report demonstrates that there is still more work to be done in Baltimore and at the state level to ensure that all residents have convenient access to supermarkets selling healthy, affordable foods. The Food Trust is committed to building on this success and working with state and local leaders to improve access to supermarkets and other healthy food retail for residents across the state.

Methodology

To investigate supermarket access in Maryland, a series of maps was created using Geographic Information Systems computer software. A geographic representation of food access, income and diet-related disease was developed by mapping the locations of supermarket sales, income and diet-related mortality data. (See Appendix for more detail.) Retail sales data for supermarkets were obtained from Trade Dimensions, Diet-related mortality data for 2008 were provided by the Maryland Department of Health and Mental Hygiene and demographic data were derived from the American Community Survey 2005–2009. The maps were reviewed with The Food Trust's partners in Maryland, including the Johns Hopkins University Center for a Liveable Future, the Baltimore Development Corporation, and the Maryland Department of Health and Mental Hygiene.

Weekly sales volume at supermarkets was distributed over a one-mile radius to plot the concentration of sales and then divided by total population density and the average for weekly sales per person to calculate a ratio for weekly supermarket sales per person. The ratios were mapped; ratios greater than 1 represent high sales and ratios less than 1 represent low sales. Median household income was multiplied by the number of households to determine total income density. The term "lower income" in this report is used to define areas where the average household income is less than the median annual income, except when citing a separate study.

A total of 20,618 diet-related deaths were mapped across the state, including 3,235 in Baltimore. The ratio of deaths per total population was mapped. "High" diet-related mortality areas are defined as having diet-related death rates greater than the statewide average; "low" areas have diet-related death rates lower than the statewide average. Only data for Maryland were analyzed, so no comparisons were made with rates outside of the state.

KEY FINDINGS

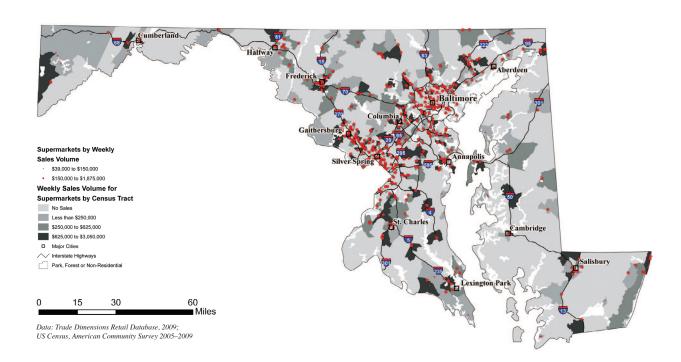
Access to healthy, affordable foods is not evenly distributed in Maryland. Many people have to travel excessive distances to buy food at a supermarket.

■ The uneven distribution of supermarkets is a serious problem in Maryland. There are large areas of the state with few supermarkets, and many communities where none exist. This situation is reflected at the local level in Baltimore, where substantial gaps in supermarket access exist.

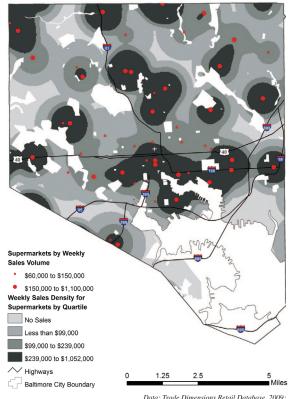
MAP 1A/B: Weekly Sales Volume for Supermarkets shows the location of 573 stores throughout Maryland, including 48 in Baltimore, and the weekly sales volume at each store. The smaller red circles represent lower weekly sales volume; the larger red circles represent higher weekly sales volume. The gray shading shows how supermarket sales are distributed across each census tract. The darkest areas have the highest concentration of supermarket sales, whereas the light areas have the lowest sales, indicating that few or no supermarkets are located there.

Map 1A shows that supermarkets in Maryland are unevenly distributed. Supermarkets are highly

1A: Weekly Sales Volume for Supermarkets in Maryland



1B: Weekly Sales Volume for Supermarkets in Baltimore



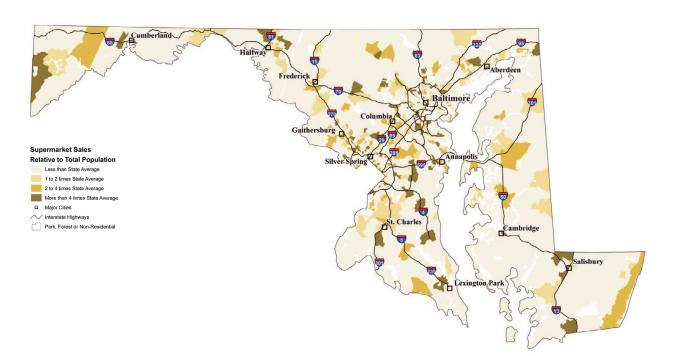
concentrated along major highways and in wealthier suburban areas, while many small towns and rural communities across Maryland are relatively underserved. This suggests that many people are traveling considerable distances to buy food at supermarkets in those areas where supermarkets are more easily accessible.

Map 1B features supermarkets in Baltimore and the concentration of sales across the city. Neighborhoods with the highest concentration of supermarkets and supermarket sales include Hampden and Charles Village in north central Baltimore, and Fells Point, Canton, Highlandtown, and Federal Hill near the Harbor. Neighborhoods with the fewest supermarkets are located predominately in western and eastern Baltimore and include Howard Park, Central Forest Park, Irvington, Brooklyn, Armistead Gardens, and Overlea.

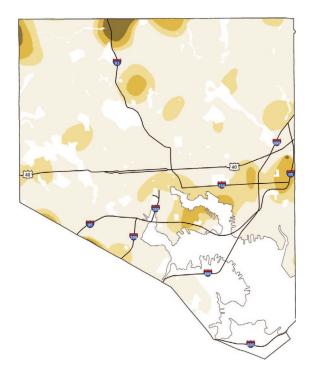
MAP 2A/B: Supermarket Sales and Total Population shows that the amount of supermarket sales in a particular location does not seem to be associated with the population of that area. Communities with greater than average supermarket sales relative to total population are shown in yellow and brown tones. In these communities, people are either spending more than average in supermarkets, as might be the case in higher-income communities, or more people are buying groceries in these communities than the number of people who live there, indicating that people are traveling from outside the area to shop there.

In Baltimore, areas with the fewest supermarkets are located predominately in western and eastern Baltimore and include Howard Park, Central Forest Park, Irvington, Brooklyn, Armistead Gardens, and Overlea.

2A: Supermarket Sales and Total Population in Maryland



2B: Supermarket Sales and Total Population in Baltimore



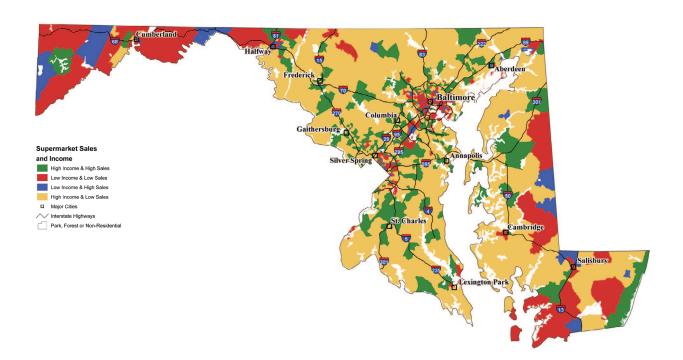
KEY FINDINGS

The uneven distribution of supermarkets in Maryland leaves a disproportionate number of lower-income people without access to healthy, affordable foods.

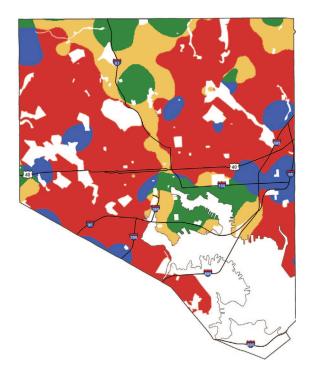
■ A recent study in the American Journal of Preventive Medicine highlighted this issue in Baltimore: the study found that lower-income neighborhoods have fewer supermarkets than higher-income neighborhoods. 19 This shortage of supermarkets particularly impacts lower-income residents with limited resources to obtain an adequate diet.

MAP 3A/B: Supermarket Sales and Income shows the distribution of supermarket sales and the distribution of income throughout Maryland and Baltimore. Higherincome areas with higher supermarket sales have the most healthy food resources and are indicated by the green areas of the map. In some lower-income areas, there are communities with higher than average supermarket sales volumes, as highlighted in blue. People in the areas shown in yellow have fewer supermarkets to shop at in their community. However, since these communities are higher-income and often have high car ownership rates, residents are likely able to drive to stores or to shop at small specialty food purveyors.

3A: Supermarket Sales and Income in Maryland



3B: Supermarket Sales and Income in Baltimore



The red areas represent lower-income communities that have fewer supermarkets and lower per capita supermarket sales.

MAP 4A/B: Low Supermarket Sales and Low Income further highlights areas with low supermarket sales because there are few to no supermarkets located there. Since income is also lower in these areas, families face more difficulty traveling to the areas where supermarkets are concentrated, especially when public transit is not accessible or convenient. Over 1.2 million Maryland residents, including approximately 300,000 children, live in these underserved communities.²⁰

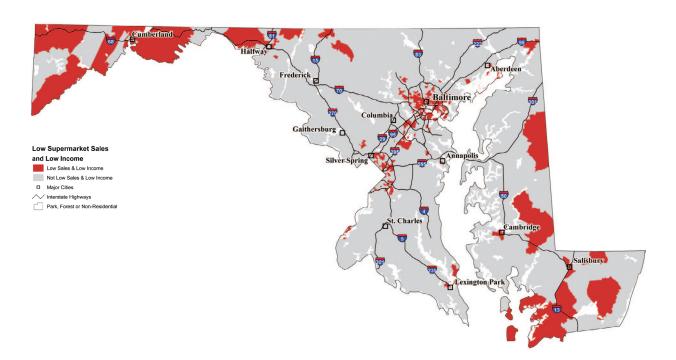
Lower-income communities with insufficient supermarket access can be found in urban and rural areas across the state of Maryland, including large areas of the Eastern Shore, sections of Prince George's County, Anne Arundel County, Baltimore County, and Baltimore City, along with large areas of Western Maryland. One study of three communities in Prince Georges County highlighted the impact of this issue: the report found that the majority of residents surveyed (both driving and non-driving) feel burdened by their inability to access a grocery store.²¹

In Baltimore, lower-income neighborhoods that are not well-served by grocery stores are concentrated in the western and eastern sections of the city, including

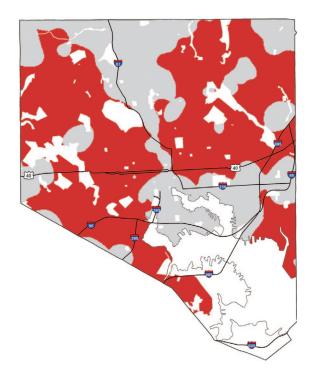
Howard Park, Irvington, Cherry Hill, Brooklyn, Berea, and Broadway East.

Several studies indicate that there are not enough grocery stores located within Metro Baltimore's underserved areas to meet the significant demand of their residents. A recent study found that underserved areas of the Metro Baltimore region have over \$350 million of grocery expenditure leaving these neighborhoods.²² Another study found that the city could support an additional 633,000 square feet of grocery retail space.²³ Therefore, many families must travel excessive distances to satisfy their demand for groceries.

4A: Low Supermarket Sales and Low Income in Maryland



4B: Low Supermarket Sales and Low Income in Baltimore



KEY FINDINGS

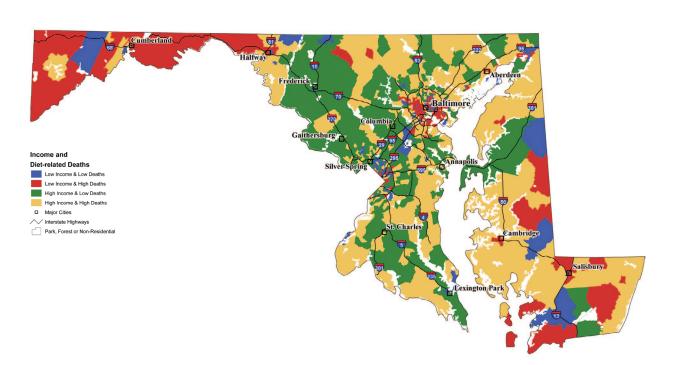
There is a connection between lack of supermarkets and diet-related disease.

■ The Food Trust and PolicyLink, a national research and advocacy organization, conducted a comprehensive literature review, which found that studies overwhelmingly indicate that people living in communities without a supermarket suffer from disproportionately high rates of obesity and other related health issues, while people living in communities with a supermarket are more likely to maintain a healthy weight.24

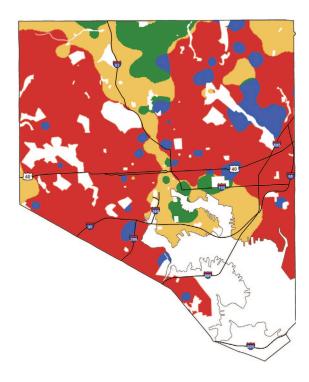
One study, for example, found lower body mass index among adolescents who live near a supermarket.²⁵ Another documented that fruit and vegetable intake increases as much as 32 percent for each additional supermarket in a community.²⁶ A study that used data from North Carolina, Baltimore, and New York City found that adults with no supermarkets within a mile of their home were 25 to 46 percent less likely to eat a healthy diet than those with many supermarkets near their home.27

MAP 5A/B: Income and Diet-Related Deaths shows diet-related mortality data by income in Maryland and Baltimore. The red areas indicate a higher than

5A: Income and Diet-Related Deaths in Maryland



5B: Income and Diet-Related Deaths in Baltimore



average rate of diet-related deaths occurring in lowerincome areas. The yellow areas display higher rates of diet-related deaths occurring in higher-income areas. The blue and green areas have lower rates of diet-related deaths.

In addition to the health consequences, treating diet-related diseases, such as hypertension, obesity, and diabetes, is costly for families and communities. Maryland spends an estimated \$1.5 billion each year treating obesity-related diseases.²⁸ Heart disease and stroke are among the top three leading causes of death in Maryland, accounting for nearly one-third of all deaths in the state, and overweight or obese adults

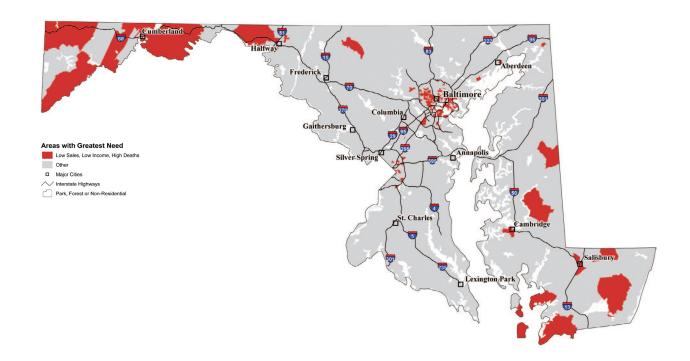
are significantly more likely to suffer from these conditions.²⁹ Diet-related deaths are associated with many factors, including the lack of access to a nutritionally adequate diet.

MAP 6A/B: Areas with Greatest Need displays lower-income communities where there is low access to supermarkets and a high number of deaths due to diet-related disease. These areas have the greatest need for more supermarkets.

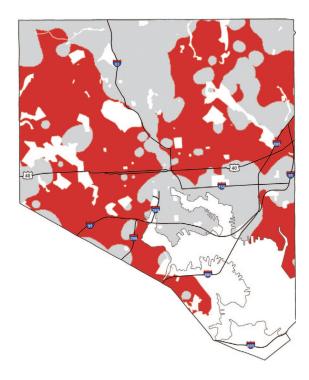
To provide healthy, affordable foods in these communities, and help address the high rates of obesity and other diet-related diseases, Maryland should encourage new supermarket development in lower-income areas where there are few supermarkets.

Increasing the availability of healthy, affordable foods in neighborhoods with high rates of diet-related diseases does not guarantee a reduction in their incidence. However, leading public health experts, including the Centers for Disease Control and Prevention and the Institute of Medicine, agree that it is a critical component in the fight against obesity.³⁰ Furthermore, the White House Obesity Task Force recently highlighted the importance of increasing access to healthy, affordable foods as one of its key recommendations.31

6A: Areas with Greatest Need in Maryland



6B: Areas with Greatest Need in Baltimore



CONCLUSION

The lack of access to supermarkets is a problem in many communities in Maryland, especially in lower-income areas where rates of obesity are high.

When communities lack access to healthy foods, adults and children have to rely on corner and convenience stores, which often stock lower-quality foods and have higher prices, or they have to travel long distances to purchase nutritious foods. Diets that rely on food from these types of stores often contain higher amounts of sugar and fat, which can contribute to obesity and other diet-related diseases.³²

The increased incidence of obesity and other diet-related diseases in lower-income communities suggests that the public sector needs to invest in supermarket development in these underserved areas to help reduce and prevent these diseases. Such an investment would have economic benefits as well, since supermarkets bring jobs to communities that need them the most.³³

The public sector has an opportunity to partner with the supermarket industry to improve health, create jobs, leverage private dollars, and revitalize neighborhoods by making investments in grocery store development. Over the long term, these initiatives will help to slow the growth of or reduce the obesity-related health care costs incurred by Maryland annually.

Through mapping, this study shows that many lower-income communities in Maryland have both poor supermarket access and a high incidence of diet-related deaths. This statewide problem is reflected at the local level in Baltimore, where significant gaps in neighborhood food availability exist. This study demonstrates that this issue is related to significant health problems that adversely impact children and families across the state.

RECOMMENDATIONS

Maryland must address the critical need for more supermarkets in many communities.

The number of supermarkets—and access to them—are key factors contributing to the health and economic development of communities. Many people living in lower-income areas without access to supermarkets suffer from high rates of diet-related deaths. Through public-private partnerships that incentivize fresh food retail development, we can increase the number of supermarkets in underserved communities and improve the health of children and families across the state.



We recommend that state and local governments in Maryland:

Convene leaders from the supermarket industry, government, public health, economic development and civic sectors to develop a strategy to establish more supermarkets in lower-income communities.

A key element of this strategy is for state and local governments to create a grant and loan program to support local supermarket development projects in order to increase the availability of affordable and nutritious food in underserved areas.

GIS Methodology

All Maryland statewide analysis was at the census tract level of geography and is prefixed by A); all Baltimore citywide analysis was done at the census tract level using interpolated rasters and density grids and is prefixed by B).

SUPERMARKET SALES

Supermarkets in the 2009 Trade Dimensions retail database were included in the analysis of sales. For the purposes of this study, the definition of a supermarket is any store that has a SIC code of 541105 and an annual sales volume of greater than \$2 million. There were 573 supermarkets in Maryland with an aggregate weekly sales volume of \$220,104,000, and 48 supermarkets in Baltimore with an aggregate weekly sales volume of \$14,330,000. Stores were plotted using the latitude and longitude coordinates for each record and then classified into two categories; above and below \$150,000 in weekly sales volume. Values of sales density were used to classify the A) census tracts and B) raster grid into the four categories shown in Map 1: Weekly Sales Volume for Supermarkets.

POPULATION

Population data for the State of Maryland and City of Baltimore by census tract was retrieved from the US Census Bureau website (www.census.gov) for the 2005–2009 American Community Survey (Maryland total of 5,637,418 people; Baltimore total of 639,337 people). Geographies with no population were removed from the analysis, as indicated on the maps.

SALES AND POPULATION

A) The weekly sales volume was divided by the total population of each census tract, and B) the density of weekly sales volume raster was divided by the density of total population raster. The result was then divided by \$39.04 (the statewide ratio of sales to population: \$220,104,000/5,637,418) to create an odds ratio for weekly supermarket sales per person for Maryland and Baltimore. An odds ratio of 1 is equivalent to the statewide/citywide rate. Anything below 1 is below the statewide/citywide rate. An odds ratio of 2 means the rate is twice the statewide/citywide rate. This is used for Map 2: Supermarket Sales and Total Population.

INCOME

Median household income (Maryland: \$69,475) was multiplied by number of households (Maryland: 2,092,538), and the result was divided by total population to create an average per capita income (Maryland: \$25,788.24). A) Local per capita income by census tract was divided by this number giving an income odds ratio above or below the statewide/citywide rate. B) The odds ratio, assigned to the census tract centroid, was used to interpolate a grid, which was then re-classified to yield two distinct values, those below and those above the odds citywide rate.

SALES AND INCOME

The "sales" and "income" odds ratios were combined resulting in four distinct values which correspond to the four possible combinations of high and low odds ratios, which were used to classify Map 3: Supermarket Sales and Income and Map 4: Low Supermarket Sales and Low Income.

DIET-RELATED DEATHS

The Maryland Department of Health and Mental Hygiene provided mortality data for the specified list of ICD-10 codes for the year 2008. A) A total of 20,618 diet-related deaths were mapped at the census tract level for Maryland, and B) a total of 3,235 diet-related deaths were mapped at the census tract level for Baltimore. The data were summarized based upon the census tract number to obtain a count of diet-related deaths per census tract.

DIET-RELATED DEATHS AND POPULATION

The total number of deaths attributed to each census tract was divided by the total population of that census tract. This result was divided by the statewide ratio of diet-related deaths to total population (Maryland: 20,618/5,637,418 = 0.003657, or 37 diet-related deaths per 10,000 people) to calculate an odds ratio. A) A new binary field was created to store whether the census tract had a "deaths" odds ratio above or below the statewide rate. B) The odds ratio, assigned to the census tract centroid, was used to interpolate a grid, which was then reclassified to yield two distinct values, those below and those above the statewide odds rate.

DIET-RELATED DEATHS AND INCOME

The two A) binary fields and B) rasters of "deaths" and "income" odds ratios were combined through multiplication to calculate a new layer. This resulted in four distinct values which correspond to the four possible combinations of high and low "deaths" and "income" odds ratios, which were used to classify Map 5: Income and Diet-related Deaths.

DIET-RELATED DEATHS, SALES AND INCOME

A) To combine all three variables, a new field was created and calculated by census tract as the product of "deaths" odds and the "low supermarket sales and low income" variable. B) The two reclassified rasters of "deaths and low supermarket sales and low income" variable were combined to create a new raster layer. These results were reclassified to only retain one value: "high deaths, low supermarket sales and low income" areas and mapped to produce Map 6: Areas with Greatest Need.

Endnotes

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Ensuring That Everyone Has Access To Affordable, Nutritious Food

The Food Trust, a nonprofit founded in Philadelphia in 1992, strives to make healthy food available to all. Research has shown that lack of access to healthy food has a profound impact on food choices and, therefore, a profound impact on health.

For almost 20 years, The Food Trust has worked with neighborhoods, schools, grocers, farmers and policymakers to develop a comprehensive approach to improving the health of America's children. The Food Trust's innovative initiatives integrate nutrition education with increased availability of affordable, healthy foods.

This approach has been shown to reduce the incidence of childhood overweight; a study in the journal *Pediatrics* found that the agency's School Nutrition Policy Initiative resulted in a 50 percent reduction in the incidence of overweight among Philadelphia school children.

"The Food Trust is transforming the food landscape one community at a time, by helping families make healthy choices and providing access to the affordable and nutritious food we all deserve."

• ROBERT WOOD JOHNSON FOUNDATION

The Food Trust is recognized as a regional and national leader in the prevention of childhood obesity and other diet-related diseases for this

and other notable initiatives to increase food access in underserved neighborhoods, including the Healthy Corner Store Initiative and the Pennsylvania Fresh Food Financing Initiative, a public-private partnership which has sparked the development of more than 90 fresh-food retail projects across Pennsylvania.

The Centers for Disease Control and Prevention honored the Fresh Food Financing Initiative in its Showcase of Innovative Policy and Environmental Strategies for Obesity Prevention and Control, and the program was named one of the Top 15 Innovations in American Government by Harvard University.

For more information or to order additional copies of this report, visit thefoodtrust.org or contact The Food Trust.

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