



FOOD *for* EVERY CHILD

THE NEED FOR MORE SUPERMARKETS
IN MINNESOTA

SPECIAL REPORT

ACKNOWLEDGEMENTS

This report was prepared by Eugene Kim and Miriam Manon of The Food Trust and David Treering, Geographic Information Systems Specialist at Loyola University. Photographs by Ryan Donnell. It was published in December 2011. This report was made possible by grants from the Robert Wood Johnson Foundation and the Kraft Foods Foundation.

MINNESOTA has fewer supermarkets per capita than most states; compared to national averages, Minnesota has 40 too few supermarkets.¹ 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 Minnesota to identify 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 the cities of Minneapolis and Saint Paul. This report shows that supermarkets in Minnesota and the Twin Cities are disproportionately located in higher-income communities. The situation in Minnesota 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.²

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.³ In 2004, Minnesota spent an estimated \$1.3 billion to treat obesity-related diseases.⁴ According to Blue Cross Blue Shield of Minnesota, the cost of treating obesity-related diseases is estimated to rise to \$5 billion annually by 2020 if steps are not taken to slow the rate of obesity.⁵

Through mapping, this study concludes that many communities in Minnesota 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.⁶ For example, a recent study by the Hennepin County Human Services and Public Health Department found that a lower-income neighborhood of North Minneapolis has “the highest percentage of adults who are overweight or obese, and is an area among those with the least access” to conventional grocery stores.⁷ 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.

In 2004, Minnesota spent an estimated \$1.3 billion to treat obesity-related diseases.

We call upon state and local governments to take the lead in developing public-private solutions that can respond to the supermarket shortage in Minnesota. 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

Minnesota has fewer supermarkets per capita than most states, ranking in the bottom third of states nationwide.⁹

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: nearly 900,000 Minnesota residents, including over 200,000 children, live in lower-income communities underserved by supermarkets.

Obesity and obesity-related conditions are serious problems in Minnesota. Over the past 15 years, the obesity rate in Minnesota has increased by 73 percent, with one in four adults currently suffering from obesity.¹⁰ In 2004, four obesity-related conditions—heart disease, stroke, cancer and diabetes—accounted for nearly 60 percent of deaths in Minnesota.¹¹ Many lower-income residents in Minnesota suffer from obesity and other diet-related health problems. A recent study found that one-third of children (ages two to five) from lower-income families are overweight or obese in Minnesota.¹²

Over the past 15 years, the obesity rate in Minnesota has increased by 73 percent, with one in four adults currently suffering from obesity.¹⁶

At the same time, many families in Minnesota have few, if any, places in their neighborhoods where they can shop for healthy, affordable foods. This problem is especially burdensome in rural communities, where residents often have to travel long distances to reach the nearest food store. Minnesota'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.¹³ 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.¹⁴

Such an investment would have economic benefits as well. Supermarkets create jobs and revitalize communities, serving as retail anchors and spurring complementary development nearby.¹⁵

The Food Trust conducted an extensive mapping study of Minnesota to identify 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 the cities of Minneapolis and Saint Paul. The Food Trust researched and wrote *Food for Every Child: The Need for More Supermarkets in Minnesota* 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 Minnesota 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 the Twin Cities and at the state level to ensure that all residents have convenient access to grocery stores 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 Minnesota, 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 2009 were provided by the Minnesota Department of Health and demographic data were derived from the 2000 U.S. Census. The maps were reviewed with several of The Food Trust's contacts in Minnesota, including the Minnesota Grocers Association, the Minneapolis Departments of Health and Family Support and Community Planning and Economic Development, and the Saint Paul Department of Planning and Economic Development.

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" 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 16,320 diet-related deaths were mapped across the state, including 1,600 in the Twin Cities. The ratio of deaths per total population was mapped. "High" diet-related mortality areas have diet-related death rates greater than the statewide average; "low" areas have diet-related death rates lower than the statewide average. Only data for Minnesota were analyzed, so no comparisons were made with rates outside of the state.

KEY FINDINGS

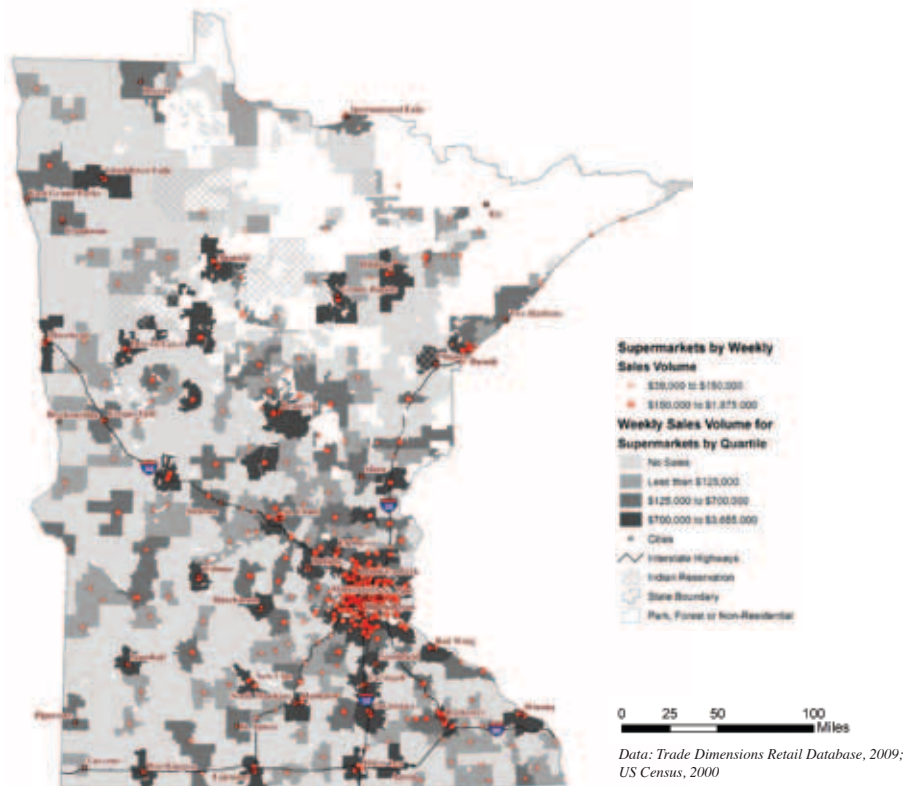
Access to healthy, affordable foods is not evenly distributed in Minnesota. Many people have to travel excessive distances to buy food at a supermarket.

- The uneven distribution of supermarkets is a serious problem in Minnesota. 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 the Twin Cities, where substantial gaps in supermarket access exist.

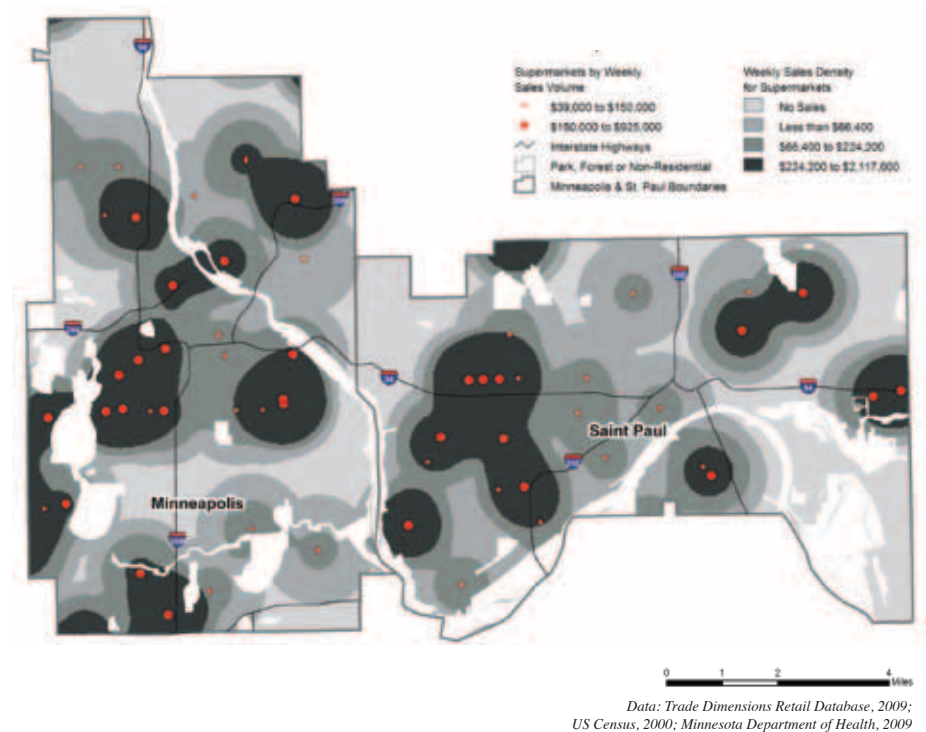
MAP 1A/B: *Weekly Sales Volume for Supermarkets* shows the location of 568 stores throughout Minnesota, including 58 in the Twin Cities, and the weekly sales volume at each store. The smaller red circles represent lower weekly sales volume; the larger red circles represent higher weekly sales volume. The gray shading shows how supermarket sales are distributed. 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 Minnesota are unevenly distributed. Supermarkets are highly concentrated along major highways and in wealthier suburban

1A: Weekly Sales Volume for Supermarkets in Minnesota



1B: Weekly Sales Volume for Supermarkets in the Twin Cities



areas, while many small towns and rural communities across Minnesota 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 the Twin Cities and the concentration of sales across the cities. Areas with the highest concentration of supermarkets and supermarket sales include Calhoun Isle, Central, portions of Southwest, and the northern half of Longfellow in Minneapolis and Hamline-Midway, Macalester-Groveland, Union Park and Highland Park in Saint Paul. Areas with the fewest supermarkets include North Minneapolis, University,

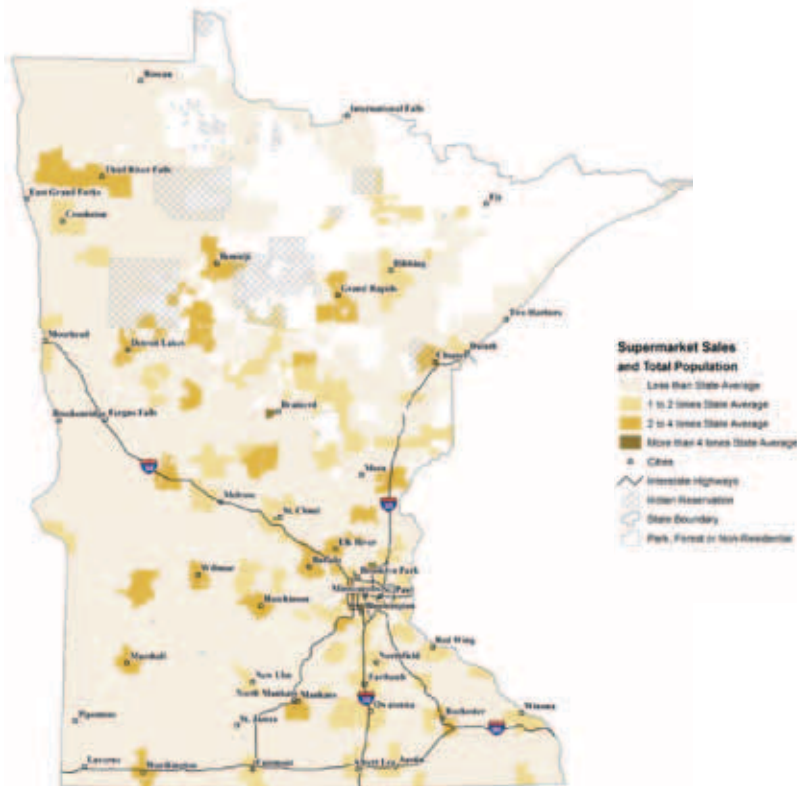
Powderhorn, Phillips, and Nokomis in Minneapolis and Thomas-Dale/Frogtown, Dayton's Bluff, North End, Summit-University and St. Anthony Park in Saint Paul.

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

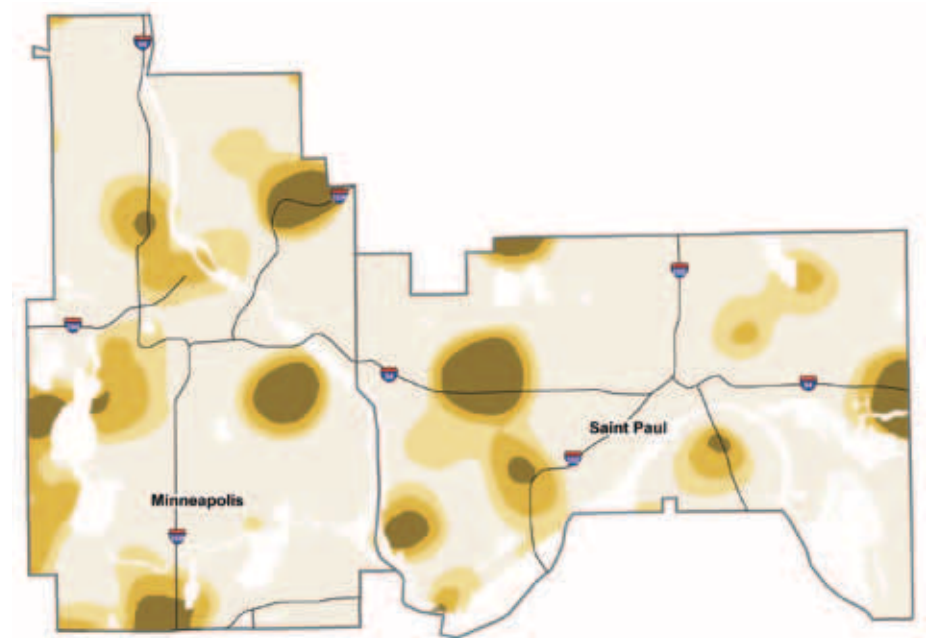
average supermarket sales relative to total population are shown in yellow and brown tones. In these communities, people are either spending more than average in supermarkets, as might be the case in higher-income communities, or more people are buying groceries in these communities than the number of people who live there, indicating that people are traveling from outside the area to shop there.

Areas with the fewest supermarkets include North Minneapolis, University, Powderhorn, Phillips and Nokomis in Minneapolis and Thomas-Dale/Frogtown, Dayton's Bluff, North End, Summit-University and St. Anthony Park in Saint Paul.

2A: Supermarket Sales and Total Population in Minnesota



2B: Supermarket Sales and Total Population in the Twin Cities



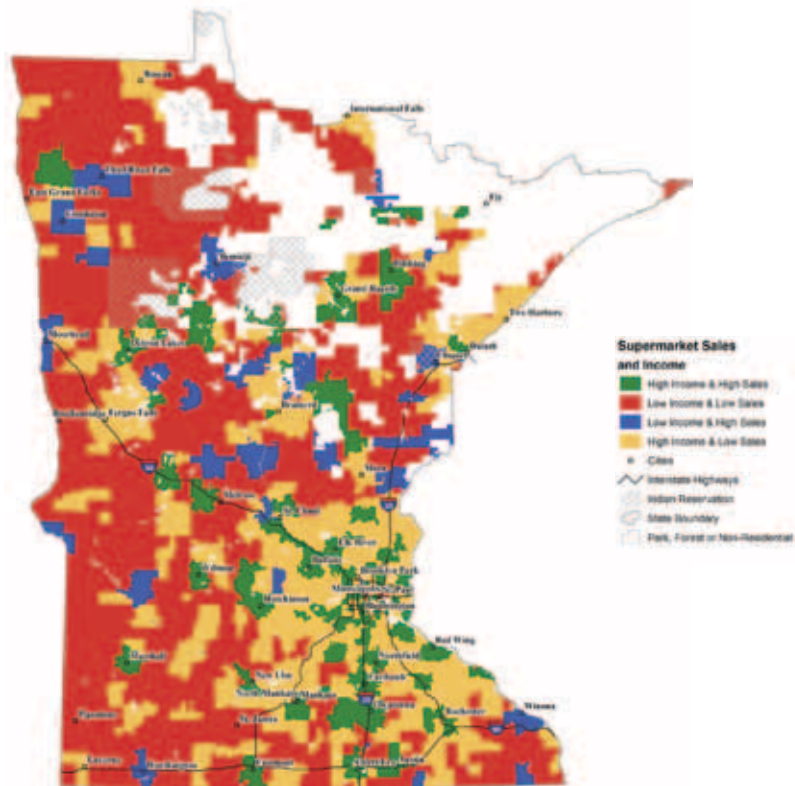
KEY FINDINGS

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

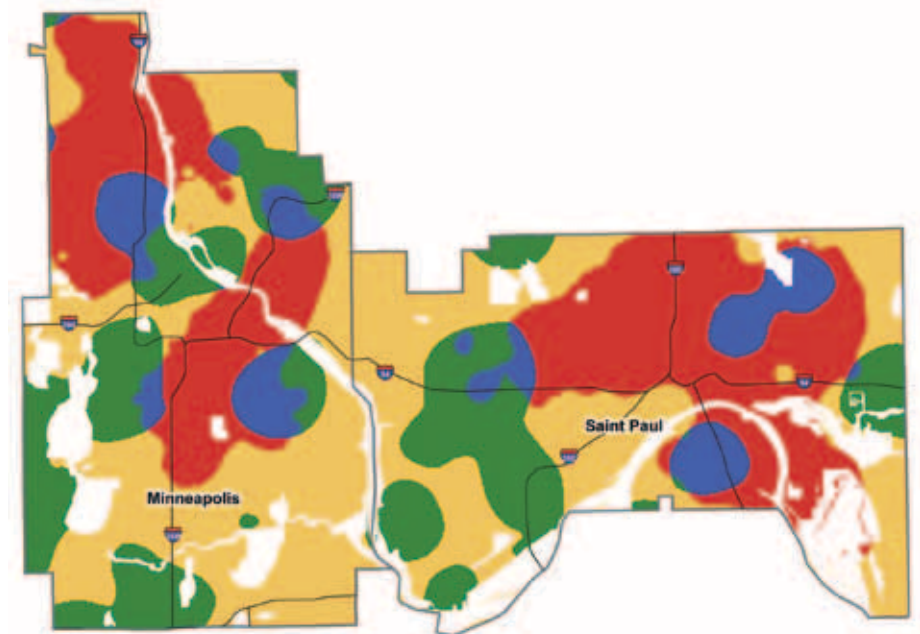
- Minnesota has fewer supermarkets per capita than most states; compared to national averages, Minnesota has 40 too few supermarkets.¹⁷ This shortage of supermarkets particularly impacts lower-income residents with limited resources to obtain an adequate diet.

MAP 3A/B: *Supermarket Sales and Income* shows the distribution of supermarket sales and the distribution of income throughout the state and Twin Cities. Higher-income 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 Minnesota



3B: Supermarket Sales and Income in the Twin Cities



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

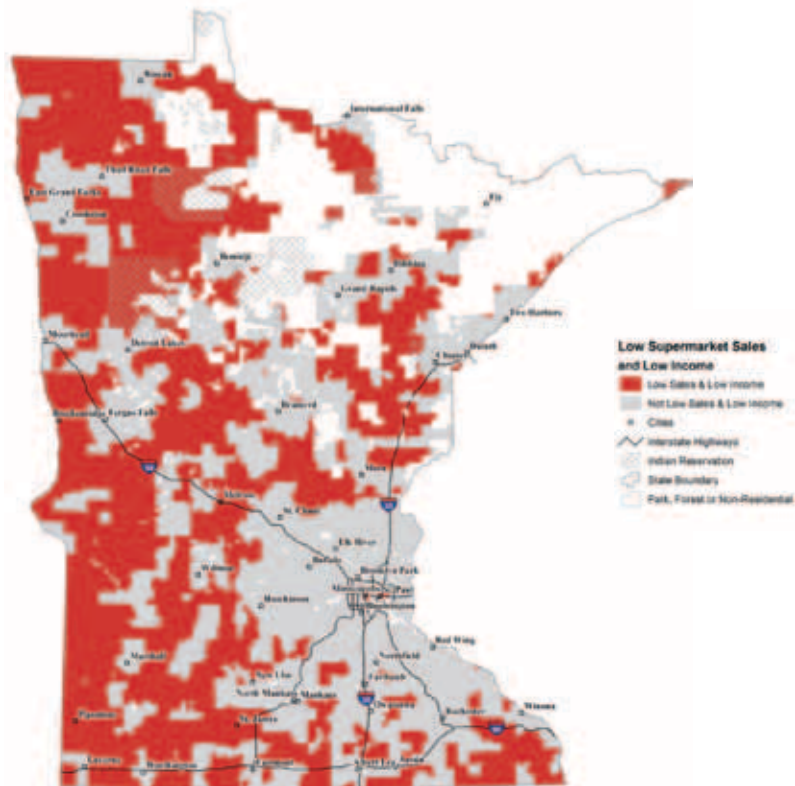
MAP 4A/B: *Low Supermarket Sales and Low Income* further highlights areas with low supermarket sales because there are few to no supermarkets located there. Since income is also lower in these areas, families face more difficulty traveling to the areas where supermarkets are concentrated, especially when public transit is not accessible or convenient. Nearly 900,000 Minnesota residents, including over 200,000 children, live in these underserved communities.

Large areas of Greater Minnesota are underserved by supermarkets, including many small towns and rural communities. In Minneapolis, underserved neighborhoods are concentrated in North Minneapolis, Phillips, and Powderhorn, and also include Cedar Riverside,

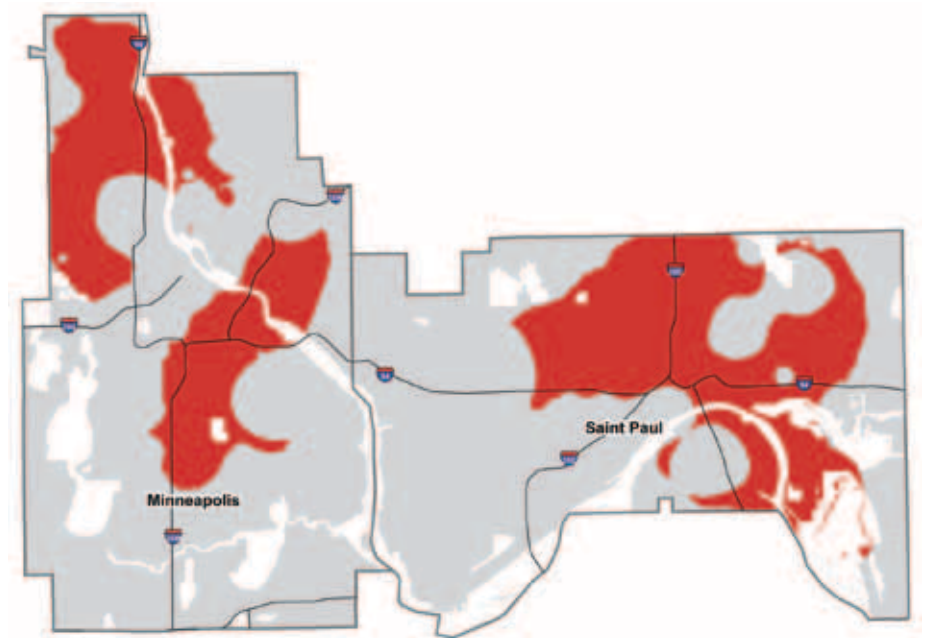
Elliott Park, Downtown East, Marcy Holmes and University. In Saint Paul, communities that are not well-served are located north and east of downtown Saint Paul, including sections of Thomas-Dale/Frogtown, North End, Payne-Phalen, Dayton's Bluff, the West Side and Battle Creek.

Lower-income communities with insufficient supermarket access can be found in cities and towns across the state. Nearly 900,000 Minnesota residents, including over 200,000 children, live in these underserved areas.

4A: Low Supermarket Sales and Low Income in Minnesota



4B: Low Supermarket Sales and Low Income in the Twin Cities



KEY FINDINGS

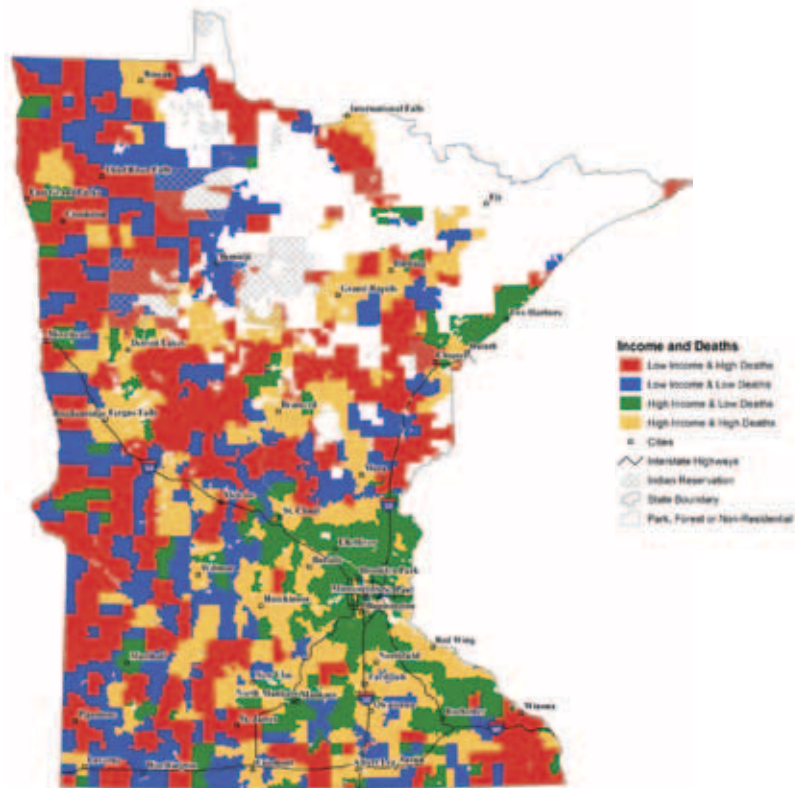
There is a connection between lack of supermarkets and diet-related disease.

- 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.¹⁸

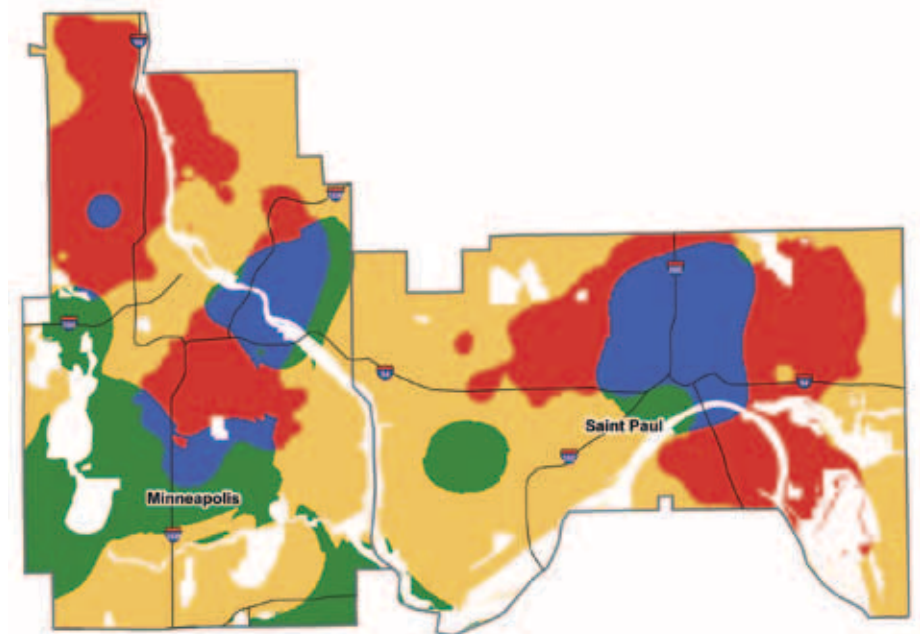
One study, for example, found lower body mass index among adolescents who live near a supermarket.¹⁹ Another documented that fruit and vegetable intake increases as much as 32 percent for each additional supermarket in a community.²⁰

MAP 5A/B: *Income and Diet-Related Deaths* shows diet-related mortality data by income in Minnesota and the Twin Cities. The red areas indicate a higher than average rate of diet-related deaths occurring in lower-income 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.

5A: Income and Diet-Related Deaths in Minnesota



5B: Income and Diet-Related Deaths in the Twin Cities



In addition to the health consequences, treating diet-related diseases, such as hypertension, obesity and diabetes, is costly for families and communities. In 2004, Minnesota spent an estimated \$1.3 billion to treat obesity-related diseases. According to Blue Cross Blue Shield of Minnesota, the cost of treating obesity-related diseases is estimated to rise to \$5 billion annually by 2020 if steps are not taken to slow the rate of obesity. In 2009, heart disease and stroke were among the top four leading causes of death in Minnesota,²¹ and overweight or obese adults are significantly more likely to suffer from these conditions.²² Diet-related deaths are associated with many factors, including the lack of access to a nutritionally adequate diet.

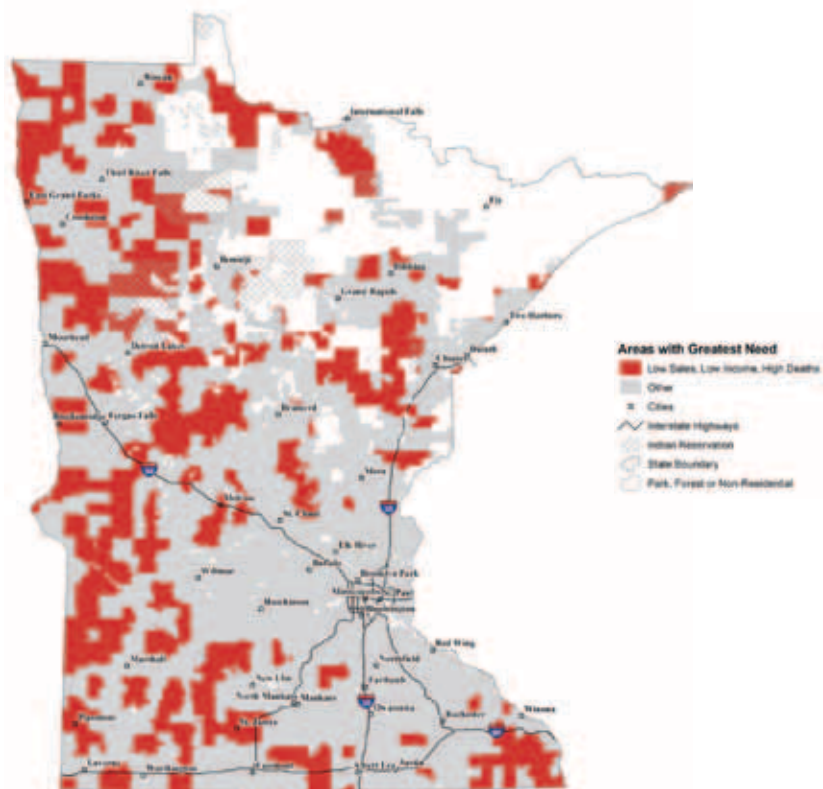
MAP 6A/B: *Areas with Greatest Need* displays lower-income communities with low access to supermarkets and a high number of diet-related deaths. These areas have the greatest need for more supermarkets.

To provide healthy, affordable foods in these communities and help address the high rates of obesity and other diet-related diseases, Minnesota should encourage new supermarket development in lower-income areas where there are few or no supermarkets.

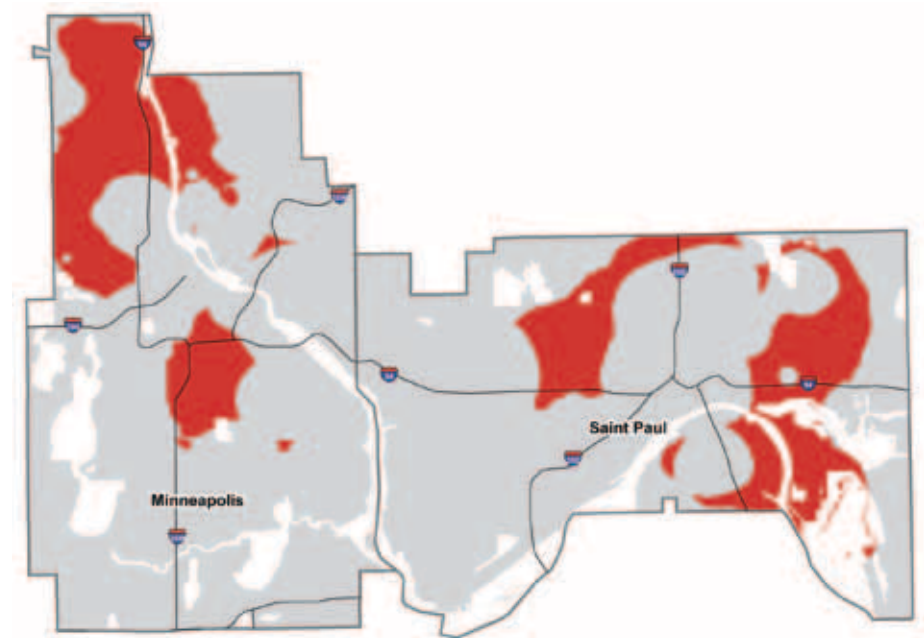
Increasing the availability of healthy, affordable foods in neighborhoods with high rates of diet-related diseases does not guarantee a reduction in their incidence. However, leading public health experts, including the Centers for Disease Control and Prevention and the Institute of Medicine, agree that it is a critical component of the fight against obesity.²³ Furthermore, the White House Obesity Task Force recently highlighted the importance of increasing access to healthy, affordable foods as one of its key recommendations.²⁴

Leading public health experts agree that increasing access to supermarkets in underserved communities is a critical component in the fight against obesity.

6A: Areas with Greatest Need in Minnesota



6B: Areas with Greatest Need in the Twin Cities



CONCLUSION

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

When communities lack access to healthy foods, adults and children have to travel long distances to purchase nutritious foods or rely on corner and convenience stores, with higher prices and often lower-quality 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.²⁵

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.²⁶

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 Minnesota annually.

Through mapping, this study shows that many lower-income communities in Minnesota have both poor supermarket access and a high incidence of diet-related deaths. This statewide problem is reflected at the local level in the Twin Cities, 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

Minnesota 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 Minnesota:

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 Minnesota statewide analysis was at the ZIP code level of geography and is prefixed by A); all Minneapolis-Saint Paul (Twin Cities) 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 568 supermarkets in Minnesota with an aggregate weekly sales volume of \$185,392,000, and 58 supermarkets in Minneapolis-Saint Paul with an aggregate weekly sales volume of \$16,520,000. 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) ZIP code and B) raster grid into the four categories shown in Map 1: Weekly Sales Volume for Supermarkets.

POPULATION

Population data for the state of Minnesota by ZIP code and Minneapolis-Saint Paul by census tract was retrieved from the US Census Bureau website (www.census.gov) for the year 2000 decennial census (Minnesota total of 4,919,479 people; Minneapolis-Saint Paul total of 669,769 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 ZIP code. The result was then divided by \$37.69 (the statewide ratio of sales to population: $\$185,392,000/4,919,479$) to create an odds ratio for weekly supermarket sales per person for Minnesota. B) The density of weekly sales volume raster was divided by the density of total population raster. The result was then divided by \$24.67 (the Twin Cities ratio of sales to population: $\$16,520,000/669,769$) to create a “sales” odds ratio for weekly supermarket sales per person. An odds ratio of 1 is equivalent to the statewide/Twin Cities rate. Anything below 1 is below the statewide/Twin Cities rate. An odds ratio of 2 means the rate is twice the statewide/Twin Cities rate. This is used for Map 2: Supermarket Sales and Total Population.

INCOME

Median household income (Minnesota: \$47,111) was multiplied by the number of households, and the result was divided by total population to create an average per capita income (Minnesota: \$18,148.53) for the state of Minnesota. A) Local per capita income by ZIP code was divided by this number giving an “income” 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 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 Minnesota Department of Health provided mortality data for the specified list of ICD-10 codes for the year 2009. A) A total of 16,320 diet-related deaths were mapped at the ZIP code level for Minnesota, and B) a total of 1,600 deaths were mapped at the ZIP code level for Minneapolis-Saint Paul. The data were summarized based upon the ZIP code number to obtain a count of diet-related deaths per ZIP code.

DIET-RELATED DEATHS AND POPULATION

The total number of deaths attributed to each ZIP code was divided by the total population of that area. This result was divided by the statewide/Twin Cities ratio of diet-related deaths to total population (Minnesota: $16,320/4,919,479 = 0.003317$, or 33 diet-related deaths per 10,000 people; Minneapolis-Saint Paul: $1,600/669,769 = 0.002389$, or 24 diet-related deaths per 10,000 people) to calculate an odds ratio. A) A new binary field was created to store whether the ZIP code had a “deaths” odds ratio above or below the statewide rate. B) The odds ratio, assigned to the ZIP code centroid, was used to interpolate a grid, which was then reclassified to yield two distinct values, those below and those above the Twin Cities 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, 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 ZIP code as the product of “deaths” odds and the “low supermarket sales and low income” variable. B) The two reclassified rasters of 1) “deaths” and 2) “low supermarket sales and low income” 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

- 1 Per capita figures derived from: Trade Dimensions International, Inc. (2009). *2009 Marketing Guidebook*. Wilton, CT; US Census Bureau (2000).
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- 16 Trust for America's Health (2011). *F as in Fat: How Obesity Threatens America's Future 2011*. Available at: <http://healthyamericans.org/reports/obesity2011/>
- 17 Per capita figures derived from: Trade Dimensions International, Inc. (2009). *2009 Marketing Guidebook*. Wilton, CT; US Census Bureau (2000).
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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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