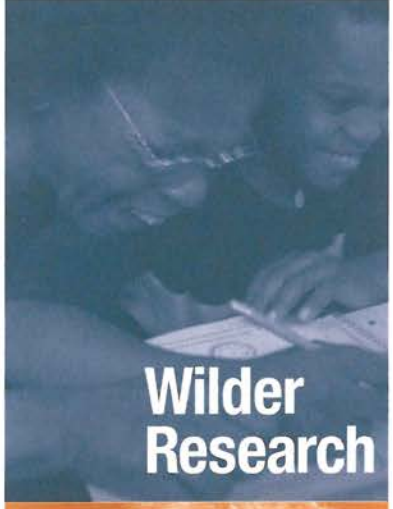
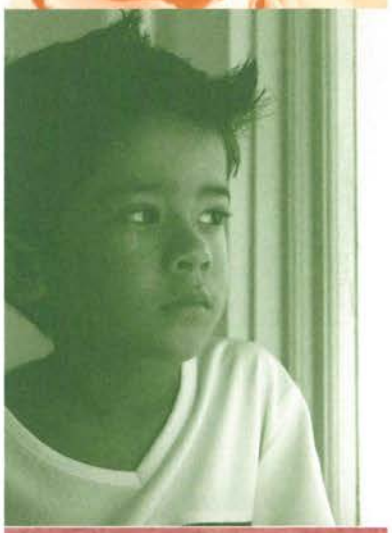
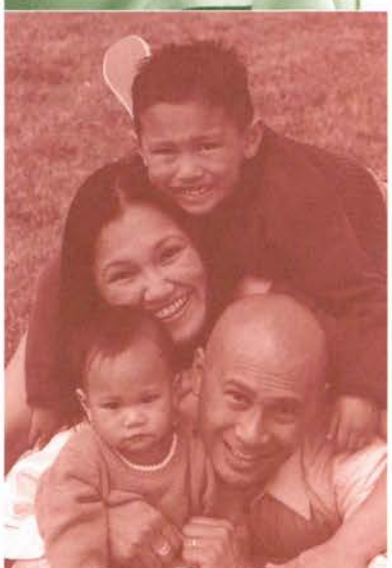






Health inequities in the Twin Cities

An update to "The unequal distribution of health in the Twin Cities"

This report was commissioned by the Blue Cross and Blue Shield of Minnesota Foundation

M A Y 2 0 1 2

Health inequities in the Twin Cities

An update to "The unequal distribution of health in the Twin Cities"

This report was commissioned by the Blue Cross and Blue Shield of Minnesota Foundation

May 2012

Prepared by:
Melanie Ferris

Wilder Research
451 Lexington Parkway North
Saint Paul, Minnesota 55104
651-280-2700
www.wilderresearch.org

Contents

Figures

Foreword

Blue Cross and Blue Shield of Minnesota and our Foundation are committed to improving community conditions that affect the health of children and families. Part of this important work involves keeping a finger on the pulse of changes in health equity in our region — changes that signal progress or identify challenges. The examination of health equity helps us understand the impact of factors such as income, neighborhood, race and education on health. To truly create positive change in our region, a strong grasp of the current reality is needed.

That's why we commissioned a health inequities study in 2010 and are following up with new data and insights in 2012. As you'll see in the report and the executive summary, the news is both heartening and foreboding. Certain gaps are narrowing while others persist. And because of our country's economic downturn, we are seeing more widespread fiscal challenges across the region.

It's clear that there is much work to be done when it comes to health equity in the Twin Cities area, and we're determined to be part of the solution. Last year we added a full-time position with the Foundation to focus solely on health equity. We also attended a health equity conference sponsored by PolicyLink, and helped fund a delegation of 150 from Minnesota, where we learned more about "America's Tomorrow: Equity is the Superior Growth Model." And we are co-funding (with The McKnight Foundation) a study to obtain statewide data on life expectancy and mortality with a goal of developing policy recommendations for our state and region.

We're pleased to have entered into a collaborative effort with the Robert Wood Johnson Foundation and The Pew Charitable Trusts to fund and implement health impact assessments in Minnesota as part of the Health Impact Project. Health impact assessments are studies that can help policy makers and community members better understand the potential health impacts of policy proposals, programs or projects in non-health sectors such as agriculture, energy or education.

This is critical work for the ongoing health and vitality of the Twin Cities area, and we appreciate the collaborative nature of creating needed change. It takes dedicated people from business, community, government, health care and more to truly make a difference.

Our hope is that this updated report will give everyone a new sense of reality and urgency when it comes to health equity and its impact on the overall quality of life in our region.

Ken Burdick, President and CEO
Blue Cross and Blue Shield of Minnesota Board Chair
Blue Cross and Blue Shield of Minnesota Foundation

Carolyn Link, Executive Director
Blue Cross and Blue Shield of Minnesota Foundation

Summary of key findings

In 2010, the Blue Cross and Blue Shield of Minnesota Foundation commissioned a report called *The Unequal Distribution of Health in the Twin Cities.* Wilder Research used 2000 Census data to look at the influence of race, income, education and neighborhood conditions on health outcomes. This report found that, among other things:

- An 8-year difference in average life expectancy exists between residents living in our region's highest income areas and residents living in our region's lowest income areas.
- Overall, poorer health outcomes were tied to both poverty and lower levels of education.
- Average life expectancy varied widely by race, from 83 years for Asians to 61.5 years for American Indians.

These findings suggested that in our region, just as in other places, social determinants – the economic and social factors that influence the neighborhood conditions in which we live, work and play – are strongly connected to our health and contribute to health inequities. This updated report uses the most recent census data available to look at changes in health inequities in our region since 2000 and highlight recent demographic trends that offer both opportunity and challenges down the road.

Reducing health inequities continues to be an important issue if we are to ensure that all people reach their full health potential. The updated report found that since 2000:

- The gap in life expectancy rates between the most and least affluent neighborhoods in our region has narrowed, yet children born in the highest income areas are still expected to live six years longer on average than those born into the lowest income areas.
- Poorer health outcomes continue to be tied to both poverty and lower levels of education. While life expectancy has generally improved throughout the region, the greatest increases in life expectancy were made in poorer neighborhoods. Worsening socioeconomic conditions in our region may threaten these gains.
- Age-adjusted mortality rates improved among all racial/ethnic groups except U.S.-born African American residents. In addition, considerable differences in health outcomes remain between different racial and ethnic groups. Mortality rates among American Indian and U.S.-born African American residents are notably higher than the regional average.

In short, both encouraging and discouraging changes in health outcomes have occurred over time, but the underlying factors that influence these health outcomes remain the same. In our region, we continue to see that neighborhood, income, education and race all matter to health.

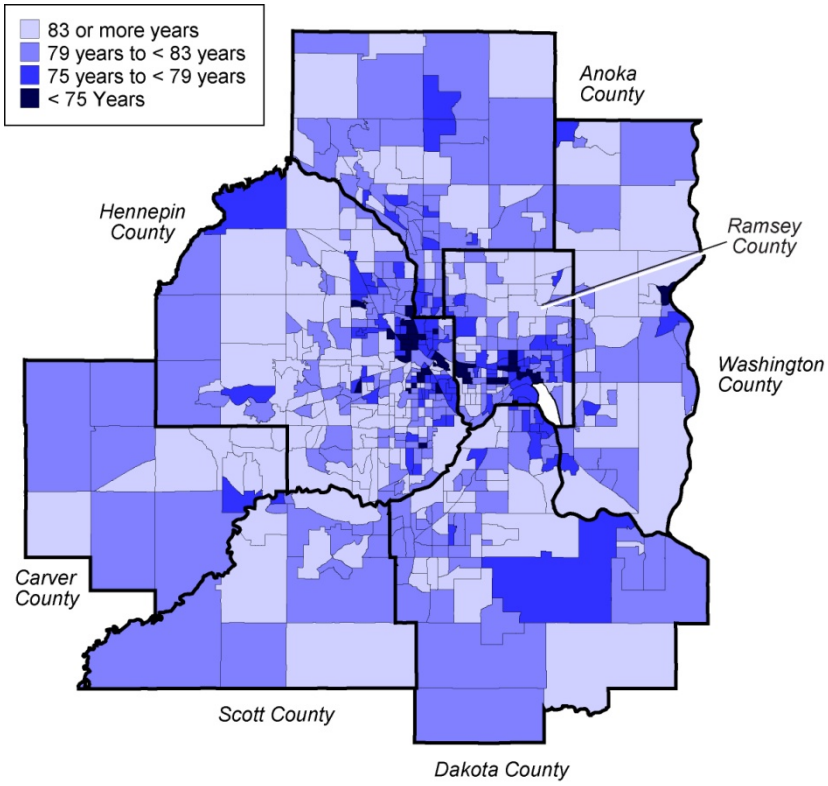
Key findings

Overall, Twin Cities residents are living longer. The average life expectancy in our region is 81 years, higher than the national average of 76.5. Between 2000 and 2007, average life expectancy in our region increased just over 1.5 years, similar to national averages.

In our region, place, income, education and race all matter to health.

Where you live matters. Neighborhoods with the longest life expectancies tend to be located in more affluent neighborhoods located in second- and third-ring suburban communities. Neighborhoods with the shortest life expectancies continue to be located predominantly in the central cities of Minneapolis/St. Paul – which contain neighborhoods with the lowest incomes and also with the highest concentrations of communities of color.

Life expectancies at birth, by census tract (2007)



Source: Wilder Research analysis of Minnesota Department of Health mortality data (2005-2009) and American Community Survey data (2005-2009).

There are strong associations between socioeconomic status, place and health. Health outcomes tend to be better in areas with higher household incomes, less concentrated poverty

and higher levels of education. When we compared life expectancies between groups of neighborhoods in our region, we found:

- Children born into neighborhoods with the lowest average household incomes (less than $35,000) have a life expectancy of 76 years, compared to 84 years for children born into more affluent neighborhoods with average annual household incomes of $75,000 or more.

- Life expectancy for children born in federal poverty areas (meaning more than 20 percent of residents lived in poverty) was 77 years, compared to 83 years for children born into neighborhoods with the lowest rates of poverty.

- Similarly, average life expectancy was 77 years for children born into neighborhoods with the fewest adults with a post-secondary education (a bachelor's degree or higher), six years less than for children in the region's most educated neighborhoods.

The gap in life expectancies between the most and least affluent communities in our region may have narrowed, but health inequities persist. Life expectancies improved across the region, with data suggesting greater gains occurring in the least affluent neighborhoods. While this change is positive, children born into neighborhoods with the highest concentrations of poverty are still expected to live an average of 6.6 years less than those born into neighborhoods with the lowest poverty rates. Similar inequities are found when comparisons are made based on other measures of socioeconomic status (median household income and educational attainment).

Life expectancy by poverty rate group of census tract neighborhoods (2000, 2007)

Source: Wilder Research analysis of Minnesota Department of Health (mortality data 1998-2002, 2005-2009), U.S. Census Bureau 2000 and American Community Survey 2005-2009

Mortality rates for American Indian and African American (U.S.-born) residents are much higher than the average of any other racial/ethnic group and for all Twin Cities residents combined. In 2007, the mortality rates for African American (U.S.–born) and American Indian residents were 3 – 3.5 times higher than the average for other racial and ethnic groups.

Mortality rates improved among most, though not all, racial/ethnic groups. While age-adjusted mortality rates improved overall and for most racial/ethnic groups, this measure of health was slightly worse for African American (U.S.-born) residents in 2007, compared to 2000.

Changes in age-adjusted mortality rates per 100,000 residents, by race/ethnicity (2000, 2007)

	2000	2007	% change
All	278	244	-12%
African American (foreign-born)	375	199	-47%
Asian (not Southeast Asian)	183	130	-30%
American Indian	1123	869	-23%
Southeast Asian (foreign-born)	272	243	-11%
White (non-Hispanic)	208	197	-13%
Hispanic (any race)	208	197	-5%
African American (U.S.-born)	682	701	+3%

** Age-standardized deaths per 100,000, among the population age 25-64 during the years 1998-2002 and 2005-09.*

Source: Minnesota Department of Health (mortality rates calculated by Wilder Research)

Note: Southeast Asian (foreign-born) residents include immigrants/refugees from the following counties: Cambodia, Indonesia, Laos, Malaysia, Philippines, Singapore, Thailand and Vietnam.

Economic and demographic changes in our region may impact future health outcomes

Worsening socioeconomic conditions threaten gains made in reducing health inequities. Over the past decade (2000-2010), our region has experienced growing economic hardship:

- The percentage of residents living below the poverty level increased from 7 percent to 11 percent and the median household income in our region has decreased nearly $9,000.
- In 2010, over one-third of households were "housing cost-burdened" — meaning they paid 30 percent or more of their household income for housing costs — compared with 24 percent in 2000.
- Three-quarters of residents (74%) were employed in 2010, a drop from 80 percent in 2000.

Poorer socioeconomic conditions may limit resources available in neighborhoods, lead to reductions in health care coverage and change the choices families and individuals make about core health habits, such as food and exercise. However, the long-term impact of these changes on neighborhood infrastructure and overall health may not be realized until years from now.

Large demographic shifts have also occurred, leading to opportunities and challenges. The Twin Cities region is becoming increasingly culturally diverse and is home to many immigrant populations. In 2010, 24 percent of residents were people of color, an increase from 17 percent one decade earlier. By 2035, it is projected over one-third of residents will be people of color. Increased cultural diversity strengthens our region's workforce and enriches our communities. Yet, these trends contribute to a growing sense of urgency to fully understand and modify the underlying factors that contribute to racial health inequities in the region.

At the same time, our region faces the challenges of providing care to a markedly aging population. By 2030 the number of residents age 65 or older is expected to double. Additional state expenditures will be needed to support their care.

Where people live, work and play influences overall health

Social determinants of health refer to a range of complex and overlapping social and economic factors in communities, including community safety, features of the built environment, access to resources and services, social support and racial discrimination. In the report supplement, published as an appendix section to the full report, we explore this issue further by describing how poverty is related to differential access to healthy foods, opportunities for exercise and social connections.

In many ways, our observations about the relationships between place, income, race and health are not new. Over one hundred years ago, African American sociologist W.E.B. Du Bois observed that the racial disparities in health among African American residents living in Philadelphia were the result of the "vastly different conditions" under which African American and white residents lived. Yet, our nation tends to focus its resources and efforts on strategies that fall into the medical model of treating disease rather than focusing on underlying social inequalities and neighborhood conditions that contribute to morbidity and mortality.

As we concluded in our 2010 report, reducing health inequities is an issue of social justice. Intentional and coordinated efforts, done in partnership with community residents, are needed in order to understand the root causes of health inequities in local communities and identify effective, creative solutions to modify the underlying societal and economic factors that influence health.

Health inequities in the Twin Cities region

> Where systematic differences in health are judged to be avoidable by reasonable action they are, quite simply, unfair. It is this that we label health inequity.
> —World Health Organization, 2008

Minnesota is considered to be one of the nation's healthiest states, yet our first report, *The Unequal Distribution of Health in the Twin Cities,* found striking differences in health outcomes among residents in our region. We refer to these differences as "health inequities" to indicate that these differences are largely attributable to underlying unjust and avoidable social and economic factors that influence policies and shape the neighborhood conditions in which people live, work and play.

However, addressing these factors – called social determinants of health – requires much more than simply increasing access to health care. A growing body of research concludes that eliminating health inequities can only occur by addressing the economic, social and educational policies that shape neighborhood conditions and influence health outcomes. In this report, we set out to explore whether health inequities in our region are narrowing and consider how recent demographic and economic changes to our region may alleviate or exacerbate existing inequities. The report supplement, *Relationships between income and neighborhood conditions,* explores the relationship between socioeconomic status and three neighborhood factors that influence health: access to healthy foods, opportunities for physical activity and social connectedness.

About the measures

This report focuses on two key measures, life expectancy and mortality rates, to examine health inequities in the Twin Cities region. While these measures alone do not fully capture what it means to be healthy, mortality measures are useful in looking at differences in overall health across sub-groups in the community. Life expectancy refers simply to the number of years a child born today can expect to live, if all health conditions remain the same. Age-adjusted mortality rates are described as the number of deaths per 100,000 residents and modified to control for differences in the actual age distribution of sub-populations. This measure is used when populations are too small to calculate valid life expectancies. The mortality data used to calculate these two measures were made available by the Minnesota Department of Health and include a variety of useful demographic information, including the decedent's age, race, area of last residence and place of birth, as well as the underlying cause of death.

For this study, we used the most recent census-tract level demographic data available from the United States Census and American Community Survey to compare patterns and differences in health outcomes by race, income and place over time. Although change are reported between 2000 and 2007, multiple-year pooled data (1998-2002, 2005-2009) are used to calculate reliable estimates at a census-tract level. We also use these sources of data to report recent demographic and economic trends in our region and suggest how these changes may influence health inequities in the future.

Limitations to this report include:

- This study "paints a picture" of how health inequities are changing in our region by comparing life expectancy and mortality rates at two different time points. Additional research is needed to determine whether these changes predict longer-term trends.

- This study does not explore individual-level characteristics or health behaviors. National research has demonstrated neighborhood-level factors, such as median household income, influence health outcomes after controlling for individual factors. However, in this study, we do not know the degree to which resident mobility or other factors contribute to observed changes over time.

- Health outcomes are influenced through a series of events or exposures that occur over the life course. There is not an immediate causal relationship between recent demographic and economic trends in the region and changes in life expectancy during the past decade.

- This report explores differences in neighborhoods using census tract boundaries, which may not reflect how residents themselves define their own neighborhoods.

- This study is intended to describe health inequities in our region, but does not explain which interventions are most effective in reducing health inequities.

Detailed descriptions of methods and limitations are found in the appendix.

Closing the gap: Changes in life expectancy over time

In this report, we build on our earlier work to explore potential differences in life expectancy and mortality rates over time in the Twin Cities. First, we highlight the most current data available to describe health outcomes in our region, and then compare those findings to "update" the 2000 data presented in our initial report.

We're living longer

Residents in the Twin Cities region are living longer than ever before. In 2007:

- The average life expectancy for residents in the Twin Cities metro was 81 years — a 1.5 year increase from 2000.
- The national average life expectancy increased from 76.8 years in 2000 to 77.9 years in 2007 (Aries, 2011).

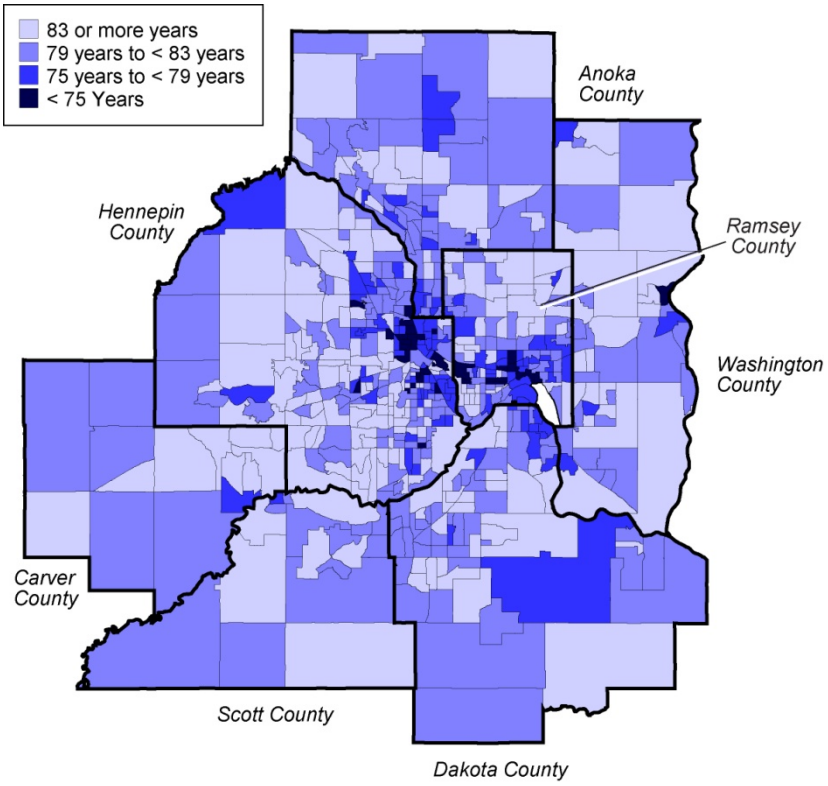
Increases in life expectancy rates are largely attributed to fewer deaths due to key chronic conditions including heart disease, cancer, diabetes and stroke. More effective health care treatment is likely one factor that contributes to these reductions in chronic disease, as do improved screening and other preventive health efforts.

Life expectancy rates vary by neighborhood

When mapped by census tract, average life expectancy rates vary considerably across the region — from 68 to 91 years.

- Many of the neighborhoods with the shortest life expectancy rates are located in the central cities of Minneapolis and St. Paul, though there are suburban communities that also have low average life expectancy rates (Figure 1).
- Neighborhoods with the highest life expectancy rates (85 years and older) tend to be located in the second- and third-ring suburbs, though there are neighborhoods throughout the region where residents live longer.

1. Life expectancies at birth, by census tract (2007)



Source: Wilder Research analysis of Minnesota Department of Health mortality data (2005-2009) and American Community Survey data (2005-2009).

Income and education rates vary by neighborhood

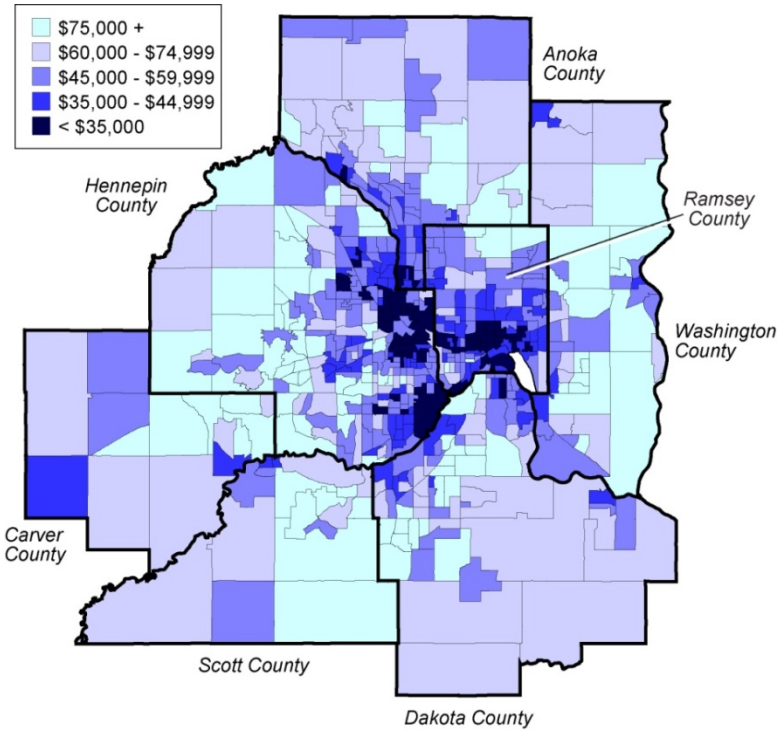
When median household income is mapped by census tract, similar patterns emerge.

- Neighborhoods with the lowest income levels tend to be concentrated in the central cities of Minneapolis and St. Paul and some census tracts of nearby suburban cities (Figures 2, 3).
- Neighborhoods with the highest income levels tend to be concentrated in "second-ring" suburban communities.

Somewhat different patterns emerge when higher and lower concentrations of educational attainment are mapped by neighborhood.

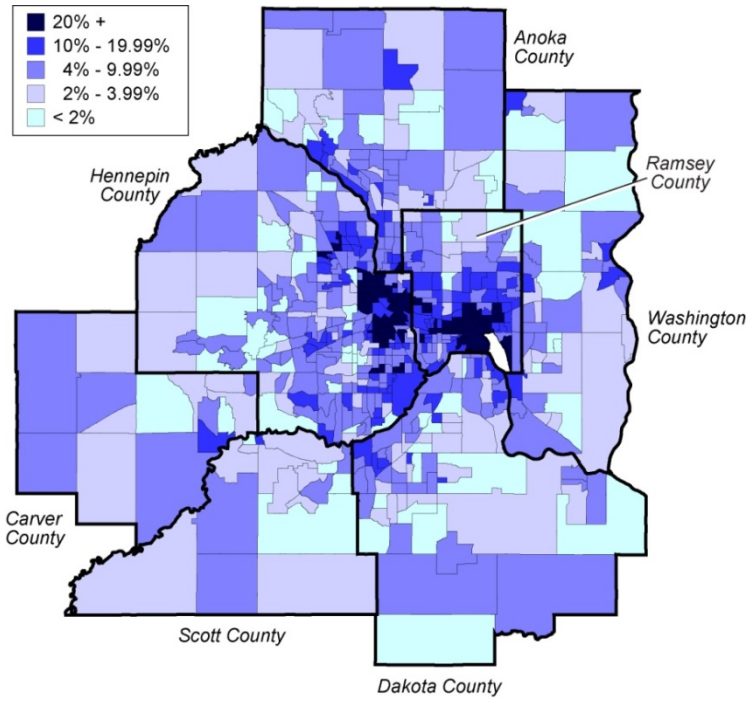
- Many neighborhoods with the smallest percentage of residents with bachelor's degrees are also found in the central cities of Minneapolis and St. Paul.
- Communities in areas of northern Anoka County and western Carver County have relatively few adults with a bachelor's degree (Figure 4).

2. Median household income by census tract (2007)



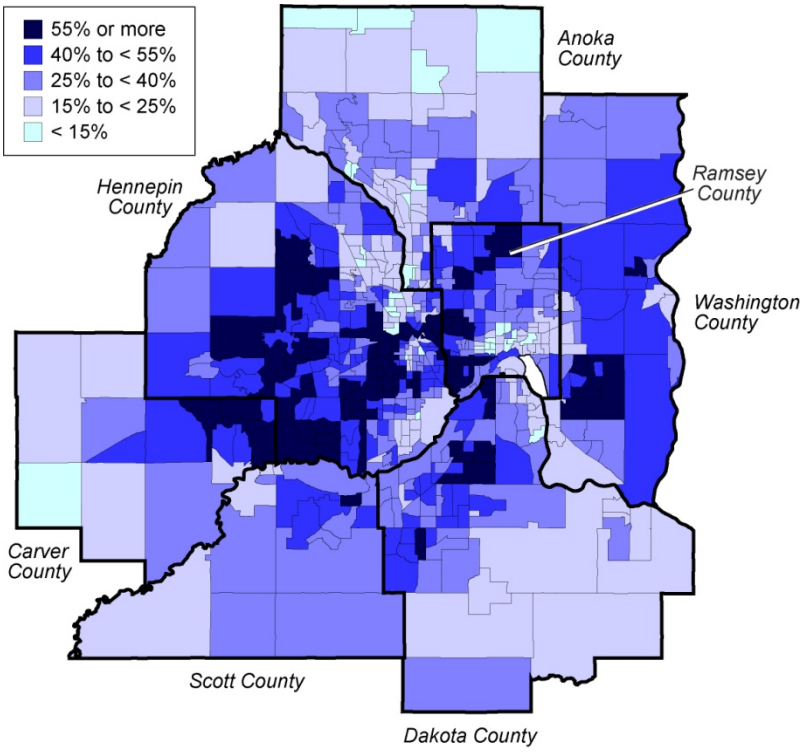
Source: *Wilder Research analysis of American Community Survey data (2005-2009).*

3. Percent of residents living in poverty, by census tract (2007)



Source: *Wilder Research analysis of American Community Survey data (2005-2009).*

4. Adults age 25 or older with a bachelor's degree or higher education (2007)



Source: *Wilder Research analysis of American Community Survey data (2005-2009).*

Changes in life expectancy over time, by socioeconomic status

To see how socioeconomic status impacts health in the Twin Cities, we calculated life expectancies and mortality rates for each census tract based on death certificate data. We then grouped the census tracts according to median income, poverty rate and education attainment. Consistent patterns show that average life expectancy of residents is greater in neighborhoods with higher median incomes, higher levels of education and lower rates of poverty. These patterns – called "social gradients" – were observed in both 2000 and 2007.

In 2007:

- Fourteen percent of the population lived in lower-income neighborhoods with average household incomes of less than $35,000.
- Children born into lower-income neighborhoods have a life expectancy of 76 years, compared to 84 years for children born into more affluent neighborhoods with average annual household incomes of $75,000 or more. (Figure 5).

Although there were still notable health inequities between Twin Cities' neighborhoods in 2007, the data suggest the gap in life expectancy rates based on socioeconomic factors has narrowed nearly one year since 2000.

- Overall, the average life expectancy among residents in top income neighborhoods increased 1.2 years between 2000 and 2007 and 2.1 years among residents of poorest neighborhoods.

Similar changes in life expectancy rates were found in neighborhoods with varying concentrations of poverty.

- In 2007, children born into neighborhoods designated as federal poverty areas had a life expectancy of 77 years, compared to 83 years for children born into neighborhoods with the lowest rates of poverty (Figure 5).

- The gap in life expectancies between neighborhoods with the highest and lowest concentrations of poverty narrowed nearly 1.5 years between 2000 and 2007.

- The average life expectancy among residents in neighborhoods with the highest concentrations of poverty increased 3 years, compared to 1.6 years in areas with the lowest concentrations of poverty.

Educational attainment is often used as a proxy for socioeconomic status in the United States, as it is often associated with earning a higher income. Residents with higher levels of education may also have longer life expectancies because they have greater health literacy, work in safer jobs or have greater access to healthy foods and opportunities for exercise.

Again, when average life expectancies were compared between neighborhoods with the lowest and highest rates of adults (ages 25 or older) with bachelor's degrees:

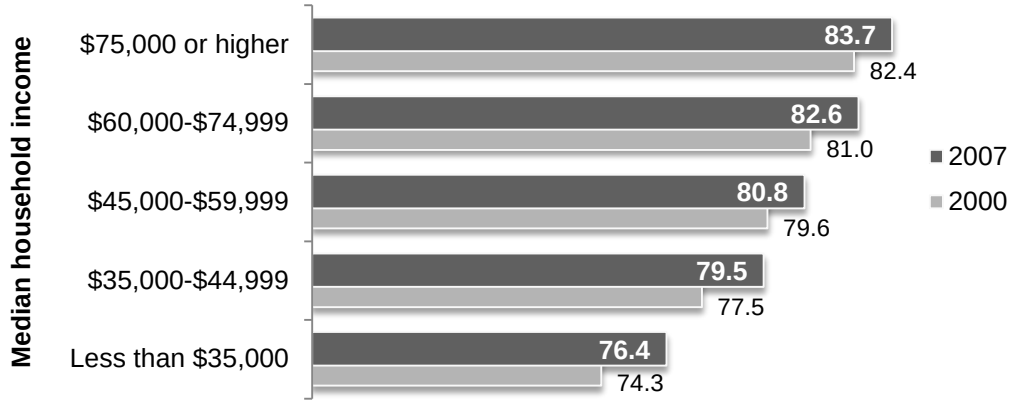
- Average life expectancy was over 6 years less for children born into neighborhoods with lowest levels of educational attainment compared to those with the highest rates in 2007 (Figure 5).

- Between 2000 and 2007, the gap in life expectancies between neighborhoods with the highest and lowest levels of educational attainment narrowed just over 1 year, from 7.3 years difference in 2000 to 6.2 years difference in 2007.

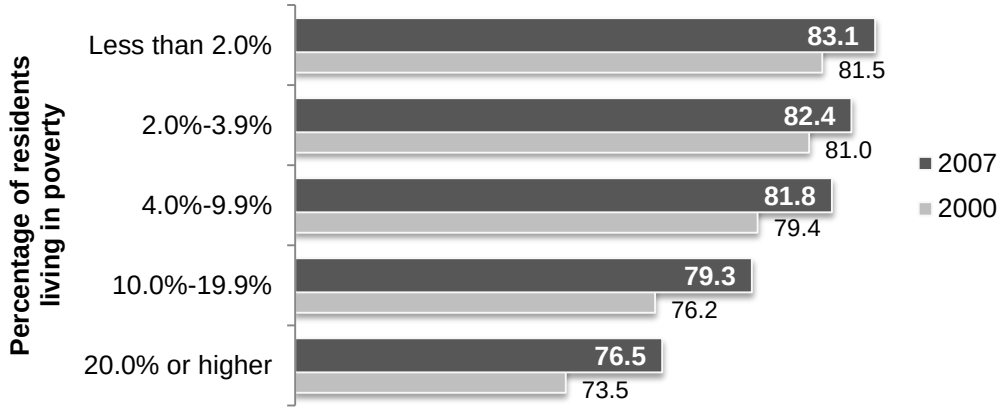
To some degree, we can expect that gains in life expectancy will be greater among populations who had poorer health outcomes, as the life expectancy for residents of our region's most affluent neighborhoods is already quite high. Further, our analyses do not factor in other individual or community factors that influence health. Yet, the trend may be an indication that we are making progress towards a goal of eliminating health inequities.

5. Changes in life expectancy rates by census tract groups (2000, 2007)

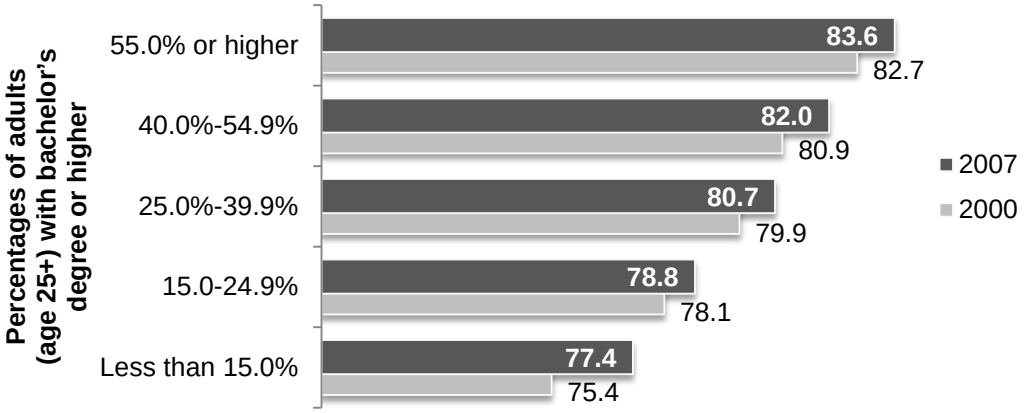
Life expectancy based on median household income



Life expectancy based on poverty rate



Life expectancy based on educational attainment



Source: Wilder Research analysis of Minnesota Department of Health (mortality data 1998-2002, 2005-2009), U.S. Census Bureau 2000 and American Community Survey 2005-2009 (population and educational attainment of adults age 25 and older, median household income, by census tract)

Changes in health outcomes over time, by race

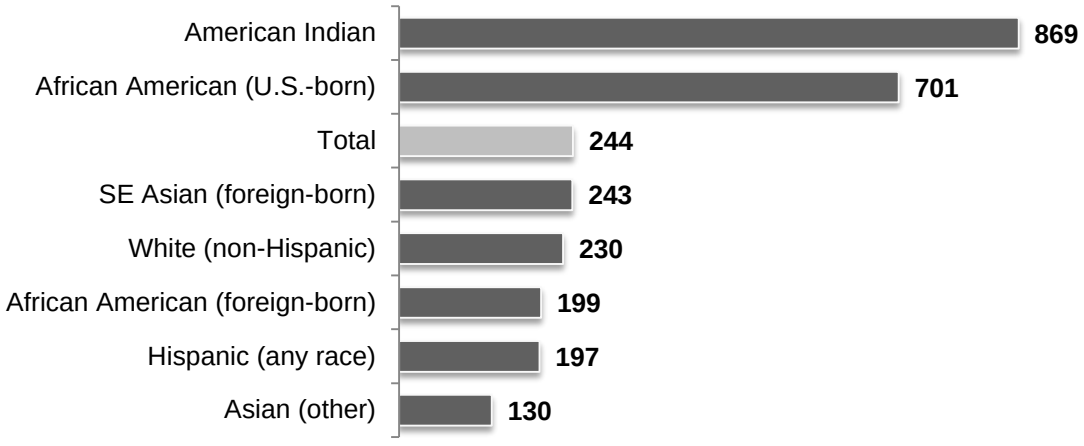
In the Twin Cities region, mortality rates vary widely among different racial and ethnic groups. American Indian and African American residents are more likely to die at earlier ages than residents of other racial or ethnic groups.

- Among adults ages 25-64 in the Twin Cities, the average mortality rate is 244 in 100,000 residents.
- Mortality rates among American Indian and African American (U.S.-born) residents are much worse (869 per 100,000 residents and 701, respectively) (Figure 6).

There is also a striking difference in mortality rates between U.S.-born and foreign-born African American residents.

- The mortality rate for U.S.-born African American residents is over 3.5 times higher than for foreign-born African American residents (869, compared to 199 per 100,000 residents among foreign-born residents).
- In contrast, U.S.-born Asian residents have lower mortality rates than foreign-born Southeast Asian residents (130, compared to 243 among foreign-born residents). This may be due, in part, to the poor health conditions faced by many Southeast Asian refugees coming to the United States from war-torn nations.

6. Mortality rates* by race/ethnicity and nativity, Twin Cities 7-county region



** Age-standardized deaths per 100,000, among the population age 25-64 during the years 2006-2008*

Source: Minnesota Department of Health (mortality rates calculated by Wilder Research)

Cause-of-death rankings can also provide valuable information that could guide intervention efforts. Overall, the three leading causes of death in the Twin Cities region (2006-2008) were cancer, heart disease and stroke. And when cause-of-death rankings are reported by household income category, rankings remain relatively consistent, regardless of income level (appendix figure A2).

Age-adjusted mortality rates improved since 2000 across most racial and ethnic groups, but not all.

- The greatest improvement in mortality rates was among African American, foreign-born residents (a 47% reduction in mortality rates).
- Mortality rates for U.S.-born African American residents worsened slightly during the same time frame (a 3% increase in the mortality rate).

7. Changes in age-adjusted mortality rates* per 100,000 residents, by race/ethnicity (2000, 2007)

	2000	2007	Percent change
All	278	244	- 12%
African American, foreign-born	375	199	- 47%
Asian (other)	185	130	- 30%
American Indian	1123	869	- 23%
Southeast Asian (foreign-born)	272	243	- 11%
White (non-Hispanic)	230	263	- 13%
Hispanic (any race)	208	197	- 5%
African American, U.S.-born	682	701	+ 3%

** Age-standardized deaths per 100,000, among the population age 25-64 during the years 1998-2002 and 2005-09.*

Source: Minnesota Department of Health (mortality rates calculated by Wilder Research)

Note: Southeast Asian (foreign-born) residents include immigrants/refugees from the following countries: Cambodia, Indonesia, Laos, Malaysia, Philippines, Singapore, Thailand and Vietnam.

The intersection of socioeconomic status, race and health

Racial health inequities are heightened by socioeconomic disparities. In the Twin Cities region:

- Residents of color are more likely to live in poverty than white residents (24%, compared to 6% of white residents) and have lower median household incomes (Figure 8).
- There are notable differences across multiple measures of educational attainment.

8. Select demographic, economic and educational characteristics by racial and ethnic group (2010)

				Specific Populations of Color			
	All	White, non-Hispanic	Of Color (all)	African American	American Indian	Asian	Hispanic/ Latino*
Population	2,849,567	2,173,218	676,349	238,723	20,906	184,683	167,558
Median age	36	40	26	27	32	27	25
Median household income	$64,630	$68,743	$43,187	$28,972	$39,326	$62,916	$42,175
Percent in poverty	9%	6%	24%	32%	29%	17%	21%
Percent foreign-born	10%	2%	41%	28%	5%	61%	41%
Home ownership rate	71%	77%	38%	25%	44%	57%	41%
Adults with a bachelor's degree or higher	38%	40%	26%	19%	15%	44%	16%
High school graduation rate	72%	82%	52%	46%	37%	70%	46%
3rd grade reading: proficient	74%	86%	55%	52%	53%	64%	51%

** Of any race.*

Sources: Population=U.S. Census Bureau 2010, Median age = 2010 American Community Survey (ACS); Median income – 2007-09 ACS (from 3-year estimates); Poverty rate = 2007-09 ACS (African American, Asian and Hispanic rates are from the 13-county region and American Indian are from the state of Minnesota); Percent foreign-born = 2010 ACS (7 13-county Twin Cities metro region); Home ownership = 2010 ACS (13-county Twin Cities metro region); Adults with bachelor's degree or higher education = ACS 2010 (13-county Twin Cities metro region; shown for adults age 25 or older); High school graduation rate = Minnesota Department of Education; 3rd grade reading: proficient = Minnesota Department of Education.

Racial health inequities are more pronounced in lower-income communities, but persist regardless of income level.

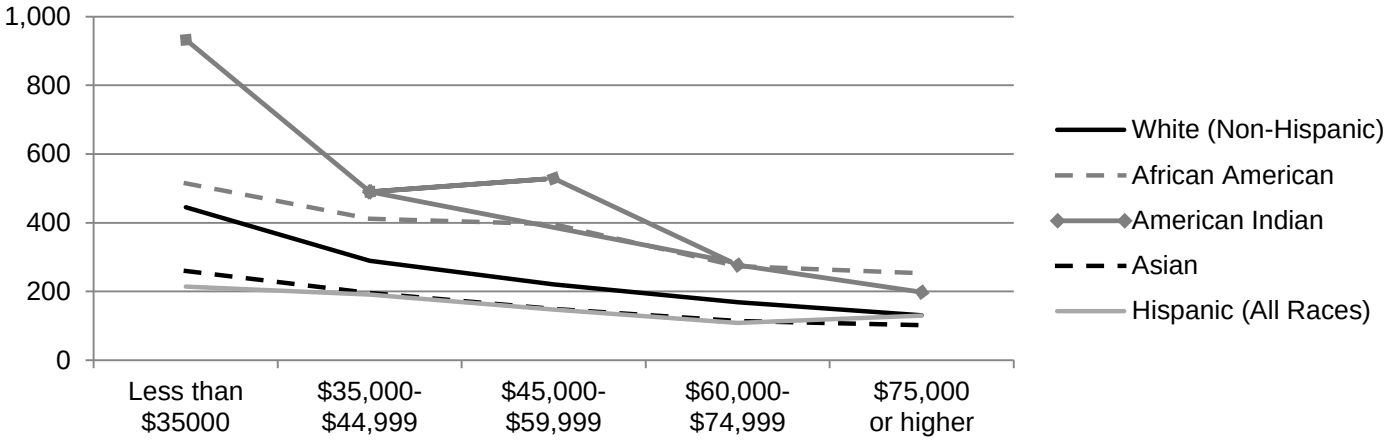
- Within the lowest income neighborhoods of the Twin Cities, the mortality rates per 100,000 residents are much worse for American Indian (933) residents than for any other racial/ethnic group, including African American (515), white (445), Asian (260) and Hispanic (241) residents (Figure 9).

- Across all racial/ethnic groups, mortality rates generally improve as the neighborhood median household income rises.

- Although the mortality rate among American Indian residents is still 2.5 times greater than Asian residents within the highest-income earning neighborhoods, this is a notable

reduction from mortality rates 4.3 times greater for American Indian residents in the lowest-income earning neighborhoods.

9. Mortality rates* by race and ethnicity within median household income groups of census tracts (2007)



** Deaths per 100,000 for those age 25-64.*

Sources: Minnesota Department of Health (mortality data 2005-2009), American Community Survey (2005-2009 population and median household income by census tract).

To some extent, the observed racial health inequities that persist across income groups reflect limitations in how socioeconomic status is measured and reported across population groups (Braveman, et al., 2005). Individual wealth, for example, is seldom measured in studies exploring racial disparities, but may be an important factor explaining overall differences in the socioeconomic status of different population groups.

There are also a number of individual and community level factors that contribute to racial and ethnic health inequities, including persistent differences in access to and quality of medical care, the living and working conditions that influence health and the direct and indirect impacts of racism (Braveman, et al., 2011).

Looking ahead: Opportunities and challenges in reducing health inequities

Exploring changes in life expectancy rates across population groups can help us know whether we are on "the right track" in improving health outcomes and reducing health inequities in the Twin Cities metro region. However, it is also useful to consider how recent demographic and economic changes in the region may influence health outcomes in the future.

This report explores changes in both health outcomes and demographic characteristics over the same time period, but readers should not assume there is a real-time association between the two. While increased poverty, for example, may result in reductions in neighborhood resources and health outcomes, these changes do not occur simultaneously. There is a not a good model available to determine how far we must look ahead to see the future impacts of current community economic and demographic changes. We can suggest, but not accurately predict, how these changes may influence future health outcomes.

Recent economic changes

Recent economic changes will likely pose challenges to reducing health inequities in the future. A downturn in the economy can impact the health of individuals, as is the case when loss of employment leads to loss of health care insurance coverage. A poor economy can also lead to negative changes in neighborhood conditions when fewer dollars are available to support community infrastructure.

Lower levels of income and employment

Today, more residents of the Twin Cities metro area are facing greater financial hardship. In all areas except attainment of a bachelor's degree, economic indicators have worsened in the region between 2000 and 2010.

- The percentage of residents living below the poverty level (currently $22,113 for a family of four) increased from 6.9 percent in 2000 to11.3 percent in 2010.
- The number of adults working has decreased and housing has become increasingly unaffordable for a number of households. Those paying 30 percent or more of their income for monthly housing costs have increased from 24 percent of households in 2000 to nearly 36 percent in 2010.

- Real median household incomes have decreased roughly $9,000, from $71,091 in 2000 to $62,352 in 2010 (Figure 10).

10. Changes in selected Twin Cities region economic indicators

	2000	Most recent data
Real median household income* (in 2010 inflation-adjusted dollars)	$71,091	$62,352 (2010)
Proportion of adults working	80.2%	74.1% (2010)
Percent (age 25+) with a bachelor's degree or higher	34.8%	39.8% (2010)
Share of households paying 30 percent or more of income for housing costs	23.9%	35.5% (2010)
Homeownership rate	71.4%	69.8% (2010)
Homelessness rate per 10,000 (count)	21.8	22.7 (2009)

**Figures for median household income were collected from the 2000 decennial census, which asked about income during 1999.*

Sources: U.S. Census Bureau, 2000; 2010 American Community Survey (13-county Twin Cities metro region)

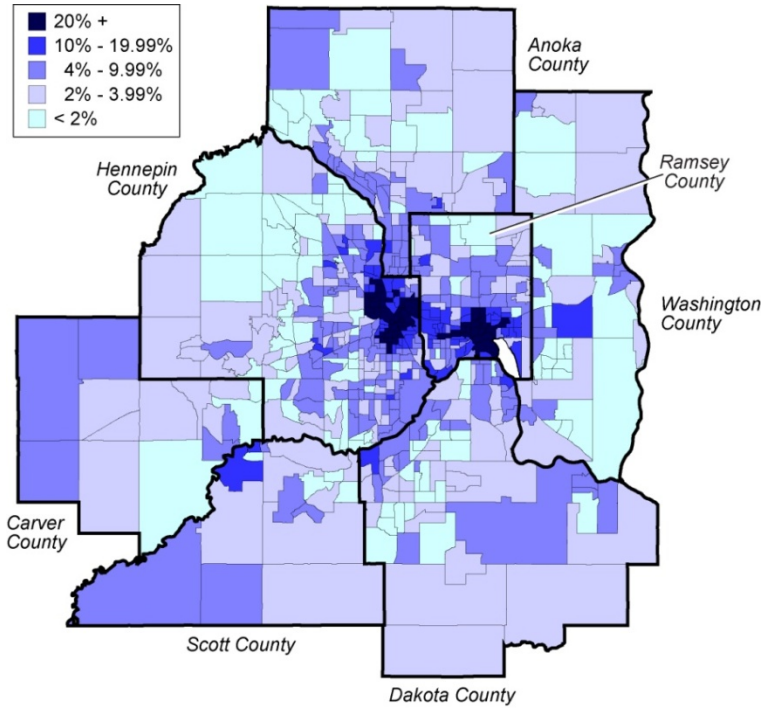
Higher concentration of poverty in neighborhoods can have deep-reaching impacts including limited education opportunity due to poor student performance and lower-quality schools, increased crime rates, poorer health outcomes, less investment by private sectors industries and greater local government costs due to higher participation in public programs (Kneebone, Nadeau, & Berube, 2011).

When we map the percentage of households with incomes below the federal poverty level (FPL) by census tract, we see that:

- Neighborhoods with high concentrations of low-income residents continue to be concentrated closer to the cities of Minneapolis and St. Paul.

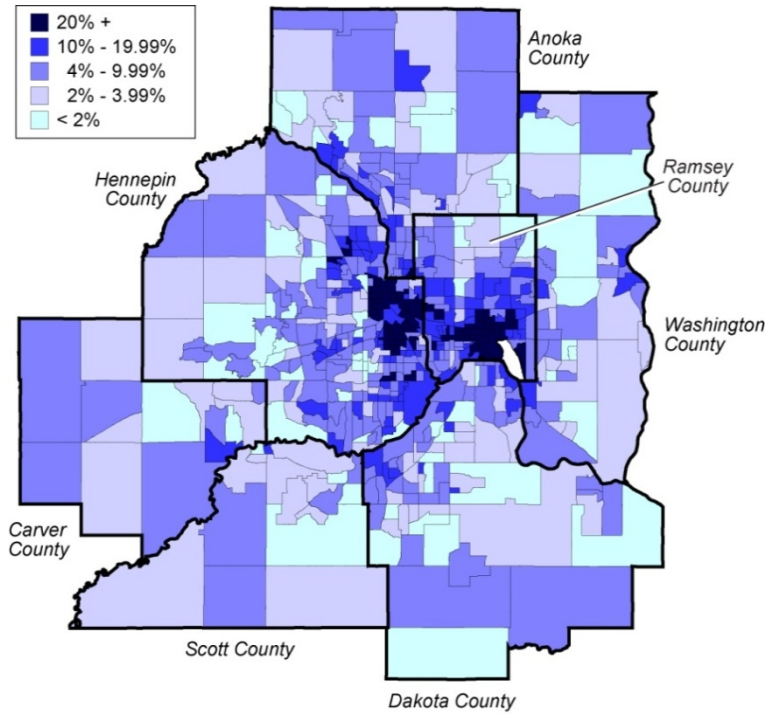
- The rates of poverty increased in a number of suburban cities (Figures 11, 12).

11. Percent of residents living in poverty, 2000



Source: *Wilder Research analysis of U.S. Census data (2000).*

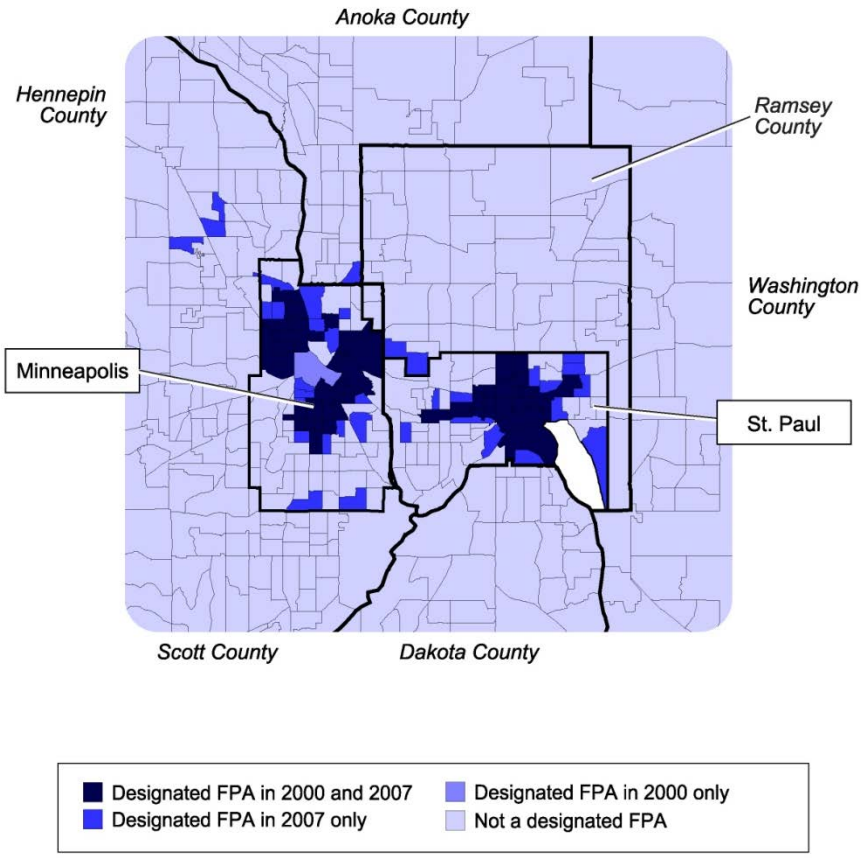
12. Percent of residents living in poverty, 2007



Source: *Wilder Research analysis of American Community Survey data (2005-2009).*

Federal poverty areas are designated census tracts where 20 percent of households or more have incomes that fall below the federal poverty level. They are still concentrated in areas of Minneapolis and Saint Paul, but have expanded since 2000 and there are new areas across the 7-county metro region (Figure 13). Poverty has also increased within some of these neighborhoods. In 2007, there were seven neighborhoods with more than half of its residents living in poverty. None of the census tract neighborhoods had such high concentrations of poverty in 2000.

13. Change in federal poverty areas (FPA) designation, 2000, 2007



Source: Wilder Research analysis of U.S. Census Bureau (2000), American Community Survey data (2005-2009)

Housing challenges

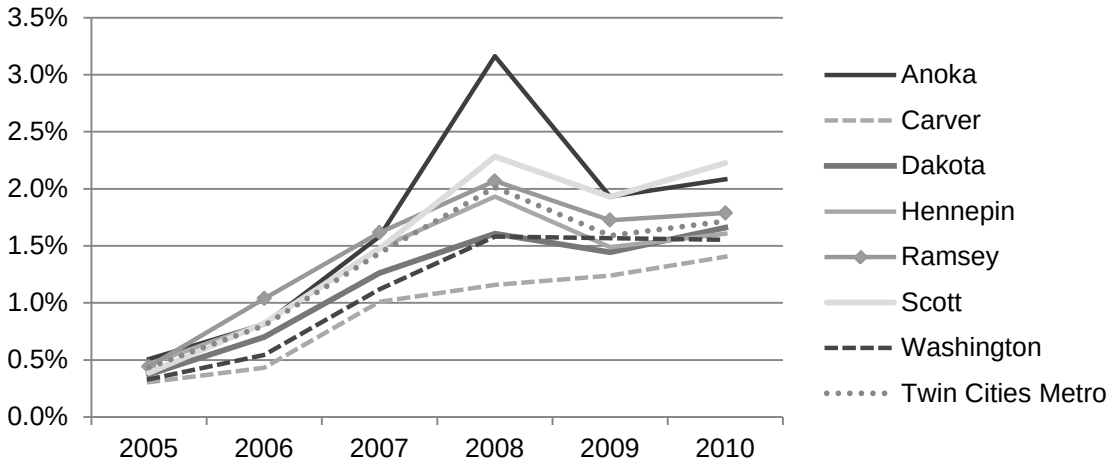
Additional data suggest a sizeable proportion of residents face high housing costs, which limits the amount of money families have at their disposal to pay for other needs including food, transportation and health care coverage. Cost-burdened households are those paying 30 percent or more of their income for monthly housing costs.

- Overall, during the past 10 years, the percentage of cost-burdened households in the Twin Cities region increased from 24 percent in 2000 to 36 percent in 2010.
- Since 2006, the total number of cost-burdened households has remained fairly constant (35-36%), impacting just over 375,000 households.

While the net number of cost-burdened households has not changed dramatically over the past five years, many families lost their homes due to foreclosure during this time and moved into less expensive housing. Therefore, the total number of households who have faced difficult choices in order to live within their family budget may have grown. Though not explored in this report, national data suggest that while lower-income households continue to face the greatest housing costs burden, this phenomenon is moving up the income scale (Joint Center for Housing Studies at Harvard University, 2011).

Foreclosure rates were highest in Anoka and Hennepin counties, but similar patterns are observed across the Twin Cities metro (Figure 14). While it was beyond the scope of this report to map differences in foreclosure rates across the region, a national study by the Joint Center for Housing Studies at Harvard University (2011) shows that nearly half of foreclosure auctions in 2010 were located in 10 percent of the nation's census tracts.

14. Rate of foreclosures, Twin Cities (2005-2010)



Source: Adapted from Foreclosures in Minnesota: A report based on county sheriff sales (Minnesota Home Ownership Center, February 2010) using County reported sheriff's sales, 2005-2010 parcel counts from MN Department of Revenue

Recent demographic changes

The Twin Cities region is becoming home to an increasingly older and more culturally diverse population of residents, which presents both opportunities and challenges for reducing health inequities. For example, many new immigrant and refugee families come to the United States with healthy diet and lifestyle behaviors. As our region becomes increasingly diverse, there may be opportunities to learn from new immigrant populations and consider ways to help new immigrants maintain healthy lifestyle choices. In contrast, as the region's populations becomes older, associated health care costs will likely rise, leaving fewer dollars available to allocate toward preventive, upstream interventions that improve neighborhood conditions and other factors that influence health.

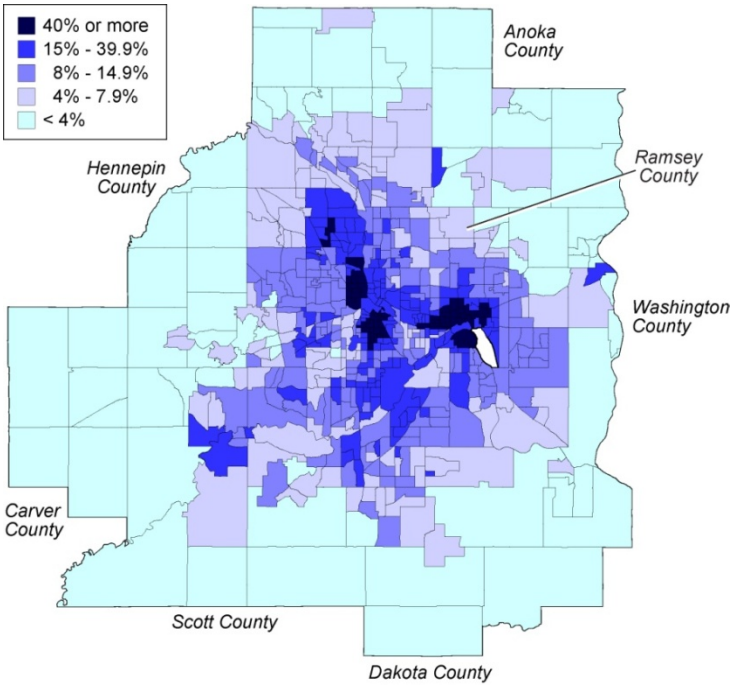
Increased cultural diversity

The Twin Cities region has become increasingly culturally diverse, and these trends are expected to continue over time. U.S. Census data demonstrates that:

- Between 2000 and 2010, the number of residents of color in the Twin Cities region increased 42 percent.
- As recently as 1990, less than 10 percent of our region was made up of persons of color, including African Americans, American Indians, Asian Americans and Latinos.
- By 2000, people of color made up 17 percent of our population.
- Today nearly one-quarter of residents of our region (24%) are people of color.
- By 2035, it is projected over one-third of residents (35%) will be people of color (McMurray, 2009).

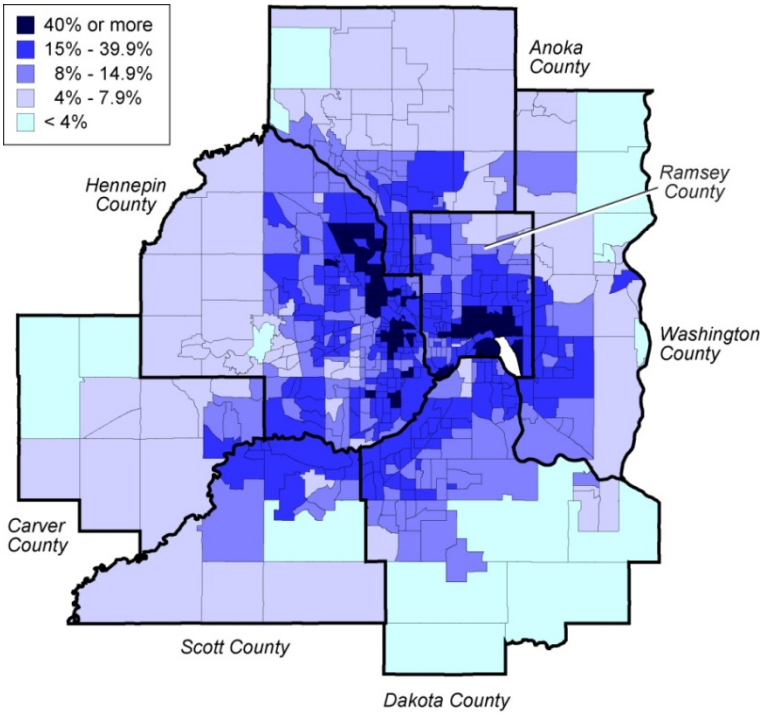
As shown in Figures 15 and 16, people of color tend to live in certain parts of Minneapolis and St. Paul and make up significant proportions of many suburbs, especially the "inner ring" suburbs that border the two central cities. However, as the region has become more culturally diverse, there are more people of color living in "outer ring" suburbs, particularly in Anoka, Scott and Washington counties.

15. Population of color by census tract, 2000



Source: *Wilder Research analysis of U.S. Census data*

16. Population of color by census tract, 2007



Source: *Wilder Research analysis of American Community Survey data (2005-2009)*

While the largest number of residents of color tend to live in Hennepin and Ramsey counties, there has been tremendous growth among populations of color in counties where suburban cities are located (Figure 17).

- In Anoka and Scott counties, the number of residents of color has more than doubled since 2000. Some of these changes are a result of high levels of immigration during the past decade.
- Since 2000, the number of African-born residents living in the Twin Cities region has increased from roughly 30,000 to nearly 54,000 in 2007.
- Large increases in the number of immigrants from Latin American countries also occurred during this time frame (from nearly 46,500 residents in 2000 to nearly 70,000 in 2007).
- Cultural diversity in our region is expected to continue to increase in the future, particularly among our region's youngest residents.

17. Percentage of residents of color, by county

	Number of residents of color, 2010	Percent of population of color, 2010	Percent change (2000-2010)
Twin Cities region	676,349	23.7%	42%
Anoka	48,915	14.8%	111%
Carver	8,509	9.3%	69%
Dakota	70,590	17.7%	79%
Hennepin	325,755	28.3%	35%
Ramsey	168,446	33.1%	35%
Scott	20,112	15.5%	107%
Washington	34,025	14.3%	91%

Source: U.S. Census Bureau, Decennial Census, 2010.

The Twin Cities region is also home to many new immigrant and refugee families; one in ten metro residents was born outside of the United States. According to 2010 Census data, Minnesota is home to the largest number of Somali refugees in the United States, with many living in the Twin Cities metro area. The Twin Cities is also home to large populations of Latino and Southeast Asian immigrants and refugees.

The graying of our region

A large shift in the age of residents in our region is also expected over the next two decades.

- The number of adults in the Twin Cities metro who are 65 years of age or older has risen slightly over time, from 10 percent of residents in 2000 to 11 percent in 2010.
- During the next two decades, the number of Twin Cities residents over age 65 is expected to nearly double.

The need for new solutions

Despite some gains made through ongoing efforts to address racial inequities in housing, education and health, Minnesota, as a state, has not yet found ways to fully eliminate disparities. According to a 2009 report by the Joint Center for Political and Economic Studies, eliminating health disparities in the United States could result in $56 billion per year of savings in direct medical costs and an additional $252 million in indirect medical costs caused by missing work due to illness and premature death (LaVeist, Gaskin, & Richard, 2009). As our region becomes more culturally diverse and faces the economic challenges of our time, it's important that existing efforts continue and new solutions be uncovered to create and maintain a productive workforce and improve overall health outcomes in the area.

There is not a simple solution to eliminating health inequities in our region, but, as we pointed out in our initial report, there are multiple statewide and local efforts in place to address inequalities and more that can be done. Intentional and coordinated efforts, done in partnership with community residents, are needed to understand the root causes of health inequities in local communities and identify effective, creative solutions to modify the underlying societal and economic factors that influence health.

Report supplement: Relationships between income and neighborhood conditions

> It is unreasonable to assume that people will change their behavior easily when so many forces in the social, cultural and political environment conspire against such change.
> —Institute of Medicine, 2001

In this section of the report, we look more closely at three "upstream" factors that contribute to health inequities: access to healthy foods, opportunities for physical activity and social connectedness. After briefly describing how each area influences health outcomes, we use local data sources to explore differences between population groups and offer some strategies that can be used to improve health outcomes. Due to the sampling methods used to administer the local resident surveys, we cannot make comparisons between racial and ethnic groups. Instead, we focus primarily on identifying differences between population groups based on income and geography.

The neighborhood conditions highlighted in this section offer some potential approaches to look upstream to improve health outcomes in the Twin Cities region. These strategies cannot be considered a substitute for efforts to change economic opportunities, work conditions, quality of housing and access to education and health care (Farquhar, Michael, & Wiggins, 2005). Rather, strategies are needed to address both social and economic inequalities.

About the measures

To explore how key social determinants may influence health outcomes in the Twin Cities region, we relied heavily on information from three survey data sources: the Hennepin County SHAPE survey, the Metro Adult Health Survey (MAHS) and the Minnesota Student Survey (MSS). All analyses for these sources were conducted by staff from local public health departments (SHAPE, MAHS) or the Minnesota Department of Health (MSS). Detailed information describing the administration of these surveys is not reported here, but can be found in other published documents.[1]

[1] Readers may refer to the following sources for more information describing the survey administration protocols and response rates for each of the following surveys: Hennepin County SHAPE survey (www.hennepin.us/SHAPE); Metro Adult Health Survey (http://sites.google.com/site/publichealthdata/Home/metro-adult-health-survey) ; and Minnesota Student Survey (http://www.health.state.mn.us/divs/chs/mss)

Access to healthy foods

Healthy eating is one step that can reduce risk for cardiovascular disease, obesity and subsequent chronic disease. In particular, increasing consumption of fruits and vegetables and reducing consumption of high-calorie, high-fat, processed foods can make a difference, yet:

- Less than one-quarter of Minnesota residents (22%) eat five servings of fruits and vegetables each day (Centers for Disease Control and Prevention, 2010). Although this percentage has stayed fairly consistent over the last decade, it is a significant reduction from 1996, when 3 in every 10 residents met the same healthy eating guideline.

Eating habits can be influenced by the availability and affordability of healthful food in neighborhoods. The presence of grocery stores, farmers' markets and community gardens increases the availability of fresh fruits and vegetables. Community gardening efforts or partnerships where residents can purchase foods directly from local farms can also make a difference. Access to healthy foods can also improve through increased participation in food support programs. Changes in policies that lead to reductions in the cost of fresh fruits and vegetables can also encourage healthier eating habits.

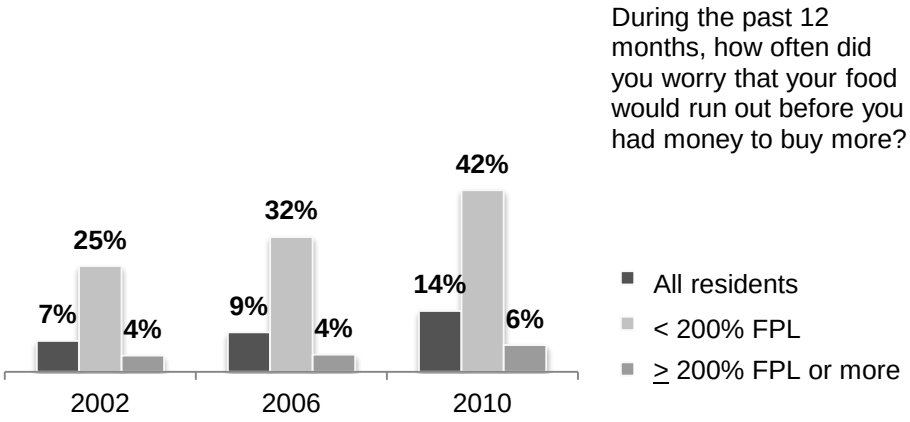
Growing food insecurity

Food security describes the extent to which households have access to "nutritionally adequate" foods (Anderson, 1990). Food insecurity occurs along a continuum; households are considered moderately food insecure if there are occasional concerns about the availability of food but severely food insecure if they skip meals or otherwise ate less than what they felt they should.

In this report, we include three different measures of food insecurity: self-reported concerns about having adequate money for food, food shelf use and participation in the federal Supplemental Nutrition Assistance Program (SNAP, formerly the Food Stamp program).

In 2010, 42 percent of Hennepin County lower-income residents worried they would not have enough money to buy food during the last year. Overall, the percentage of residents in Hennepin County concerned about having enough money for food has doubled since 2002 (Figure 18).

18. Percentage of residents who "often" or "sometimes" worry about having enough money for food, Hennepin County (2002-2010)



Source: Hennepin County SHAPE Survey, 2002, 2006, 2010 (analysis by Hennepin County Human Services and Public Health Department).

The increased use of food support programs and food shelves also demonstrates growing food insecurity in the region. SNAP, formerly referred to as the federal Food Stamp Program, is a nutritional program that provides eligible residents with benefits to purchase healthier foods. The program is open to residents who meet specific income guidelines, but the rate of participation in the program among those eligible residents varies by county (from 37% in Carver County to 78% in Ramsey County) (Figure 19).

- Since 2008, the number of food shelf visits in the Twin Cities region increased over 30 percent, to a total of over 1.5 million[2].
- Since 2000, the number of Twin Cities residents enrolled in the Supplemental Nutrition Assistance Program (SNAP) increased by approximately 50,000.
- Between 2000 and 2007, participation increased across all Twin Cities counties, with the number of participants more than doubling in some counties.

[2] Data provided by Hunger Solutions. The totals include all food shelves that are members of the local food banks, but may not include smaller, independent food shelves (such as one-time food distributions done following a worship service).

19. SNAP participation

	Number of SNAP participants (% of county population)	
	2000	2007
Anoka	7,071 (2.4%)	13,743 (4.2%)
Carver	607 (0.9%)	1,266 (1.4%)
Dakota	5,296 (1.5%)	11,910 (3.1%)
Hennepin	59,774 (5.4%)	77,700 (6.9%)
Ramsey	36,311 (7.1%)	51,045 (10.2%)
Scott	995 (1.1%)	2,408 (1.9%)
Washington	2,765 (1.4%)	5,004 (2.2%)

Source: Supplemental Nutrition Assistance Program (SNAP) data system, U.S. Department of Agriculture Economic Research Service

Promising strategies to encourage healthy eating

There are a number of promising strategies that can be implemented to ensure healthy foods, particularly fresh fruits and vegetables, are available and affordable in all communities.

For example, as part of their "Market Bucks" program, Blue Cross and Blue Shield of Minnesota encouraged SNAP recipients to purchase more fresh fruits and vegetables at local farmers' markets by matching the first $5 spent with electronic benefit transfer (EBT) cards with a $5 market coupon. A variety of other approaches can also be used to increase the availability of fresh fruits and vegetables in neighborhoods (Lee, Mikkelsen, Srikantharajah, & Cohen, 2011):

- Increase participation in food support and nutrition programs to increase the accessibility and availability of healthy foods.
- Establish grant and loan programs, technical assistance and other incentives to attract retail grocery stores to underserved neighborhoods and to encourage store owners to increase the availability of fresh fruits and vegetables and other healthy foods in their stores.
- Consider healthy food access (e.g., grocery stores, farmers' markets, corner stores, restaurants, community gardens) in general plans and land use decisions and adopt zoning policies that support healthy food retail in underserved communities.
- Leverage the purchasing power of federal Women, Infants and Children Program (WIC) and SNAP program participants to encourage small stores and farmers' markets to offer fruits and vegetables in low-income neighborhoods.

Opportunities for physical activity

Physical activity is associated with a variety of positive health outcomes, including improved cardiovascular health, lower risks of diabetes and reduced risk of obesity when combined with reduced calorie consumption. Yet, despite the benefits associated with physical activity, about 40 percent of Twin Cities residents do not get the recommended 30 minutes or more of moderate physical activity 5 days a week (Figure 20). In all counties except Dakota County, residents with lower income levels were less likely to be physically active than residents with higher levels of income. Although physical activity is measured differently in Hennepin County, lower-income residents also were less likely to be physically active than higher income residents (not reported).

20. Percentage of residents who participate in 30 minutes or more of moderate physical activity 5 days a week (2010)

	Total	Residents with incomes 200% FPL or below	Residents with incomes >200% FPL
Anoka	40%	33%	43%
Carver	43%	30%	44%
Dakota	45%	51%	42%
Ramsey	45%	45%	47%
Scott	42%	31%	45%
Washington	44%	25%	44%

Source: Metro Adult Health Survey, 2010 (analysis by Public Health Departments of Anoka County, Carver County, Dakota, County, S.t Paul-Ramsey County, Scott County)

These disparities in physical activity could be attributed to a variety of factors related to income. Residents with lower levels of household income may have less disposable income available to pay for gym memberships or recreation leagues, face transportation barriers, work non-standard hours or have multiple jobs, or have fewer "built-in" opportunities for exercise in the neighborhood.

Considerable work has been done to explore ways in which the built environment, including buildings, sidewalks and transportation, can encourage or discourage physical activity among residents. Increased physical activity is often associated with the use of public transportation, a high-quality infrastructure of sidewalks and bike lanes, the presence of traffic calming and safety measures that slow traffic and allow safe crossings across busy streets and intersections (Rodriguez, 2006). Proximity to stores, restaurants and schools can also lead to increased walking and biking among neighborhood residents.

Recent studies have found a positive relationship between access to community facilities and increased levels of physical activity. For example, one study found poorer neighborhoods had fewer physical activity facilities than more affluent neighborhoods, and this factor is significantly associated with subsequent health disparities, such as individual levels of physical activity and obesity (Gordon-Larsen, et al., 2006).

Local data sources demonstrate a relationship between access to recreation centers, parks, trails and playgrounds and physical activity in our region. Although most residents in our region live near some type of green space or indoor recreation facility, those who did not live near these amenities are more likely to be physically inactive than those who live near indoor and outdoor areas for exercise.

- Nearly one-quarter of Hennepin County residents (22%) who did not live near recreation centers, parks, trails or playgrounds were physically inactive.
- Just 10 percent of those living near those amenities were physically inactive.

Similar results were found across the other six counties in the region where:

- Twenty-three percent of residents without access to these amenities were inactive.
- Just 7 percent of residents with these amenities nearby were inactive.

Although the lack of nearby parks, green space and recreational facilities is a barrier to physical activity among some Twin Cities residents, other factors were more likely to be identified as barriers to physical activity (Figure 21).

- Nearly half (47%) of residents with lower incomes identified the cost of memberships and other fees as a barrier to physical activity.
- Lower-income residents were also approximately three times more likely than higher-income residents to identify limited facility hours or distance as barriers to physical activity.

21. How much of a problem are the following factors for you in terms of preventing you from being more physically active? (6-county metro, not Hennepin County)

	Percentage of residents responding "a big problem"		
	Total	Residents with incomes 200% FPL or below	Residents with incomes >200% FPL
The cost of fitness programs, gym memberships, admission fees	26%	47%	20%
Lack of time	22%	18%	24%
Lack of self-discipline or willpower	18%	21%	19%
Public facilities not open or available at the times I want to use them	8%	16%	5%
No one to exercise with	7%	6%	7%
Distance I have to travel to fitness or community center	4%	9%	2%
Lack of support from family/friends	3%	5%	2%
Distance I have to travel to parks or walking trails	2%	4%	1%
No safe place to exercise	2%	4%	1%

Source: Metro Adult Health Survey, 2010 (analysis by Public Health Departments of Anoka County, Carver County, Dakota, County, S.t Paul-Ramsey County, Scott County)

Promising strategies to create greater opportunities for physical activity

Communities can use a number of strategies to create more opportunities for physical activity within neighborhoods. In 2006, Federal Collaboration on Health Disparities Research formed a Built Environment Workgroup to identify ways to eliminate health disparities through equitable development strategies (Hutch, et al., 2011). The strategies recommended by the workgroup included:

- Integrating mixed land use policies.
- Creating and promoting walkable neighborhoods.
- Working varied transportation options into development decisions.
- Encouraging community-school partnerships to promote student walking and biking.
- Rehabilitating areas with vacant/abandoned lots.

A recent literature review, exploring differences in the physical activity environment in lower-income neighborhoods and available to communities of color, recommended a number of strategies for policy makers who want to engage residents in supporting physical activity (Taylor, 2008):

- Expand and maintain safe parks, protect open spaces and implement safe routes to school.
- Prioritize lower-income communities and communities of color when maintaining and creating new neighborhood parks and pocket parks, open spaces and other destinations for recreational physical activity.
- Improve sidewalk availability and quality to enhance the walkability of urban and other neighborhoods.
- Collaborate with public health, law enforcement, planners and civic groups to develop strategies that can simultaneously improve neighborhood safety, reduce problems with social and physical disorder and encourage physical activity.
- Increase policing in high-crime areas, increase pedestrian walkways and parks and implement alternative policing strategies, such as neighborhood watch groups.
- Develop joint-use agreements that allow community members to use school-owned recreational facilities and allow schools to use community facilities, such as swimming pools.

The link between social connectedness and health

The relationships residents have with one another also influences health, both directly and indirectly. By social connectedness, we mean the extent to which an individual interacts with other individuals as measured by, for example, the number of close friends, the frequency of interaction with family and/or friends, amount of participation in volunteer activities and community events, or similar measures.

Some experts sort the types of relationships that form among individuals into bonding, bridging and linking social capital (Bhandari & Yasunobu, 2009).

Bonding — the intimate ties between family, close friends and others who share very similar personal characteristics constitute bonding social capital. These types of relationships result in inward-looking, tightly-formed groups that support and nurture their own members.

Bridging — this type of social capital reflects the more distant relationships between coworkers or community residents. It can result in like-minded people from different

social networks working together to address common community concerns or leverage a broader array of resources.

Linking — this term refers to networks formed among people with very different social backgrounds or levels of power, such as policy makers and their constituents.

The different types of social capital can promote health in a variety of ways. Some studies have shown that higher levels of trust between residents are associated with lower mortality rates (Lochner, et. al., 2003). In contrast, the absence of social connectedness — social isolation — is considered a risk factor for multiple chronic diseases, including obesity, high blood pressure, cancer and diabetes (Cacioppo & Hawkley, 2003).

Studies have shown that the greater the social isolation of individuals, the greater their symptoms of depression and the more likely they are to self-report that they are in fair or poor health. The effect of isolation on health occurs regardless of socioeconomic status, age, gender or race, but the negative impacts of social isolation appear most among disenfranchised communities, including the poor and the elderly.

While more research is needed to understand the exact mechanisms through which social connectedness influences health, research has shown that higher levels of perceived social connectedness are associated with lower blood pressure rates, better immune responses and lower levels of stress hormones, all key factors that contribute to the prevention of chronic disease (Uchino et al., 1996). These physiological changes in the body can alter how the body responds to stress and how quickly it repairs itself following injury.

In addition to physiological changes, stress can lead to poorer health outcomes in a variety of ways:

- Increasing tobacco use and other risky behaviors, such as alcohol use;
- Reducing healthy behaviors such as eating well, exercising and sleeping adequately;

and

- Obscuring symptoms and increasing the delay in seeking care (Institute of Medicine, 2001).

Social connectedness can also promote health indirectly. Bonding and bridging relationships between individuals can create healthy social norms, access to local services, emotional support to individuals and greater health knowledge within the community (Kim, et al., 2006).

Communities with high levels of bridging and linking social capital are also better positioned to influence policies that support health, particularly when there is socioeconomic and demographic diversity within social networks.

There can also be negative consequences when social networks exclude residents or encourage negative behaviors. High social connectedness among some residents in a geographic area can exacerbate social divisions based on race, class and other social features. In addition, social connectedness can reinforce negative norms and unhealthy behaviors in the same ways it reinforces positive one. Gangs are examples of groups with high levels of bonding social capital which exert strong negative influence. Tightly knit families may also have high levels of bonding social capital, but experience more stress because they feel greater responsibility for the well-being of other family members (Mitchell & LaGory, 2002).

Social connectedness among Twin Cities residents

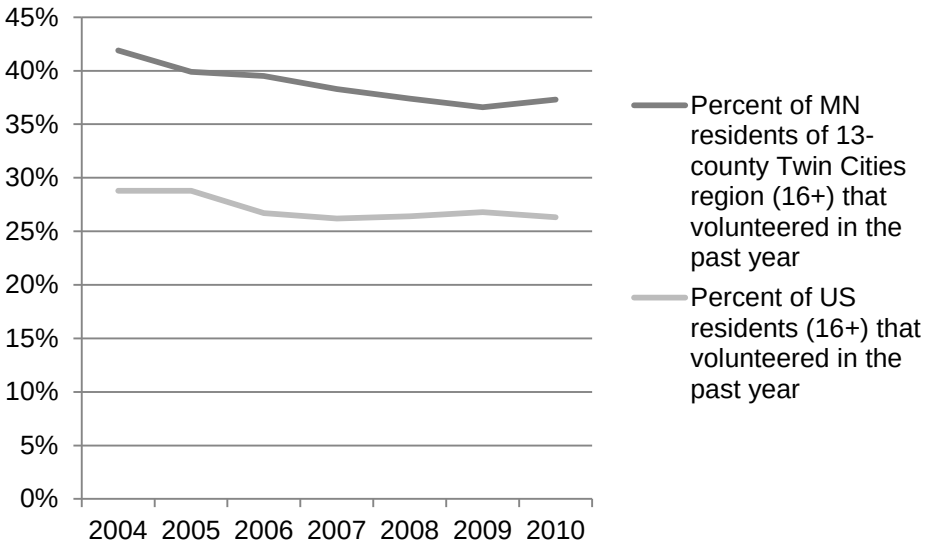
The emerging research on social connectedness and related concepts contains a variety of measures, from volunteerism to the number of friends/acquaintances in an individual's social network to people's own perceptions of connectedness or isolation. While limited, the available indicators show that many Minnesotans of all ages feel connected to their communities. However, there are disparities based on socioeconomic position.

Volunteers are important community assets whose time and effort builds social capital in communities, enriches the lives of those they serve and often provides care and services that neither government nor the private sector can afford to offer. High rates of volunteerism also signal a healthy willingness of individuals to pitch in and make the community a better place.

Although volunteerism among Twin Cities region residents has gradually declined since 2004, it continues to be higher than the national average.

- In 2010, 37 percent of Twin Cities residents (age 16 or older) volunteered some of their time during the past year.
- Approximately one-quarter (26%) of residents did so nationally (Figure 22).

22. Percentage of residents (age 16+) who volunteered in the past year (2002-2010; 13-county metro region)



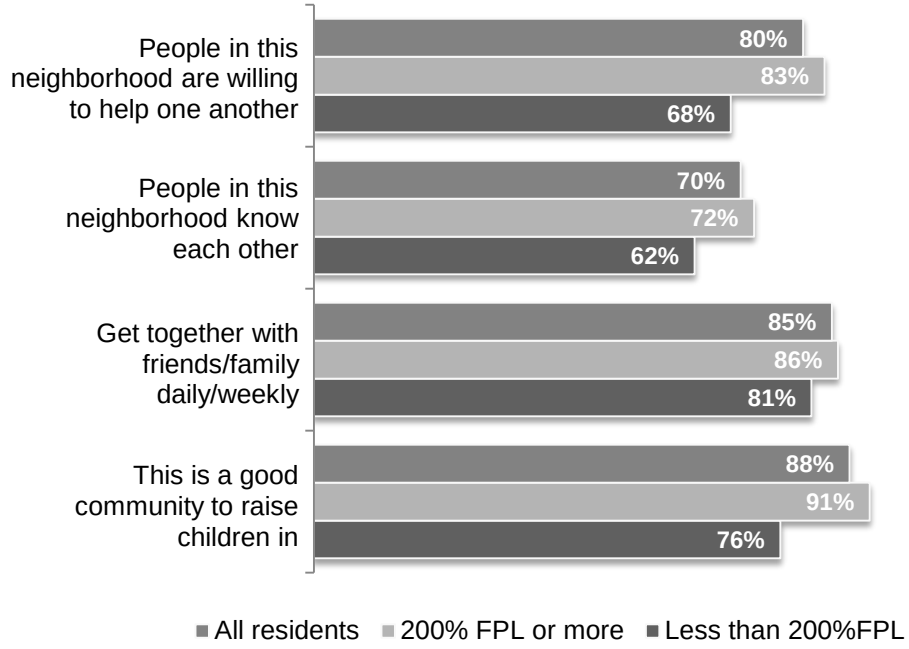
Source: Current Population Survey, Volunteer Supplement, conducted by the U.S. Census Bureau

Overall, many Hennepin County residents had regular contact with friends and family and felt they lived in a supportive neighborhood:

- Most Hennepin County residents (85%) reported they get together with friends or family weekly or more.
- Fewer residents felt that people in the neighborhood knew each other and were willing to help one another (Figure 23).
- Lower-income residents were significantly less likely to feel the same sense of connection to their neighborhood compared to other residents, as were residents with less stable housing (data not reported).

23. Perceived social connectedness among Hennepin County residents

Percent of residents who "strongly" or "somewhat agree"

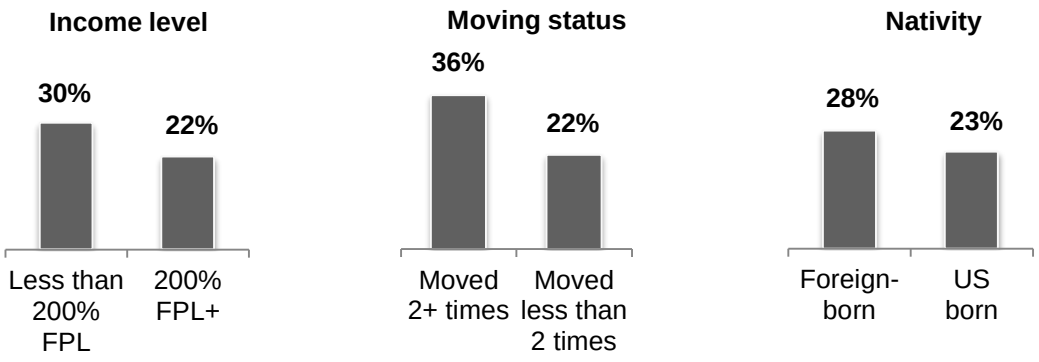


Source: Hennepin County SHAPE survey, 2010 (analysis by Hennepin County Human Services and Public Health Department).

Note: Residents with lower housing stability are described as those who have moved two or more times in the past 2 years. Across all items, residents living in poverty (less than 200% Federal Poverty Level), were significantly less likely to "strongly" or "somewhat" agree ($p < 0.05$).

Approximately three-quarters of Hennepin County residents are involved in their community in some way, either through school, community or faith-based activities. However, residents who live in poverty have less housing stability or who immigrated to the United States are more likely to not be involved in these types of activities (Figure 24). While these residents may have strong social networks with friends and family, they likely have less bridging social capital and may be more likely to feel socially isolated.

24. Percentage of Hennepin County residents never involved in community activities



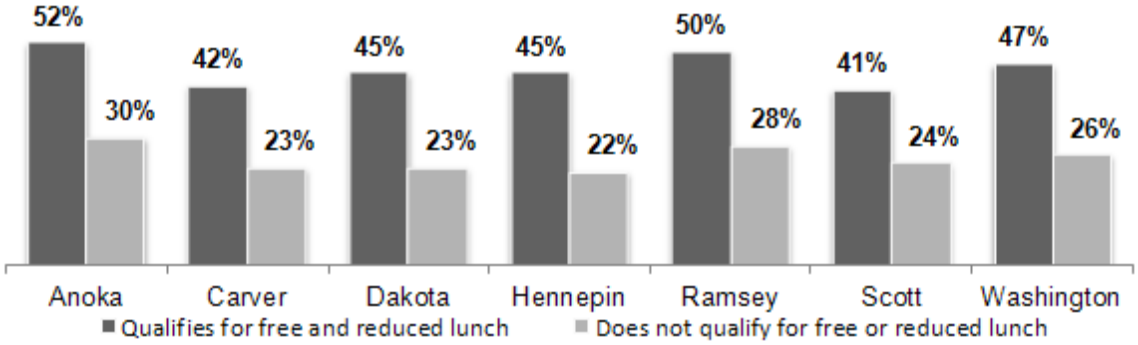
Source: Hennepin County SHAPE survey, 2010 (analysis by Hennepin County Human Services and Public Health Department).

Similar patterns of participation in school and community are seen among youth. Among 9th grade students:

- Students from lower-income families (identified as students receiving free/reduced price lunch) and students of color were less often involved in after-school academic, extracurricular, community or faith-based activities (Figure 25).

This pattern was consistent in each county in the region. While these students may have strong social networks with peers and family members, it suggests that some students may not have high levels of social support in their community.

25. Percentage of 9th grade students in the Twin Cities region who participate in any type of extracurricular, community, or faith-based activity less than 3 times per week

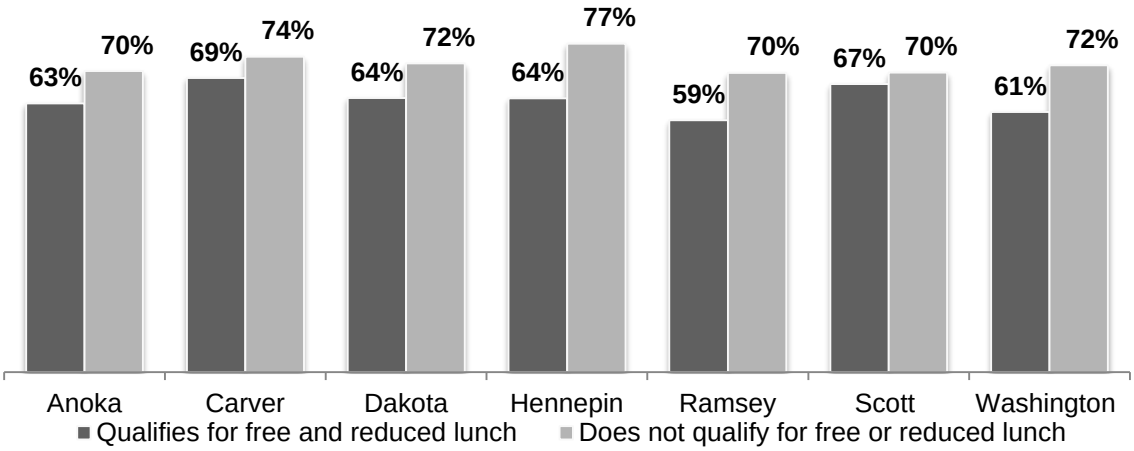


Source: Minnesota Student Survey, 2010 (analysis by Minnesota Department of Health)

Social connectedness is often measured through analyses of social networks — the number of connections people have with others and the strength of these relationships. Although it is beyond the scope of this project to gather these types of data among adult residents, as part of the Minnesota Student Survey, students are regularly asked whether they feel they have a caring adult in their life. According to this survey:

- In the Twin Cities region, 70 percent of 9th grade students felt they had at least one non-family caring adult in their life.
- Data from each county showed students from low-income families or communities of color were less likely to have a caring adult in their life (Figure 26).

26. Percentage of 9th grade students who report they have at least one non-family caring adult in his/her life



Source: Minnesota Student Survey, 2010 (analysis by Minnesota Department of Health)

Promising strategies to promote social connectedness

In 2009, the Minnesota Department of Health received funding from the Blue Cross and Blue Shield of Minnesota Foundation. An advisory group was formed to conduct a series of key informant interviews to explore the concept of social connectedness, as relevant to the *Healthy People 2020* national public health framework and health improvement goals (Minnesota Department of Health, 2010). Because of that effort, a number of strategies were identified to strengthen social connectedness, including:

- Use community planning and design elements that encourage active living, creating opportunities for greater interactions between residents.
- Establish recreation programs for youth, as well as gathering opportunities for residents of all ages and cultures.
- Support community efforts to address and encourage economic opportunity, supportive work environments and integration and appreciation of the community's diverse cultures.

Other strategies for increasing social connectedness include:

- Invest in existing community "hubs" that serve as linkages to information and resources (e.g., an African American church).
- Connect civic and political institutions to give residents greater influence on decisions.

- Redesign public physical spaces and virtual communities to encourage social connections.
- Involve residents in health policy decisions through health impact assessments or other community-driven processes.
- Use planning approaches that focus on enhancing community strengths.

While building social capital in communities is often a grassroots, resident-led initiative, government agencies and community leaders can play important roles in increasing social capital in communities. A paper prepared by Canada's Policy Research Initiative asserted that government plays a role in increasing social connectedness by creating policies that affect how social relations are formed (bridging social capital) and by convening groups to work on programs and initiatives (linking social capital).

This paper suggests government agencies and policy makers could play more deliberate roles in enhancing social connectedness by:

- Developing policies that help populations at risk of social isolation;
- Supporting residents through major life-course transitions; and
- Promoting community development efforts (Policy Research Initiative, 2003).

In closing

Whether we explored access to healthy foods, opportunities for exercise or social connectedness, the data presented in this report supplement demonstrate that residents with lower incomes tend to live in neighborhoods with less access to resources and greater barriers to healthy living.

The strategies highlighted in this report offer approaches that can improve neighborhood conditions and make it easier for residents to make healthy choices. These approaches can also help reduce health inequities, but only when the underlying economic and social conditions that contribute to varied neighborhood conditions are taken into consideration and interventions are implemented to improve the health of all residents.

Appendix

Detailed methods

Calculating life expectancy and mortality rates

The death data used to estimate life expectancy and mortality were provided by the Minnesota Department of Health. Multiple years of data were pooled, providing us with enough data on deaths in the region so that we could make reliable inferences for life expectancy and mortality rates for 2000 (using data collected 1998-2002) and 2007 (using data collected 2005-2009). Even so, in small geographies such as census tracts, some level of instability in estimating life expectancies is still to be expected due to natural variation in the number of deaths and the age at which those deaths occur within these areas. Therefore, one should be cautious in examining and comparing the life expectancies of individual census tracts.

Census-tract level population estimates were taken from the 2000 census and 2005-2009 American Community Survey (referred to as "2007" data in the report). The 2000 census provides contextual data available at the census tract level, such as median household income, percentage of the population in poverty and percentage of the adult population who have attained a bachelor's degree or more education. The 2010 census, which greatly reduced the number of questions asked of respondents compared to past years, did not include these socioeconomic questions, so we used the most recent data available through the American Community Survey (2005-2009).

Life expectancy at birth shows the average number of years a baby born in a given year can expect to live if that baby were subject to the same mortality conditions across the life course that prevailed at the time of birth. Though these mortality conditions are highly unlikely to prevail throughout a baby's life, life expectancy is a useful measure for comparing health outcomes over time or between populations.

The mortality rates given in this report are age-standardized rates. Standardizing on age is an important part of analyzing mortality data, since the age distribution of a population has such a strong effect on the rate of deaths in that population.

To produce the age-standardized mortality rate, the population is divided into age groups (0-1, 1-4, 5-9, 10-14, 15-19, etc.). The number of deaths in each age group is then divided by the population in that age group. These probabilities of death at each age are then weighted to match the age distribution of the standard population, in this case the population in the 7-county region in the year 2000. The weighted age-specific rates are then summed

over all age groups and multiplied by 100,000 to produce a number that estimates the number of deaths per 100,000 residents. This number, the age-standardized mortality rate, is then comparable across geographic areas with different age distributions.

In some cases, it is useful to compare mortality data for adults only. In these cases we calculated age-standardized mortality rates for the population age 25 to 64. We used the same method described above, but included only the population age 25 to 64. The 2007 population in the 7-county region, age 25 to 64, was used as the standard population in these cases. We did this to moderate the effect of nursing homes in certain census tracks, and to be able to make better comparisons between native-born and foreign-born populations.

Geographic coverage

In our 2010 report, we used zip codes as our level of analysis. However, due to changes in zip code boundaries, these areas could not be used when reporting changes in geographic areas over time. Instead, we focused on census tracts that fell completely within the boundaries of the Twin Cities 7-county region for the analysis of 1998-2002 data and 2005-2009 data. The 7-county region includes Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington counties.

Census tracts that crossed the boundary of the 7-county region were excluded from the analysis. In addition, census tracts with very small populations (less than 5,000 residents) were combined with other adjacent tracts that had similar aggregate socioeconomic characteristics. When an adjacent census tract with a similar composition was not available, the census tract with the small population was excluded from the analysis.

Data sources

Population estimates of the 7-county region were taken from the *Integrated Public Use Microdata Series, 2006-2008 American Community Survey.* Steven Ruggles, Matthew Sobek, Trent Alexander, Catherine A. Fitch, Ronald Goeken, Patricia Kelly Hall, Miriam King and Chad Ronnander. *Integrated Public Use Microdata Series: Version 4.0* [Machine-readable database]. Minneapolis, MN: Minnesota Population Center [producer and distributor], 2006-2008. http://usa.ipums.org/usa/

Public Health Departments of Anoka County, Carver County, Dakota County, St. Paul-Ramsey County, Scott County, Washington County, State of Minnesota; *Metro Adult Health Survey Collaborative (2010). Metro Adult Health Survey Data.* January 2011.

Limitations

This report examines existing data sources to identify inequities in the Twin Cities region. While this methodology is appropriate and has been used by other researchers to identify relationships between socioeconomic status, race and health outcomes, there are also limitations to this approach. First, while it is common for aggregate population-level indicators to be used to describe the socioeconomic characteristics of residents within geographic areas, individual-level factors that may also influence health outcomes are not taken into account in these types of studies. Data limitations restrict our ability to conduct more rigorous multi-level analyses that take both community- and individual-level factors into account. While there are data sources that can be used to report some of these individual factors at a county or school district level, there are fewer data sources available to report health outcomes at a more specific neighborhood level. Our study is grounded in research conducted in other metropolitan areas which have found that there are neighborhood impacts on health that persist after controlling for individual factors (Ludwig et al., 2011). However, we cannot determine the extent to which changes in life expectancy are due to changes in neighborhood conditions or changes in the population of residents who live within these areas.

There are also challenges associated with defining neighborhoods in ways that are most meaningful to residents themselves. This report explores differences in neighborhoods using census tract boundaries, which results in small geographic areas where residents with similar socioeconomic characteristics live. However, particularly those in cities where local travel is affordable and easy, residents often work, shop, attend school, or participate in other activities outside of their neighborhood of residence. Multi-method approaches, including reviews of census tract boundaries, land use maps, neighborhood observations and interviews with residents, have been suggested to ensure that neighborhoods boundaries defined for study purposed align with how residents describe their community (Weiss, et al., 2007). However, these approaches were not feasible to incorporate into the scope of this study.

As in other studies, this report considers the relationship between health outcomes and long-term health outcomes at a single point in time. Although there can be immediate impacts from some environmental factors (e.g., increased rates of asthma-related hospitalizations when air quality worsens), health outcomes are typically influenced by a series of events or exposures that occur over the life course and in changing environments. Therefore, while this report includes both changes in health outcomes and demographic trends in the Twin Cities region during the past decade, we are not implying that there is an immediate causal relationship between the two. Instead, the demographic changes we observe today are likely to influence future health outcomes and health care needs.

Finally, this report paints a picture of health inequities in the Twin Cities region and offers strategies to work toward the elimination of health inequities. Different evaluation approaches are needed to determine which types of interventions are most effective at improving health outcomes. Ecological studies, such as this report, must be combined with smaller, in-depth evaluations of policy changes or comparisons between neighborhoods to conclude which types of interventions are most effective in reducing health inequities (Diez Roux, 2001).

Leading causes of death in the Twin Cities 7-County region, 2005-2009

A1. Leading causes of death in the Twin Cities 7-County region, by racial/ethnic group and nativity 2005-2009

	ALL	American Indian	Southeast Asian (Foreign-born)	Asian (other)	African American (US-born)	African American (Foreign-born)	Hispanic	White (non-Hispanic)
Total number of deaths	84,015	586	1111	664	3,696	471	1020	76,467
Cancer	26.4%	18.1%	26.2%	23.0%	22.9%	31.4%	21.2%	25.7%
Heart Disease	25.5%	12.6%	11.4%	12.3%	14.7%	9.6%	10.1%	17.2%
Stroke (Cerebrovascular)	16.8%	4.1%	10.7%	6.9%	4.5%	6.4%	6.0%	5.5%
Unintentional Injury	5.6%	11.8%	4.3%	7.5%	7.6%	8.9%	12.7%	5.2%
COPD	5.4%	3.1%	3.2%	1.4%	3.0%	1.1%	2.4%	5.1%
Alzheimer's	4.9%	1.0%	1.3%	1.5%	1.3%	0.2%	0.6%	3.4%
Diabetes	3.2%	5.8%	4.7%	2.3%	4.7%	4.0%	4.5%	2.8%
Nephritis	2.9%	1.9%	4.5%	1.7%	2.6%	2.1%	2.4%	2.1%
Suicide	2.1%	3.4%	1.8%	3.2%	1.7%	1.9%	2.5%	1.6%
Pneumonia / Influenza	1.6%	1.5%	0.6%	1.5%	0.8%	0.4%	1.5%	1.5%
Cirrhosis	1.5%	7.2%	1.2%	0.3%	1.3%	0.6%	2.2%	1.0%
Septicemia	1.1%	1.9%	1.8%	2.0%	1.1%	1.7%	0.9%	0.8%
Perinatal Conditions	0.9%	0.7%	0.0%	7.4%	4.7%	0.0%	4.7%	0.3%
Congenital Anomalies	0.6%	0.7%	0.4%	3.8%	2.1%	0.6%	4.5%	0.4%
Homicide	0.6%	2.0%	0.9%	2.3%	5.1%	4.5%	2.8%	0.2%
AIDS/HIV	0.5%	1.0%	0.3%	0.2%	1.4%	4.2%	1.3%	0.1%
Atherosclerosis	0.2%	0.5%	0.0%	0.0%	0.1%	0.0%	0.0%	0.2%
SIDS	0.1%	1.0%	0.0%	0.3%	0.7%	0.0%	0.8%	0.1%
Other (residual)	0.1%	21.7%	26.8%	22.6%	19.9%	22.3%	19.0%	26.9%

Note: Percentages are not age-standardized.

A2. Leading causes of death in the Twin Cities 7-County region, by median household income group of ZIP codes, 2005-09

	ALL	Very low (<$35,000)	Low ($35,000-$44,999)	Medium ($45,000-$59,999)	High ($60,000-$74,999)	Very high ($75,000+)
Total number of deaths	83,769	13,910	16,935	29,184	12,370	11,370
Cancer	25.4%	21.2%	23.2%	25.4%	29.4%	29.8%
Heart Disease	16.8%	16.4%	17.3%	17.2%	16.7%	15.4%
Stroke(Cerebrovascular)	5.6%	5.5%	5.9%	5.7%	5.1%	5.4%
Unintentional Injury	5.4%	6.0%	5.3%	5.0%	5.8%	5.8%
COPD	4.9%	5.3%	5.3%	5.0%	4.3%	3.8%
Alzheimer's	3.2%	3.0%	3.0%	3.3%	3.3%	3.2%
Diabetes	2.9%	3.2%	2.9%	3.0%	2.8%	2.5%
Nephritis	2.1%	2.5%	2.0%	2.2%	1.9%	1.9%
Suicide	1.6%	1.5%	1.4%	1.5%	2.0%	2.0%
Pneumonia,Influenza	1.5%	1.7%	1.6%	1.5%	1.3%	1.4%
Cirrhosis	1.1%	1.3%	1.1%	1.0%	1.0%	0.8%
Septicemia	0.9%	1.1%	1.0%	0.8%	0.7%	0.9%
Perinatal Cond.	0.6%	0.8%	0.5%	0.5%	0.7%	0.8%
Congenital Anomalies	0.6%	0.7%	0.5%	0.5%	0.7%	0.7%
Homicide	0.5%	1.3%	0.5%	0.4%	0.2%	0.1%
AIDS/HIV	0.2%	0.6%	0.2%	0.2%	0.1%	0.1%
Atherosclerosis	0.1%	0.2%	0.2%	0.1%	0.1%	0.1%
SIDS	0.1%	0.2%	0.1%	0.1%	0.1%	0.1%
Other (residual)	26.4%	27.5%	27.8%	26.6%	23.8%	25.3%

Note: Percentages are not age-standardized.

References

Anderson, S. A. (1990). Core indicators of nutritional state for difficult-to-sample populations. *The Journal of Nutrition, 120*(11S), 1557-1600.

Arias, E. (2011). United States life tables, 2007. *National Vital Statistics Reports, 59*(9).

Bell, J., & Lee, M. M. (2011). *Why place and race matter: Impacting health through a focus on race and place*. Retrieved from PolicyLink website: http://www.policylink.org/atf/cf/%7B97c6d565-bb43-406d-a6d5-ca3bbf35af0%7D/WHY%20PLACE%20AND%20RACE%20MATTER_FULL%20REPORT_WEB.PDF

Bhandari, H., & Yasunobu, K. (2009). What is social capital? A comprehensive review of the concept. *Asian Journal of Social Science, 37*(3), 480-510.

Braveman, P. (2011). Accumulating knowledge on the social determinants of health and infectious disease. *Public Health Reports, 126*(3 Suppl), 28-30.

Braveman, P., Cubbin, C., Egerter, S., Chideya, S., Marchi, K., Metzler, M., & Posner, S. (2005). Socioeconomic status in health research: One size does not fit all. *Journal of the American Medical Association, 294*(22), 2879-2888.

Cacioppo, J., & Hawkley, L. (2003). Social isolation and health, with an emphasis on underlying mechanisms. *Perspectives in Biology and Medicine, 46*(3 Suppl), S39-S52.

Centers for Disease Control and Prevention. (2010). *Behavioral Risk Factor Surveillance System survey data.* Atlanta, GA: U.S. Department of Health and Human Services.

Cohen, D. (2010). Parks and physical activity: Why are some parks used more than others? *Preventive Medicine, 50*(Suppl 1), S9-S12.

Commission on Social Determinants of Health. (2008). *Closing the gap in a generation: Health equity through action on the social determinants of health*. Retrieved from the World Health Organization website: http://whqlibdoc.who.int/publications/2008/9789241563703_eng.pdf

Diez Roux, A. V. (2001). Investigating neighborhood and area effects on health. *American Journal of Public Health, 91*(11), 1783-1789.

Farquhar, S. A., Michael, Y. L., & Wiggins, N. (2005). Building on leadership and social capital to create change in 2 urban communities. *American Journal of Public Health, 95*(4), 596-601.

Gordon-Larsen, P., Nelson, M. C., Page, P., & Popkin, B. M. (2006). Inequality in the built environment underlies key health disparities in physical activity and obesity. *Pediatrics, 117*(2), 417-424.

Hutch, D. J., Bouye, K. E., Skillen, E., Lee, C., Whitehead, L., & Rashid, J. R. (2011). Potential strategies to eliminate built environment disparities for disadvantaged and vulnerable communities. *American Journal of Public Health, 101*(4), 587-595.

Institute of Medicine, Committee on Health and Behavior. (2001). *Health and behavior: The interplay of biological, behavioral and societal influences.* Washington, DC: National Academy Press.

Joint Center for Housing Studies of Harvard University. (2011). *The state of the nation's housing*. Retrieved from http://www.jchs.harvard.edu/sites/jchs.harvard.edu/files/son2011.pdf

Kneebone, E., Nadeau, C., & Berube, A. (2011). *The re-emergence of concentrated poverty: Metropolitan trends in the 2000s*. Retrieved from Brookings website: http://www.brookings.edu/~/media/Files/rc/papers/2011/1103_poverty_kneebone_nadeau_berube/1103_poverty_kneebone_nadeau_berube.pdf

Kim, D., Subramanian, S. V., & Kawachi, I. (2006). Bonding versus bridging social capital and their associations with self-rated health: A multilevel analysis of 40 US communities. *Journal of Epidemiology and Community Health, 60,* 116-122.

LaVeist, T. A., Gaskin, D. J., & Richard, P. (2009). *The economic burden of health inequalities in the United States*. Retrieved from Joint Center for Political and Economic Studies website: http://www.jointcenter.org/hpi/sites/all/files/Burden_Of_Health_FINAL_0.pdf

Lee, V., Mikkelsen, L., Srikantharajah, J., & Cohen, L. (2011). *Promising strategies for creating healthy eating and active living environments*. Retrieved from Convergence Partnership website: http://www.convergencepartnership.org/atf/cf/%7B245a9b44-6ded-4abd-a392-ae583809e350%7D/PROMISING%20STRATEGIES-07.18.11.PDF

Lochner, K., Kawachi, I., Brennan, R., & Buka, S. (2003). Social capital and mortality rates in Chicago. *Social Science & Medicine, 56*(8), 1797-1805.

Ludwig, J., Sanbonmatsu, L., Gennetian, L., Adam, E., Duncan, G., Katz, L. F., . . . McDade, T. W. (2011). Neighborhoods, obesity and diabetes – a randomized social experiment. *New England Journal of Medicine, 365*, 1509-1519.

McMurray, M. (2009). *Population notes: Minnesota population projections by race and Hispanic origin, 2005 to 2035.* Retrieved from the Minnesota State Demographic Center website: http://www.demography.state.mn.us/documents/MinnesotaPopulationProjectionsbyRaceandHispanicOrigin2005to2035.pdf

Minnesota Department of Health. (2010). *Social connectedness: Evaluating the Healthy People 2020 framework – The Minnesota Project*. Retrieved from http://www.health.state.mn.us/divs/cfh/ophp/resources/docs/socialconnectedness.pdf

Mitchel, C., & LaGory, M. (2002). Social capital and mental distress in an impoverished community. *City & Community, 1*, 195-215.

Policy Research Initiative. (2003). *Social capital: A tool for public policy*. Retrieved from Policy Horizons Canada website: http://www.horizons.gc.ca/doclib/R4_PRI%20SC%20Briefing%20Note_E.pdf

Rodriguez, D. A., Khattack, A. J., & Evensaon, K. R. (2006). Can new urbanism encourage physical activity?: Comparing a new urbanist neighborhood with conventional suburbs. *Journal of the American Planning Association, 72*(1), 43-54.

Taylor, W. (2011). *Do all children have places to be active? Disparities in access to physical activity environments in racial and ethnic minority and lower-income communities*. Retrieved from Active Living Research website: http://www.activelivingresearch.org/files/Synthesis_Taylor-Lou_Disparities_Nov2011.pdf

Uchino, B., Cacioppo, J., & Kiecolt-Glaser, J. (1996). The relationship between social support and physiological processes: A review with emphasis on underlying mechanisms and implications for health. *Psychological Bulletin, 119* (3), 488-531.

Weiss, L., Ompad, D., Galea, S., & Vlahov, D. (2007). Defining neighborhood boundaries for urban health research. *American Journal of Preventive Medicine, 32*(6 Suppl), S154-S159.