The Health of Minnesota

Statewide Health Assessment

April 2012

Minnesota: People and Place • The Opportunity for Health • Healthy Living

MINNESOTA MDH DEPARTMENT OF HEALTH

Minnesota Department of Health &
Healthy Minnesota Partnership
PO Box 64975 | 625 Robert Street N
Saint Paul, MN 55164-0975
Phone: (651) 201-5000
www.health.state.mn.us/healthymnpartnership

The Health of Minnesota

2012 Statewide Health Assessment

For the electronic version of this document and for ***Part Two*** (disease and injury data), visit the Minnesota Department of Health website: www.health.state.mn.us/statewidehealthassessment. ***The Health of Minnesota: Statewide Health Assessment*** was produced in collaboration by the Minnesota Department of Health and the Healthy Minnesota Partnership. Partial funding for this project was provided by the Office of Disease Prevention and Health Promotion, U.S. Department of Health and Human Services, through John Snow, Inc. (JSI), July 2011-June 2012. This publication was supported by the Cooperative Agreement Number CD10-1011 from the Centers for Disease Control and Prevention. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the Centers for Disease Control and Prevention.

Upon request, this material will be made available in an alternative format such as large print, Braille or cassette tape.

Minnesota Department of Health and Healthy Minnesota Partnership
PO Box 64975 | 625 Robert Street N | Saint Paul, MN 55164-0975
Phone: (651) 201-5000 | Online: www.health.state.mn.us/healthymnpartnership

Introduction

Minnesota is a great place to live, and Minnesotans are on average among the healthiest people in the nation. Businesses and industries thrive here, too, and the lakes, fields, forests and rivers in the state provide a beautiful backdrop for everyday activities. Many individuals and organizations throughout the state share the mission of protecting, maintaining and improving these conditions and the health of Minnesotans.

This document presents an assessment of health in Minnesota, in the broadest sense of that concept. Health is defined by the World Health Organization as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."[1] This kind of health is not just about individuals, but includes families, communities and systems, and is a result of the interaction of complex networks of conditions and factors. This kind of health starts long before illness is manifest: it begins in homes and schools, in jobs and workplaces, and in communities. Ultimately, it reflects the 1988 Institute of Medicine mission of public health, "fulfill[ing] society's interest in *assuring the conditions* in which people can be healthy [emphasis added]."[2]

To reflect this understanding of health, ***The Health of Minnesota*** discusses a wide array of indicators and information about the conditions and factors affecting health, as well as indicators of health status. The assessment is presented in two parts: ***Part One*** provides information about physical, social, and behavioral *factors* for health in Minnesota; ***Part Two*** presents data on health *outcomes* related to disease and injury.

The Healthy Minnesota Partnership

Minnesota's statewide health assessment was prepared under the auspices of the Healthy Minnesota Partnership, a multi-sector group of community leaders.* The Partnership is charged with developing innovative public health priorities, goals, objectives and strategies to improve the health of all Minnesotans, and to ensure ownership of these priorities and strategies in communities across the state. ***The Health of Minnesota*** is the first step toward fulfilling this charge, and provides the basis for creating a ***Healthy Minnesota 2020*** statewide health plan. The Partnership hopes that assessing and addressing a broad array of health-related conditions and factors will change the conversation around health, energize the public, private and nonprofit sectors, and create a groundswell of community efforts to improve health in every Minnesota community.

Public Input

A draft of ***The Health of Minnesota*** was made available for review and feedback online during January and February 2012. The Healthy Minnesota Partnership was instrumental in encouraging their constituencies to review the document. Over 100 responses were collected through the online survey, making thoughtful and helpful suggestions for improving the

* *Partners range from state agencies to communities of color, local public health, elected officials, nonprofits, health care providers and the community. Please visit the Appendix for a list of Healthy Minnesota Partnership members.*
† *"Emerging concern" indicates to health officials the importance of staying abreast of new or changing health or*

document. In addition, the Healthy Minnesota Partnership received several letters from constituent groups offering additional analysis and identifying issues of their particular concern. The comments and suggestions received were incorporated into ***The Health of Minnesota*** wherever possible.

Limitations

While this statewide health assessment presents many important issues and topics, it does not present every possible health-related issue. The issues and indicators chosen are intended to reveal the scope and complexity of population health, but space does not allow for each of them to be thoroughly documented. Therefore, the assessment should not be considered a formal study or research document investigating the causes of each issue raised or providing a detailed analysis of the data. Volumes have been written on many of these issues, and references are provided throughout to enable access to additional information.

In some cases, information that could greatly inform a statewide health assessment is simply not available. This may be because data are not available at the state level, or data are not stratified by race/ethnicity, income, sexual orientation, etc. When race/ethnicity data are gathered, analysis may be further limited due to a lack of data stratification by more specific racial categories, such as U.S.-born vs. African-born for the African-American population, or the many ethnicities and cultures represented in the category of Asian-Pacific Islander.[3] In other cases, especially when it comes to understanding the interactions of the many factors that contribute to health, data are lacking in part because the theoretical models are still being developed.

The assessment also does not include the many programs, services, and strategies that are currently (or could be) implemented to address these health-related issues, either by the Healthy Minnesota Partnership, by the Minnesota Department of Health, or by other stakeholders. The statewide health assessment is not, in other words, Minnesota's statewide health plan; that document called ***Healthy Minnesota 2020*** will follow later in 2012.

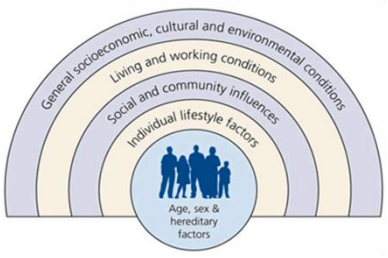
A Framework for Assessing Health

Health starts long before illness is manifest: it begins in homes and schools, in jobs and workplaces, and in communities.

Health is a product of many conditions and factors. Nationally and internationally, a growing body of research is showing how living conditions and social and economic opportunity determine health outcomes.[4]

It can be difficult to visualize the broad factors that influence health. Dahlgren and Whitehead[5] propose the model at right, in which the individual with unique biological characteristics is surrounded by community, place, and system-based conditions and factors. A similar model, called the ecological or social ecology model, is used in a variety of academic and practice fields in order to better understand the larger forces that impact individuals.[6]

Conditions and factors for health



Source: Dahlgren, G., & Whitehead, M. (1991).

The movement from an understanding of health focusing on the individual to one focused on communities and systems health also is evident in the development of *Healthy People*, the national agenda for health developed by the U.S. Department of Health and Human Services.

Healthy People 2020 Overarching Goals

- Attain high-quality, longer lives free of preventable disease, disability, injury, and premature death
- Achieve health equity, eliminate disparities, and improve the health of all groups
- Create social and physical environments that promote good health for all
- Promote quality of life, healthy development, and healthy behaviors across all life stages[7]

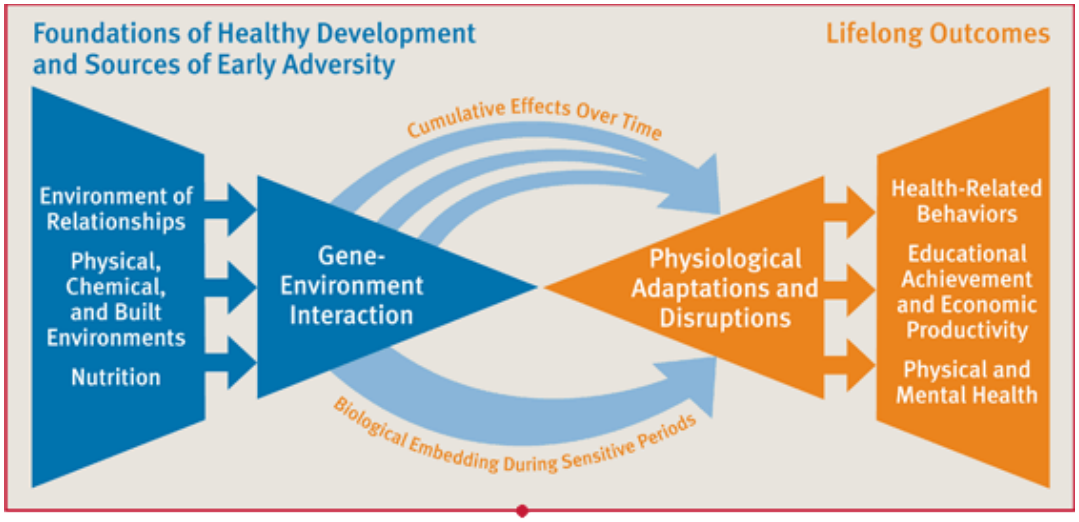
The U.S. Department of Health and Human Services describes similar factors that influence the development of a healthy community:

> *"[A healthy community is] one that continuously creates and improves both its physical and social environments, helping people to support one another in aspects of daily life and to develop to their fullest potential. Healthy places are those designed and built to improve the quality of life for all people who live, work, worship, learn, and play within their borders—where every person is free to make choices amid a variety of healthy, available, accessible, and affordable options."* [8]

Clearly, a number of complex and subtle interrelationships among many conditions and factors affect health. For example, an individual's level of education is associated with the likelihood that s/he smokes, and a higher risk of cancer is correlated with smoking. However, it is also important to acknowledge the role other factors play on a person's likelihood of becoming and staying a smoker: level of education influences his/her occupation, which influences his/her overall stress level, which influences his/her interpersonal relationships, which influences his/her likelihood of smoking. Many factors circle around themselves in this way, influencing an individual's health in cyclical manners.

Childhood experiences seem to particularly influence a person's health in the immediate and distant future. Beneficial and harmful events in those early years, especially positive or negative interactions with adults, affect the biology of the body, and a person's entire life.[9]

How early experiences get into the body: A biodevelopmental framework



Source: Harvard University, Center on the Developing Child. (2010).[10]

Greater opportunities for health, beginning in childhood and continuing throughout life, lead to healthier living, which leads to better lifetime health.

It is both important and challenging to incorporate community, environment, and system factors into a statewide health assessment. Without recognizing the relationship among many factors, organizations cannot develop effective strategies to improve health, but integrating all relevant factors into a strategy can be challenging, time-consuming, and difficult to measure.

Organization

The Health of Minnesota highlights a variety of factors and conditions. The structure of the document developed from conversations within the Healthy Minnesota Partnership, in which the Partnership agreed that Minnesotans require the following to be healthy:

- A healthy start in life
- Supportive families, friends and communities
- Safe and welcoming places to live, learn, work, play, and worship
- Knowledge, with the freedom, capacity, and desire to act on that knowledge
- Fair employment and a living wage
- Access to systems designed to meet their needs (health care, public health, social safety net, transportation, and more)

Part One of this statewide health assessment reflects this broad way of thinking about health, and is organized around three major themes that reflect *conditions* and *factors* that assure health:

- **Minnesota: People and Place**: Who we are and our natural environment; the people of the state; and the air, water and land that surround them
- **The Opportunity for Health in Minnesota**: The social, economic, and community factors that have a potent influence on our health
- **Healthy Living in Minnesota**: The ways in which individuals and communities act to protect and improve health

Part Two of this assessment focuses on *outcomes* of health, including the diseases, conditions, and injuries that health-related strategies, programs, and services hope to prevent.

General Health Status

Minnesota is considered to be one of the healthiest states in the nation. The United Health Foundation has ranked states' overall health status since 1990, and for the first 18 years Minnesota consistently landed in the top five. In the last three years, however, Minnesota's rank has slipped to sixth, and remains there.

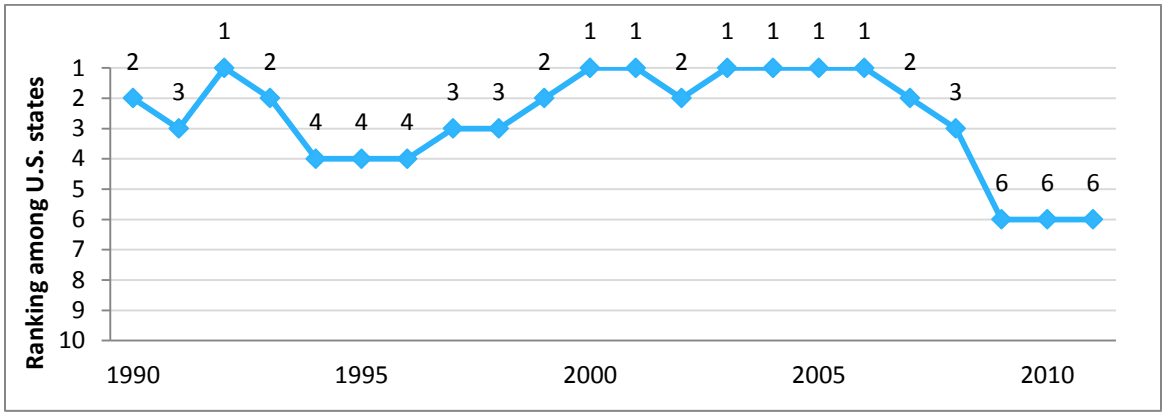
According to the 2011 *America's Health Rankings* report, Minnesota's strengths include:

- Low rate of death related to cardiovascular disease (Rank: 1)
- Low rate of uninsurance (Rank: 3)
- High rate of high school graduation (Rank: 3)

Challenges identified by the report include:

- Low rate of public health funding per capita (Rank: 46)
- High prevalence of binge drinking (Rank: 44)

Minnesota's overall health ranking in the United States: 1990-2011



In ranking states' overall health status, Minnesota has moved from first among states to sixth in the United Health Foundation's *America's Health Rankings*.

Source: United Health Foundation. (2011).[11]

The report also found that Minnesota ranks lower on determinants of health (that is, factors that influence a person's health) than on health outcomes (i.e., disease and injury), raising concern that the overall health of the state's population may decline over time as outcomes catch up with determinants.

Health Disparities and Health Equity

Reports like *America's Health Rankings*, which rely on overall averages, can obscure an important issue: health disparities. When it comes to the differences in health status between populations, Minnesota is far from equal. In reality, populations of color and American Indians in Minnesota experience higher rates of many chronic and infectious diseases and premature death.

Populations of color and American Indians in Minnesota experience higher rates of many chronic and infectious diseases and premature death.

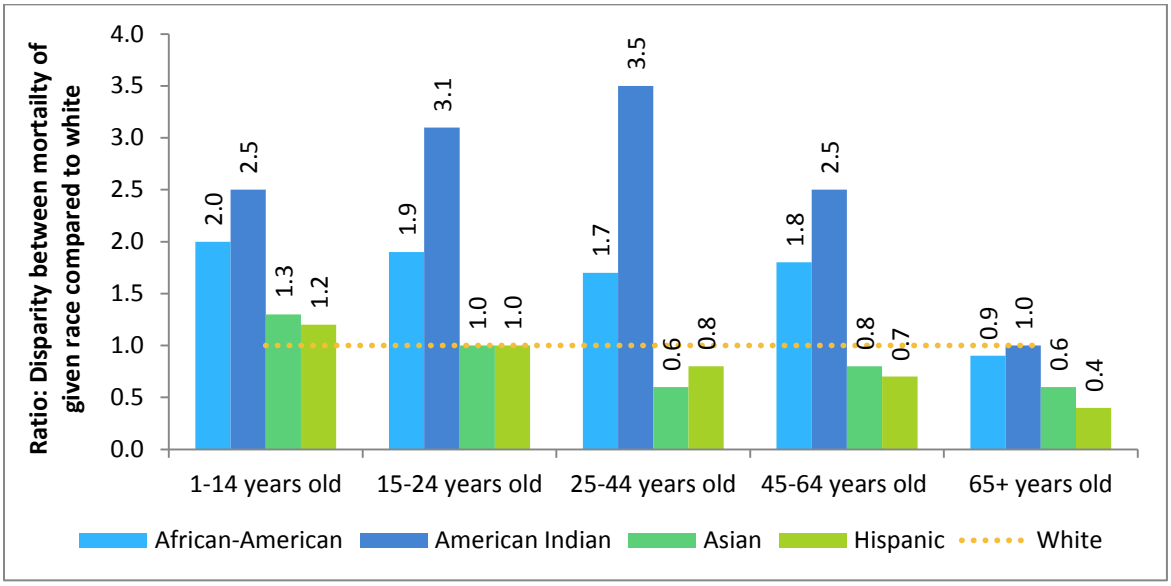
As noted above, health is not just the absence of disease, but a state of "well-being" in every aspect of life. That means that health starts in homes and schools, jobs and workplaces, and places of worship, socialization, and play. With this understanding of health, the sources of health disparities become more evident. Many Minnesotans, especially populations of color and American Indians, experience inequitable living conditions and unequal treatment in many aspects of life. Historical, institutional and personal racism have contributed greatly to these inequities, which in turn lead to poorer health status. Throughout this assessment, the data reveal that disparities in health status and health determinants are widespread and persist throughout a person's lifetime: from their education to their employment opportunities and subsequent income; from infant mortality to cancer rates to health care access; and from early childhood through adulthood.

These persistent inequalities in our state (in environment, opportunity, and healthy living) are demonstrated throughout this assessment, and are illustrated most starkly in a comparison of mortality rates by race and ethnicity. As illustrated in the chart and accompanying table below, the rate of death in the American Indian population, Minnesota's most historically established

population, is much higher than in the state's white population across all age groups except the elderly, and death rates in the African-American population are consistently nearly twice as high as the state's white population, aside from the elderly.[12]

American Indian and African-American Minnesotans experience substantially higher mortality rates at earlier ages.

Disparities* in mortality in Minnesota: 2006-2010



Age and Ratio:	1 – 14	15 – 24	25 – 44	45 – 64	65+
White	1.0	1.0	1.0	1.0	1.0
African-American	2.0	1.9	1.7	1.8	0.9
American Indian	2.5	3.1	3.5	2.5	1.0
Asian	1.3	1.0	0.6	0.8	0.6
Hispanic	1.2	1.0	0.8	0.7	0.4

**Disparity ratios are calculated by dividing the rate for a given population (African-American, American Indian, Asian or Hispanic) by another rate (white) for a selected health indicator to determine how much more likely a particular event is to occur in one population compared to another.*
Source: Minnesota Department of Health, Minnesota Center for Health Statistics. (2011).[13]

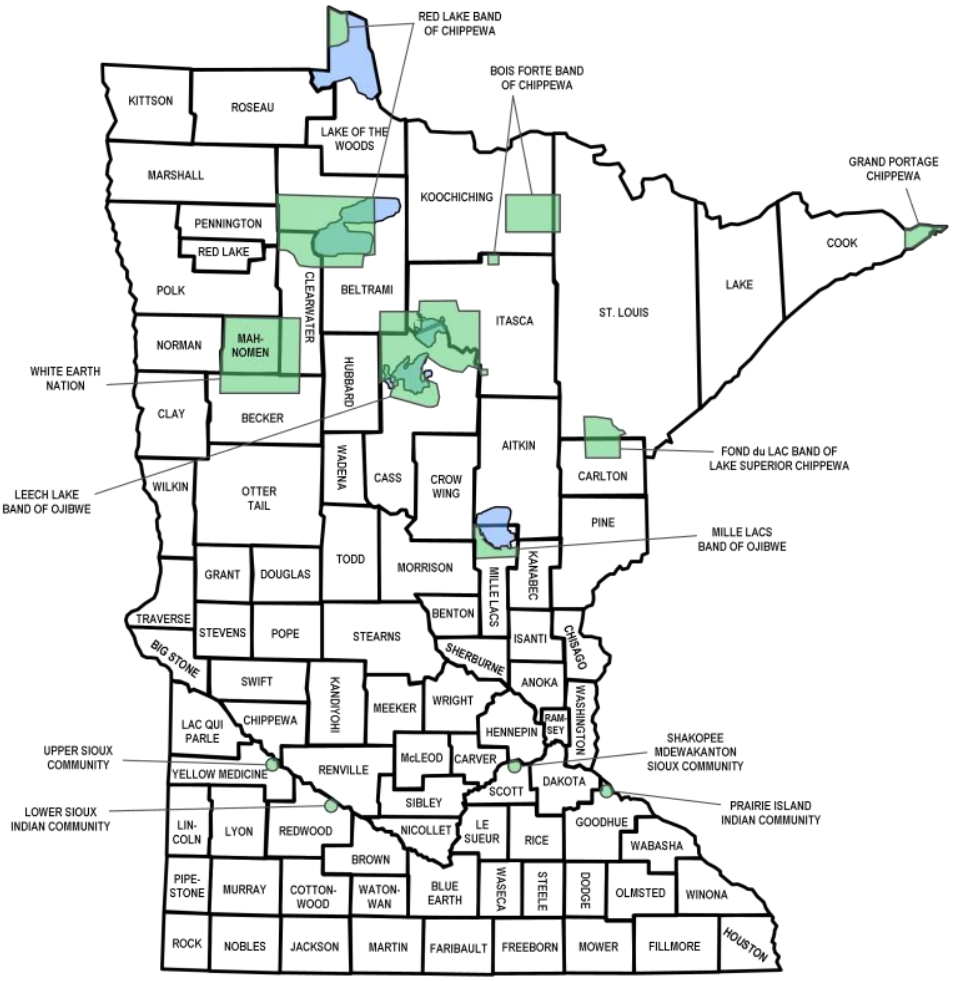
Minnesota: People and Place

Minnesotans represent every populated continent on the globe, and our faces reflect that diversity. Minnesota's geography is also diverse, and includes prairies, bluffs, forests, lakes, and rivers, including the mighty Mississippi. In northwestern Minnesota, residents say that one can "see the weather coming" across the rolling prairie, while southeastern Minnesota is sculpted in dramatic relief along the Mississippi and St. Croix river bluffs, and glacier-carved lakes and thick coniferous forests are scattered across the north of the state.

Minnesotans share an appreciation for the beauty of their state and the resourcefulness of their communities. This section, *Minnesota: People and Place*, discusses urban and rural population trends; immigration and the increasing diversity of the state's population; the state's changing age profile; Minnesota's water, weather and air; and the roads, bridges and walkways that connect Minnesotans to each other.

Urban and Rural Population Trends

Minnesota counties and tribal nations: 2012

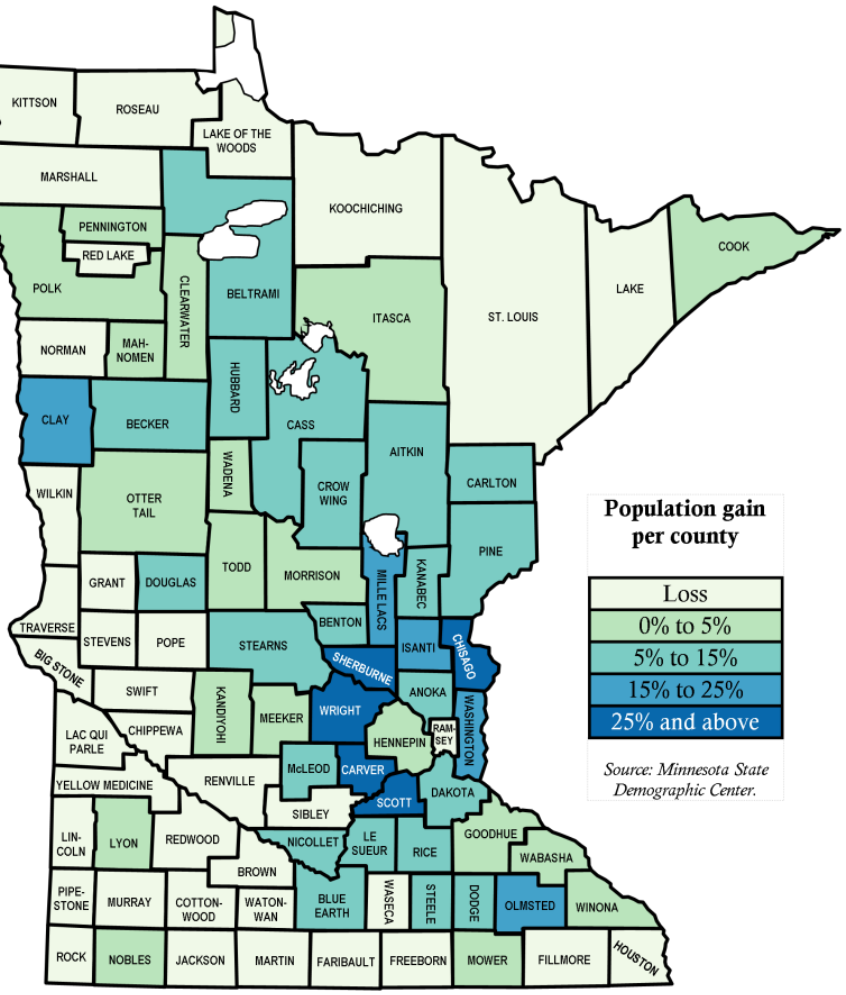


Geographically, Minnesota is largely a rural state. More than half of the state's population, however, resides in the Twin Cities metropolitan area in the east-central region of the state.

- Minnesota had 5.3 million total residents in 2010
- Minnesota is divided into 87 counties and contains 11 federally recognized American Indian tribes: seven Anishinaabe (Chippewa, Ojibwe) reservations and four Dakota (Sioux) communities
- Seven of the 10 largest cities are in the seven-county Twin Cities metropolitan area as of 2010: Minneapolis, 382,578; St. Paul, 285,068; Bloomington, 82,893; Brooklyn Park, 75,781; Plymouth, 70,576; Eagan, 64,206; Woodbury, 61,961. The other three largest cities are in the southeast (Rochester, 106,769); northeast (Duluth, 86,265); and central Minnesota (St. Cloud, 65,842)

Population change in Minnesota by county: 2000-2010

Populations in Minnesota's suburban counties have grown over the past decade, while the state's southwest and northern counties have lost the greatest number of residents.



Much about Minnesota is changing. Once very demographically homogenous, Minnesota's racial and ethnic diversity is increasing rapidly in some areas. People throughout Minnesota are developing a new and expanded sense of what it means to be Minnesotan. As the state's population ages, communities will be confronted with challenges and opportunities in meeting the unique needs of older Minnesotans.

Minnesota's population grew by 7.8 percent between 2000 and 2010 (at about the same rate as South Dakota, but faster than North Dakota, Wisconsin, or Iowa). Rural areas of the state, however, continue to lose population, while the population in areas surrounding the Twin Cities metropolitan area continue to grow rapidly.

Immigration and Growing Diversity

While Minnesota is still far from the most diverse state in the U.S., this is gradually changing. In 1990, populations of color and American Indians in Minnesota represented just over 6 percent of the total population. In 2010 that had grown to 15 percent. The Hispanic population grew by 364 percent during that time, and the African-American population grew by 189 percent. In 2025 the state's population of color is expected to be around 22 percent, and in 2035, if this trend continues, it will reach about 25 percent.[14]

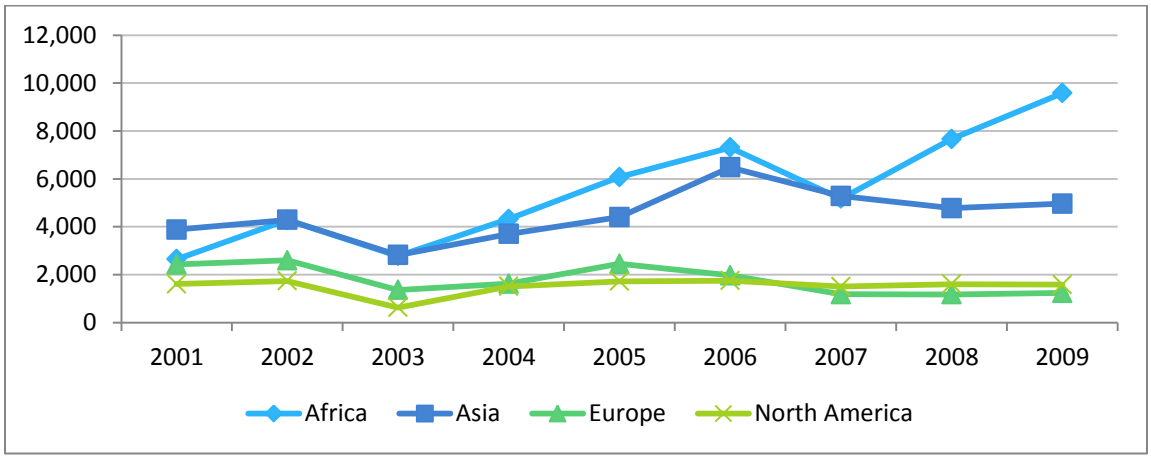
Populations of color in Minnesota have grown more rapidly in the past 20 years than the state's white population.

Populations of color as a proportion of Minnesota's total population: 1990-2010

	Proportion of Total Minnesota Population			Percent Growth
Race/Ethnicity	In 1990	In 2000	In 2010	of Population
African-American	2.2 %	3.5 %	5.2 %	189.0 %
American Indian	1.1 %	1.1 %	1.1 %	22.1 %
Asian	1.8 %	2.9 %	4.1 %	177.8 %
Hispanic	1.2 %	2.9 %	4.7 %	364.4 %
White	94.4 %	89.4 %	85.3%	9.5 %

Source: U.S. Census Bureau. (2011).[15]

Immigrants to Minnesota by continent of origin: 2001-2009



In Minnesota, the number of immigrants from Africa (particularly East Africa) has increased dramatically in the past decade.

Continent of Origin	2001	2002	2003	2004	2005	2006	2007	2008	2009
Africa	2,641	4,277	2,775	4,319	6,073	7,308	5,167	7,659	9,579
Asia	3,878	4,288	2,814	3,697	4,397	6,479	5,280	4,776	4,963
Europe	2,421	2,597	1,362	1,620	2,452	1,965	1,177	1,170	1,235
North America	1,606	1,736	626	1,510	1,723	1,750	1,502	1,599	1,581

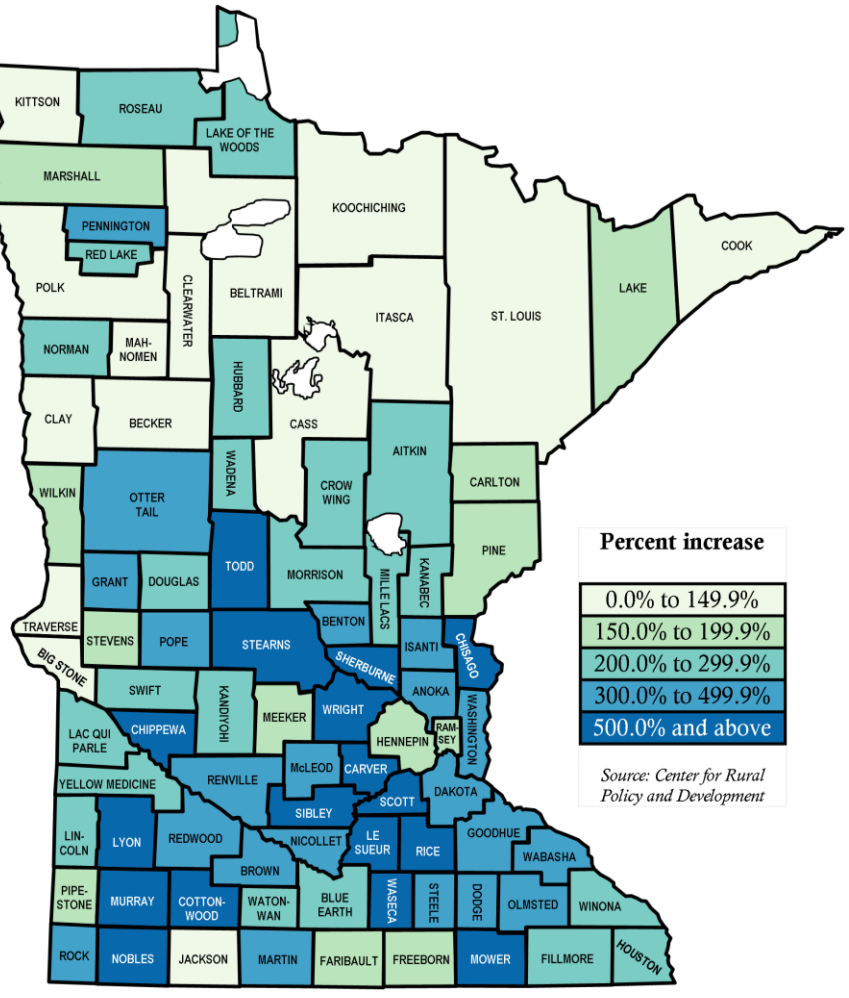
Source: U.S. Census Bureau. (2011).[16]

The state's diversity is increasing primarily through immigration. Minnesota attracts a wide range of immigrants to the state from other parts of the U.S. and from other countries, who move here to attend school, start businesses, work in Minnesota industries, and join family members.

Minnesota's diversity is quite varied when considering places of origin. Minnesotans include new residents from Mexico, Laos, Somalia, Vietnam, Canada, Ethiopia, Korea, Liberia, Germany, Burma, and Bhutan, to name just a few. This diversity within racial and ethnic categories (especially from Asia and Africa) presents nearly as many challenges as diversity within the whole population: for example, at least 19 different countries are represented among Asian immigrants to Minnesota. The peoples from these areas bring a wide range of backgrounds, experiences, cultural practices, languages, and unique health concerns to Minnesota.[17]

It is also important to remember that Minnesota's growing racial and ethnic diversity is not limited to the Twin Cities metropolitan area. The southwestern region of Minnesota, in particular, has experienced a dramatic increase in immigrant populations.

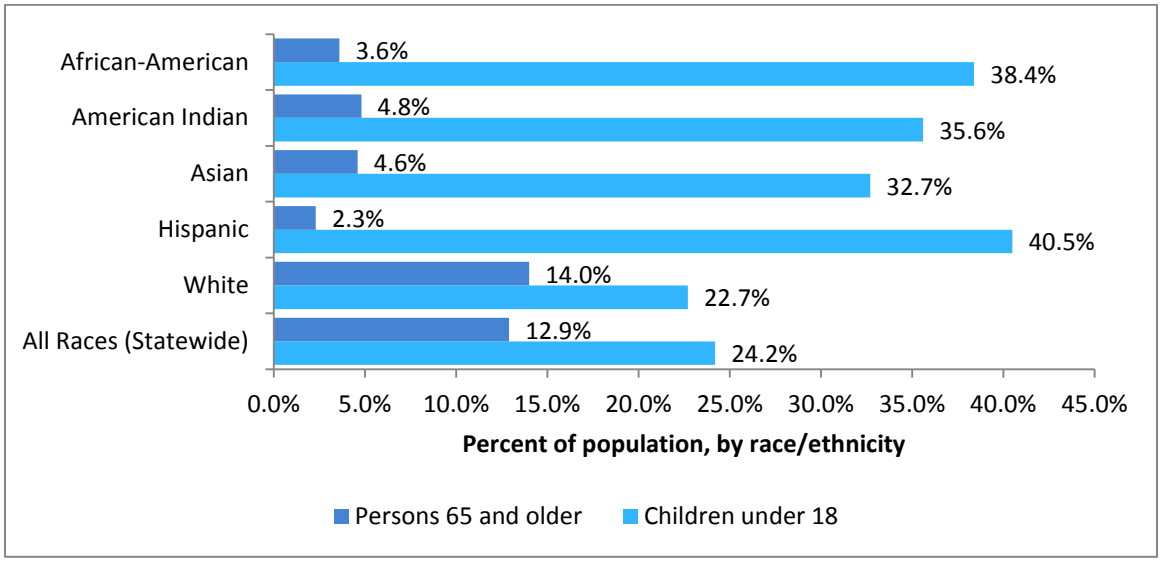
Change in the distribution of people of color in Minnesota: 1990-2010



Immigrant groups, on average, tend to be younger than the state's white population, in part because of the age of the immigrants themselves, and also because they often have more children. This is also true of Minnesota's populations of color: more than one-third of each population of

color and American Indians in Minnesota are younger than 18, while only one-fourth of the state's white population is comprised of children.

Population age distribution in Minnesota: 2010

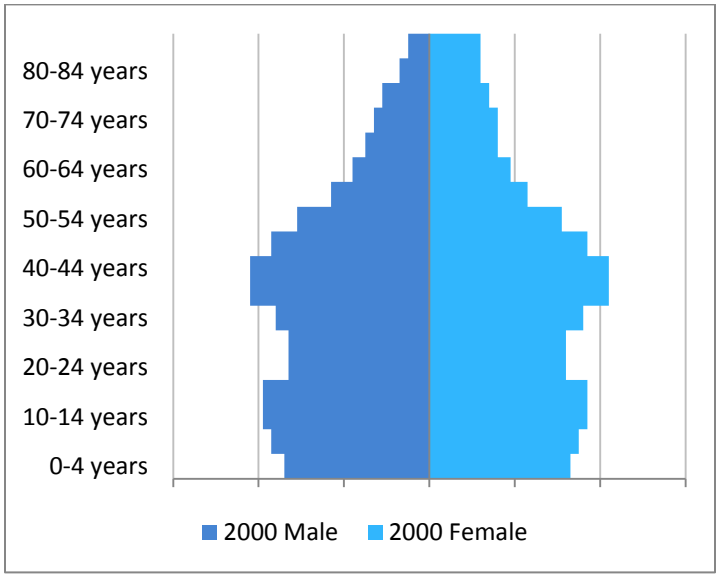


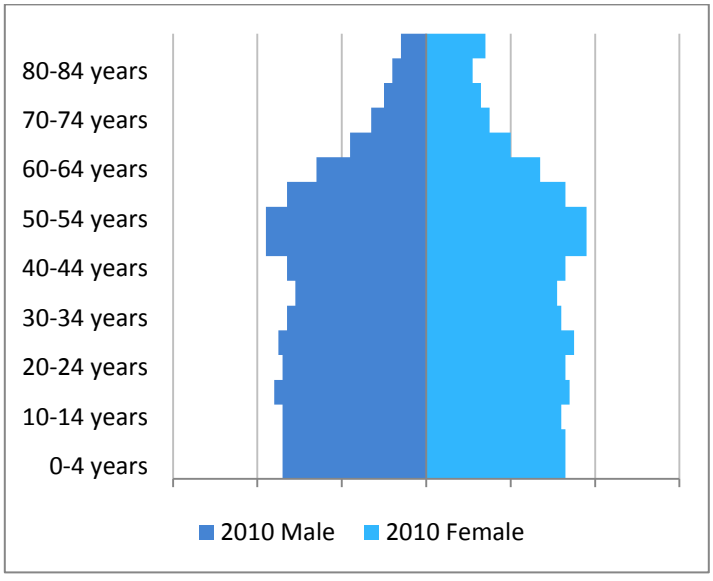
Source: U.S. Census Bureau. (2011).[18]

Aging and Retirement

Both Minnesota and the U.S. have aging populations. From 2000 to 2010, the proportion of Minnesotans under the age of 45 decreased by 2 percent while the proportion of persons 45 and over increased by 27 percent; the proportion of the state's population over 65 will increase as the baby boomer generation continues to move toward retirement age. The largest increases in Minnesota's population from 2000 to 2010 were to age groups 50 years and older.

Minnesota's changing population: 2000, 2010



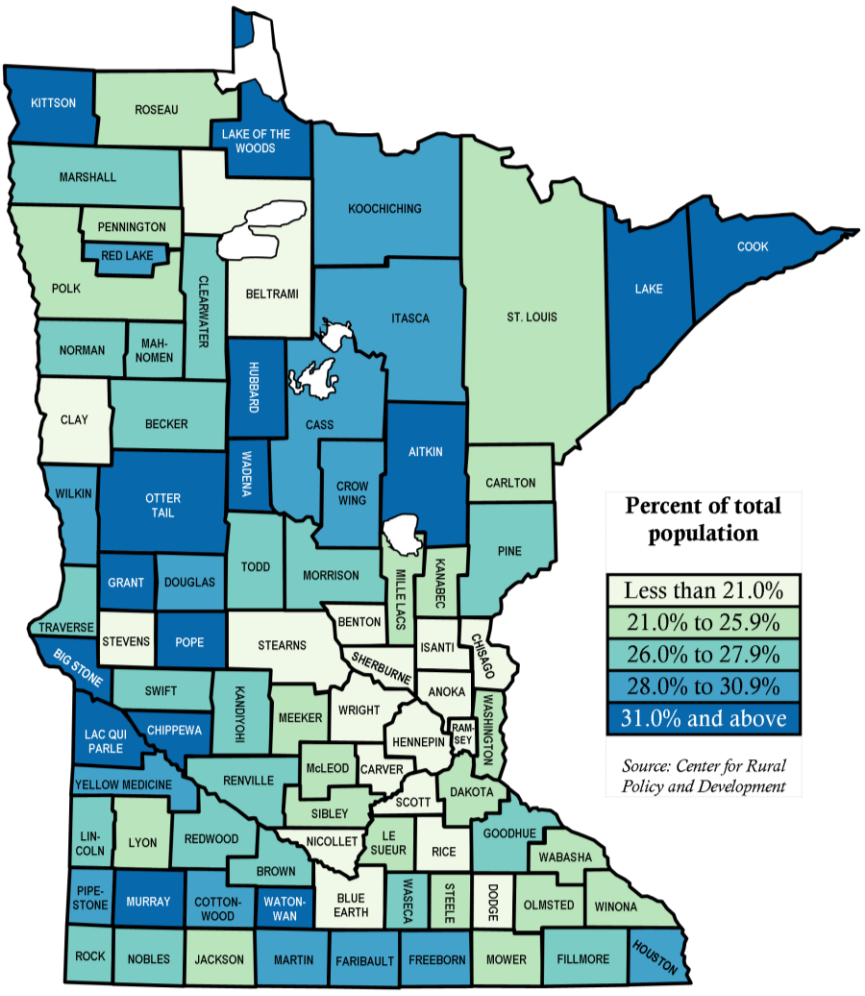


	2000 Male	2000 Female	2010 Male	2010 Female
0-4 years	3.4%	3.3%	3.4%	3.3%
5-9 years	3.7%	3.5%	3.4%	3.3%
10-14 years	3.9%	3.7%	3.4%	3.2%
15-19 years	3.9%	3.7%	3.6%	3.4%
20-24 years	3.3%	3.2%	3.4%	3.3%
25-29 years	3.3%	3.2%	3.5%	3.5%
30-34 years	3.6%	3.6%	3.3%	3.2%
35-39 years	4.2%	4.2%	3.1%	3.1%
40-44 years	4.2%	4.2%	3.3%	3.3%
45-49 years	3.7%	3.7%	3.8%	3.8%
50-54 years	3.1%	3.1%	3.8%	3.8%
55-59 years	2.3%	2.3%	3.3%	3.3%
60-64 years	1.8%	1.9%	2.6%	2.7%
65-69 years	1.5%	1.6%	1.8%	2.0%
70-74 years	1.3%	1.6%	1.3%	1.5%
75-79 years	1.1%	1.4%	1.0%	1.3%
80-84 years	0.7%	1.2%	0.8%	1.1%
85+ years	0.5%	1.2%	0.6%	1.4%

Source: U.S. Census Bureau. (2011).[19]

This is especially true in rural areas of Minnesota, in which the aging population is expected to grow more substantially than that in the Twin Cities metropolitan area. The proportion of older residents is expected to be largest in Minnesota's rural western and northern counties.

Projected population age 65 and over in Minnesota: 2035



Water, Weather, and the Air

Minnesota is a beautiful and geographically diverse state.

- The total land area of Minnesota is 79,610 square miles (or nearly 51 million square acres)
- Minnesota has 58 state forests (totaling almost 4 million square acres), 72 state parks, and thousands of lakes (see below)
- The state's seasons include mild, wet springs; dry autumns; humid summers; and cold, snowy winters—with a great deal of variation within each of these seasons

Water

In the language of the state's indigenous Dakota, *minne* means water, and *Minnesota* means water that reflects the sky. Minnesota is rich in water resources, with nearly 12,000 lakes over 10 acres, more than 6,500 natural rivers and streams traveling 69,000 miles, and 9.3 million acres of natural wetlands. Six percent of the state is covered with this water that reflects the sky—more than any other state.

The health of the water and that of the people of Minnesota are closely linked. Monitoring water quality for health involves protection of the natural environment as a source of drinking water, and regulation of the built environment that delivers water to Minnesota residents and creates potential sources of contamination.

Area covered by water in Minnesota

Total area covered by lakes and rivers (deep water)	2,560,299 acres
Total surface water area, including wetlands	13,136,357 acres

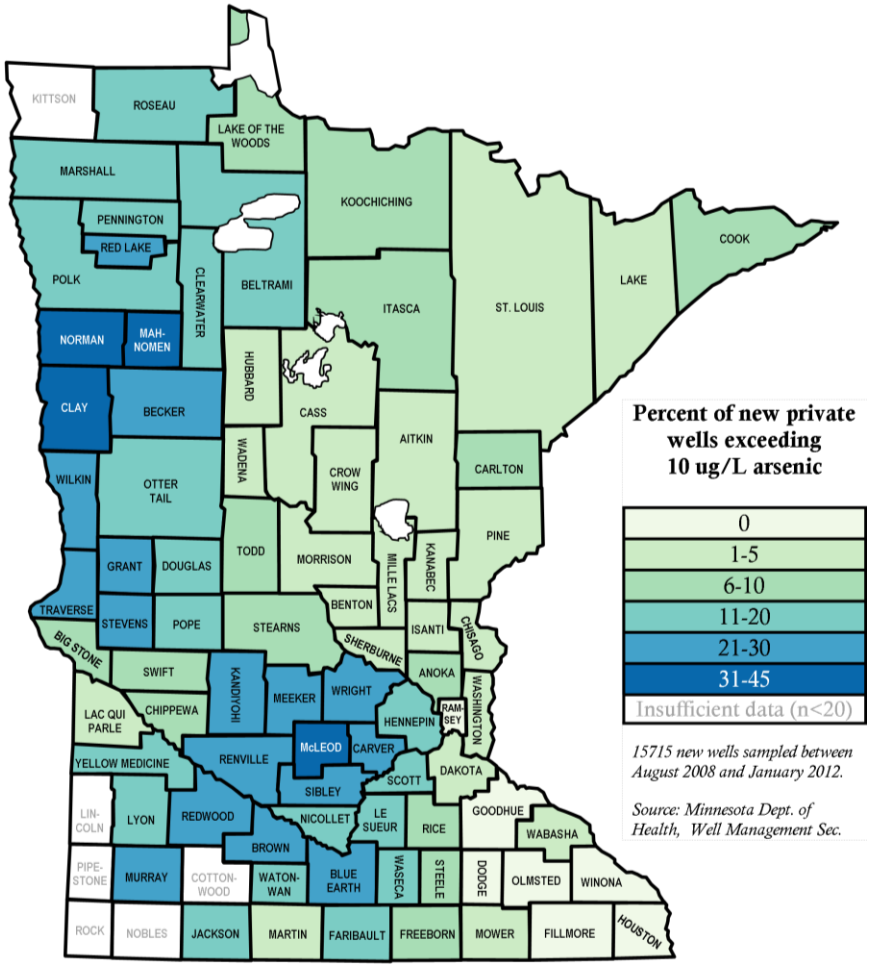
Source: Minnesota Department of Natural Resources. (2008).[20]

Drinking water comes from either a surface source (i.e., water found above ground in rivers, lakes, and streams) or a groundwater source (i.e., water found in underground aquifers, in the pores between sand, clay, and rock formations). Approximately 70 percent of all Minnesotans rely on groundwater as their primary source of drinking water, and 1 million Minnesotans rely on private wells. While most of the state has access to abundant groundwater, the geology of southwestern and northeastern Minnesota limits the amount of groundwater available for domestic use and economic development. In some parts of the Twin Cities metropolitan area, increasing consumer and commercial demand reduces groundwater stores enough to pose a serious challenge for the future.

Drinking water can be contaminated by man-made chemicals or by natural sources like heavy metals in rock and soil. While existing in nature, water contains impurities and most are harmless; however, at certain levels, some bacteria, minerals, and man-made chemicals can make drinking water harmful to health. Primary groundwater quality concerns in Minnesota include naturally occurring arsenic and radium, and human-influenced pesticides, fuel oils, industrial chemicals, and sources of nitrate (e.g., fertilizers, animal wastes, human sewage).[21]

Based on existing monitoring data, it is now estimated that about 10 percent of all private wells in Minnesota have arsenic levels of 10 µg/L or more.[22]

High arsenic and private wells in Minnesota: 2008-2012



In addition to these known contaminants, Minnesota's water supplies may also contain contaminants of emerging concern[†] like endocrine disrupting chemicals, prescription and non-prescription pharmaceuticals intended for humans and livestock, additives to personal care and consumer products, and some current-use pesticides. State government agencies become concerned if appropriate human health-based drinking water guidance for these substances is unavailable, or when new information about these substances suggests that the health risks from exposures should be reexamined.

Weather and Climate

Minnesota typically has cold, snowy winters and hot, humid summers. Temperature extremes can create health challenges, especially for elderly residents and for those with special health concerns. Minnesota's normal temperatures range from an average low of 6°F in the winter, to an average high of 70°F in the summer (with an average of 83°F in July). Minnesota also receives anywhere from 18 to 36 inches of liquid precipitation (in rain and snow) each year. These

[†] *"Emerging concern" indicates to health officials the importance of staying abreast of new or changing health or exposure information on these contaminants.*

averages, however, mask the range of extremes experienced by Minnesota from year to year, including blizzards and heat waves.[23]

Climate change and the ensuing effects on weather patterns may also affect health in Minnesota. Weather data for Minnesota show a trend toward increasing warmth, especially in recent decades, and Minnesota has seen more frequent heavy downpours, record-breaking spring floods, and a decrease in the thickness of lake ice in recent years.[24] Four of the five warmest years on record have occurred in the last 10 years. Five heat episodes in the summer of 2011 resulted in National Weather Service warnings or advisories for Minnesota counties. [25] Unusually warm summers reduce air quality, exacerbate pollution, increase insect populations (as well as rates of tick-borne disease[‡]), and affect water quality. Extreme heat events are particularly concerning for vulnerable populations, including those 65 and older, children under five, people living in poverty, and individuals with pre-existing conditions like allergies or asthma.

Consistently higher summer temperatures also foster increased insect populations and the increased potential for the spread of disease by insects, while flooding increases breeding grounds for disease-carrying insects and increases the potential for waterborne infections.

Precipitation and temperature in Minnesota: As of 2008

Measure	Location and Amount	
Average annual precipitation	Northwest: 19 inches/year	Southeast: 34 inches/year
Average annual snowfall	Northeast: 70 inches/year	Southwest: 35 inches/year
Average spring temperature	North: 36°F	South: 44°F
Average summer temperature	North: 60°F	South: 70°F
Average fall temperature	North: 38°F	South: 46°F
Average winter temperature	North: 6°F	South: 16°F
Warmest temperature on record	114°F in Beardsley (West Central); July 29, 1917 114°F in Moorhead (Northwest); July 6, 1936	
Coldest temperature on record	-60°F near Tower (Northeast); February 2, 1996	

Source: Minnesota Department of Natural Resources. (2008). [26]

Air Quality

Radon

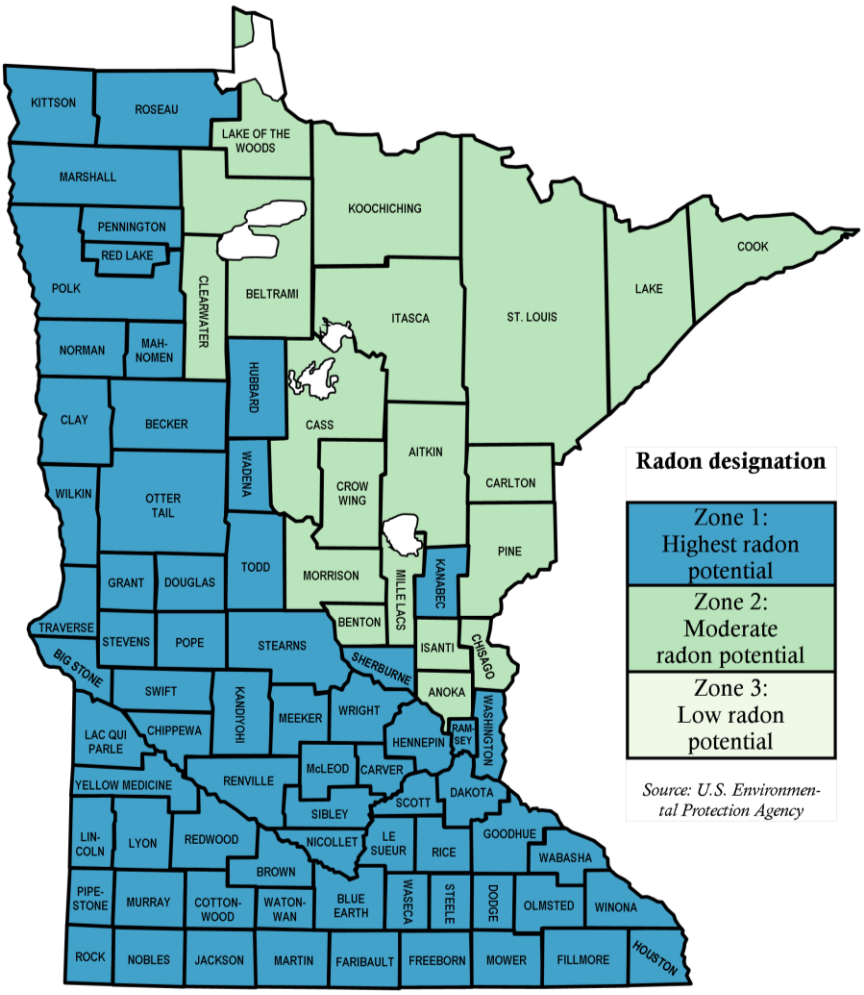
Radon is the most critical air quality issue in Minnesota, especially in homes and living spaces. It is a colorless, odorless gas that occurs naturally in the environment, and is the leading cause of lung cancer among non-smokers. There is no safe level of radon for humans. The risk for lung cancer increases with more concentrated levels of radon gas and increased exposure.

Radon seeps from the earth and enters homes in a variety of ways, such as through cracks in floors and walls, construction joints, or gaps around service pipes. In Minnesota, one of every three homes has radon levels at levels that pose a significant health threat (over 4 pCi/L). All Minnesota counties are designated as either High or Moderate Radon Zones.[27]

[‡] *For more information on rates of tick-borne disease, please refer to* ***Supplement: Disease and Injury****.*

Radon zones in Minnesota: 2011

All Minnesota counties have high or moderate radon exposure potential.



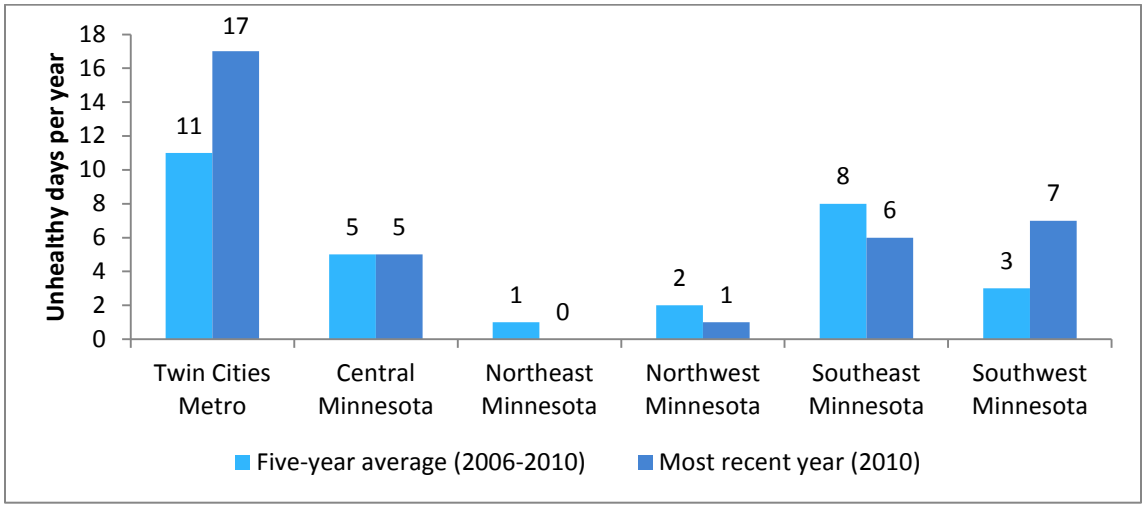
Air Pollution

Air pollutants can affect health, the environment, and individuals' quality of life. Fossil fuel-based power plants, motor vehicles, lawn and garden equipment, paints and solvents, and fires are all common sources of air pollution. Elevated levels of air pollutants may cause respiratory diseases or cancer, and can affect health in other ways.

Outdoor pollutants contribute to odors and smog, diminish the protective ozone layer, and contribute to other environmental problems like acid rain and global climate change. Indoor pollutants like mold, radon, tobacco smoke, carbon monoxide, and chemical emissions from products and furnishings are some of the important pollutants that may be present in homes, schools, buildings, and other indoor environments.

Residents throughout the state experience a large number of unhealthy air quality days, although the Twin Cities metropolitan area experiences the greatest number of unhealthy days. The high number of unhealthy air quality days in 2010 in the Twin Cities was likely the result of an unusually calm and stagnant winter (which can allow pollution levels to build to potentially unhealthy levels), and likely not the result of changes in air pollution emissions.

Unhealthy air quality days in Minnesota: 2006-2010 average and 2010



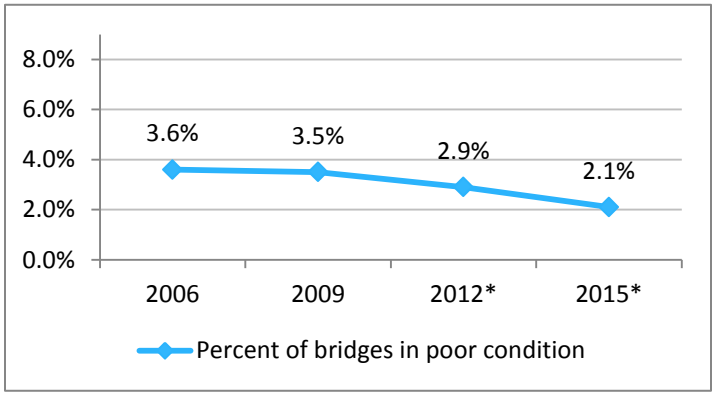
Residents throughout the state experience a large number of unhealthy air quality days, although the Twin Cities metropolitan area experiences the greatest number of unhealthy days.

Unhealthy air quality days occur when the Air Quality Index (AQI) reaches a level that is harmful for sensitive groups, including people with respiratory or cardiovascular disease, children, the elderly, and people participating in activities that require heavy or extended exertion. Source: Minnesota Pollution Control Agency. (2012).[28]

Roads, Highways, and Bridges

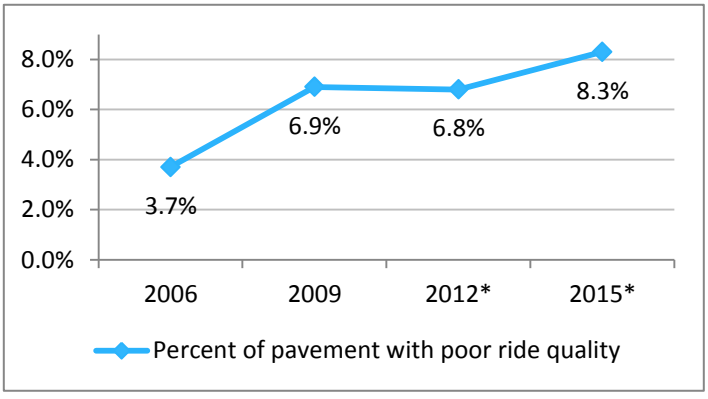
Minnesota's network of roads, highways, railways, and bridges forms an integral part of the landscape, and the transportation infrastructure has a significant influence on the state's environment for health. Nearly every Minnesotan comes into daily contact with roads, highways and bridges in order to reach the places he or she lives, works, and learns. Experiences on these roadways can affect mental health (e.g., scenic drives, smooth travel, the stress of heavy traffic, aggressive or unsafe drivers) as well as physical health (e.g., physical activity, air pollution, noise, unsafe driving conditions, injury).

State bridges in Minnesota in poor condition, historical and projected(*): 2006-2015



Denotes state principle arterial bridges in poor condition by principle arterial square footage.
Source: Minnesota Department of Transportation. (2011).[29]

Poor pavement ride quality in Minnesota, historical and projected(*): 2006-2015



Denotes state principle and non-principle arterials with poor pavement ride quality.
Source: Minnesota Department of Transportation. (2011).[30]

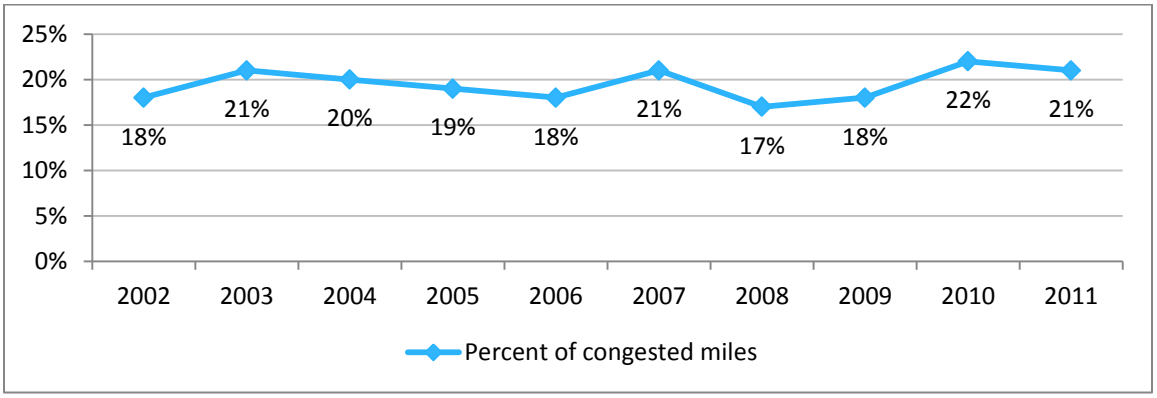
The integrity of Minnesota's transportation infrastructure is important, therefore, for health. In 2011, just over 3 percent of bridges on state principal arterial roads were in poor condition. By 2015, only 2 percent of bridges are expected to be in poor condition. Nationally, Minnesota has the fourth lowest percentage of bridges classified as structurally deficient or functionally obsolete; less than half the national average.[31]

State pavement condition has been declining due to age and competing investment needs. After significant improvement in 2010, only about 7 percent of state trunk highway miles in Minnesota were in poor condition. However, even with significant planned investments, poor pavement conditions are expected to increase to over 8 percent of state trunk highway miles by 2015.[32]

Traffic congestion also plays a major role in the daily lives of many people in the state, especially in the Twin Cities metropolitan area. More than 50 percent of roadway travel in the state occurs on the 13 percent of roadway miles in the Twin Cities. The region's congestion delay compared to other major metropolitan areas also can affect economic competitiveness. Effective management of traffic congestion improves the economy, quality of life, safety, and air quality.

Twin Cities freeway congestion decreased slightly in 2011 (to 21 percent), but this is still among the highest levels of the last decade.

Congested urban freeway miles in the Twin Cities, Minnesota: 2002-2011



Source: Minnesota Department of Transportation. (2012).[33]

For more information on the role of transportation in health status, please refer to the section of this assessment titled "The Opportunity for Health in Minnesota."

The Opportunity for Health in Minnesota

Opportunities for health among Minnesota residents begin within their families, neighborhoods, workplaces, and schools, where Minnesotans live, love, worship, play, work, and learn. A growing body of research shows that entire communities benefit when that community's members invest together in the opportunity to be healthy.

Minnesotans often do not share the same opportunities for health, however, depending on their race, ethnicity, income, and geography, among other factors. For example, Minnesotans of color and American Indians have more limited access to the kinds of opportunities for health discussed in this section: a high school education, employment, housing and home ownership, healthy outdoor and indoor environments, social connectedness, community and personal safety, and access to health care and public health.

Education and Employment

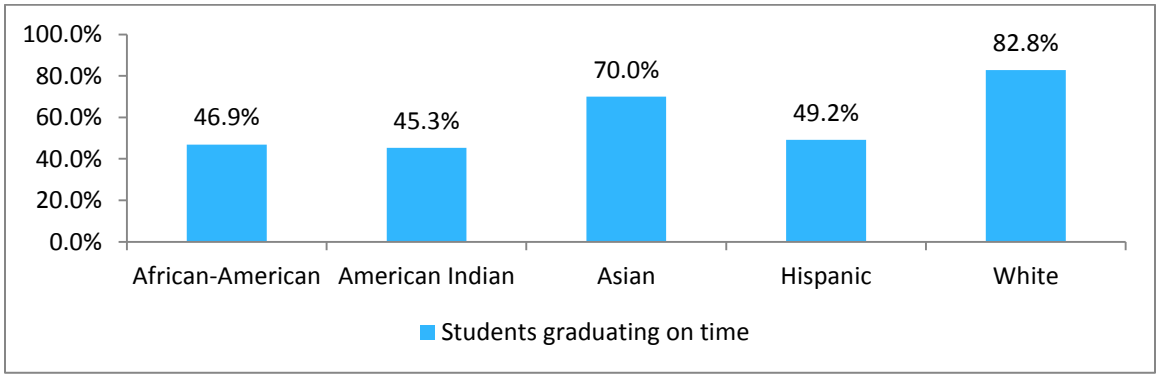
Education

Health and learning are closely connected. Education is an important predictor of health because it both shapes and reflects multiple factors that affect people's life chances. Investing in education can be "the single most effective intervention we can make to improve health outcomes and tackle inequities."[34]

Health affects learning at all ages, from early childhood through adolescence, to adulthood. Early reading and literacy stimulate brain development in young learners, help develop their analytical and communication skills, and influence their intellect and behavioral patterns. These in turn shape future opportunities and achievement.

Certain health behaviors, too, are strongly associated with education. For example, 33 percent of Minnesotans who do not have a high school degree smoke, compared with 25 percent of high school graduates, 21 percent of those with some post-secondary education, and 9 percent of college graduates.[35]

Minnesota high school students graduating on time: 2010



Minnesota's white and Asian students graduate from high school at a higher rate than students of other races/ ethnicities.

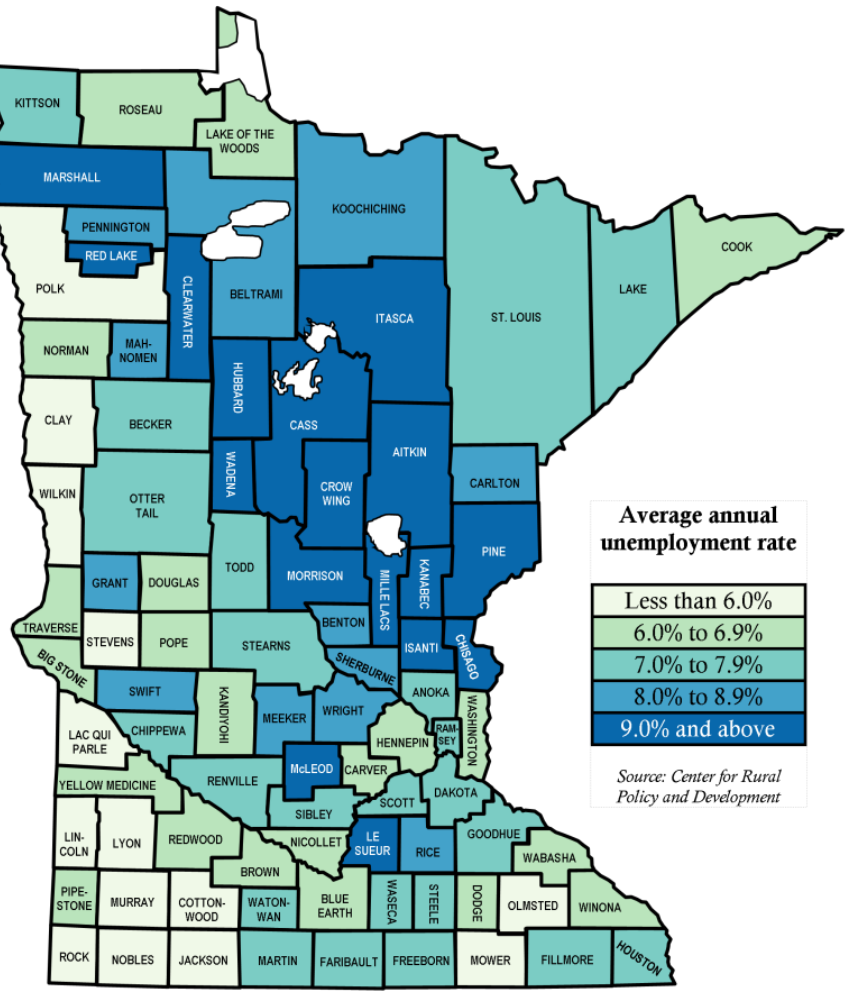
Source: MN Compass, Minnesota Department of Education. (2011).[36]

High school graduation rates are a consistent marker of education opportunity among Minnesota's various populations. In 2010, the four-year rate of high school graduation was highest for white and Asian populations and lowest for American Indian and African-American populations.

Employment

Education is one gateway to employment. Stable and secure employment influences health not only by being a source of income, but by providing access to health insurance.

Average annual unemployment in Minnesota: 2010



Unemployment and Racial Disparities

Significant disparities in employment persist in Minnesota, especially in the Twin Cities area. A recent analysis of unemployment in the nation's largest metropolitan areas shows that the Minneapolis-St. Paul-Bloomington census division currently experiences the worst relative unemployment disparity between African-Americans and Caucasians in the United States. This same census area has the second-highest rate of African-American unemployment in the country: 20.4 percent.[37]

Unemployment disparities in U.S. metropolitan areas: 2009

Metropolitan Area	*Unemployment Rate* African-American	White	Ratio: African-American to White	Difference: African-American and White
Minneapolis-St. Paul-Bloomington	20.4 %	6.6 %	3.1	13.8
Memphis	15.7 %	5.1 %	3.0	10.5
St. Louis	17.3 %	8.4 %	2.1	9.0
New York-North New Jersey-Long Island	14.2 %	6.7 %	2.1	7.5
Miami-Fort Lauderdale-Pompano Beach	15.4 %	8.0 %	1.9	7.4

Source: Economic Policy Institute. (2010).[38]

Minnesota adults in the labor force: 2010

	16-64 in Labor Force*	16-64 Working	Percent Working
White	2,499,966	2,311,369	92.5%
African-American	124,011	100,499	81.0%
American Indian	24,221	19,555	80.7%
Asian	103,729	93,375	90.0%
Hispanic	116,320	103,202	88.7%

** For civilian population only. Labor force is defined as those employed and unemployed.*
Source: U.S. Census Bureau, American Community Survey. (2011).[39]

A higher percentage of Minnesota's white, Asian, and Hispanic populations are employed than the state's American Indian and African-American populations.

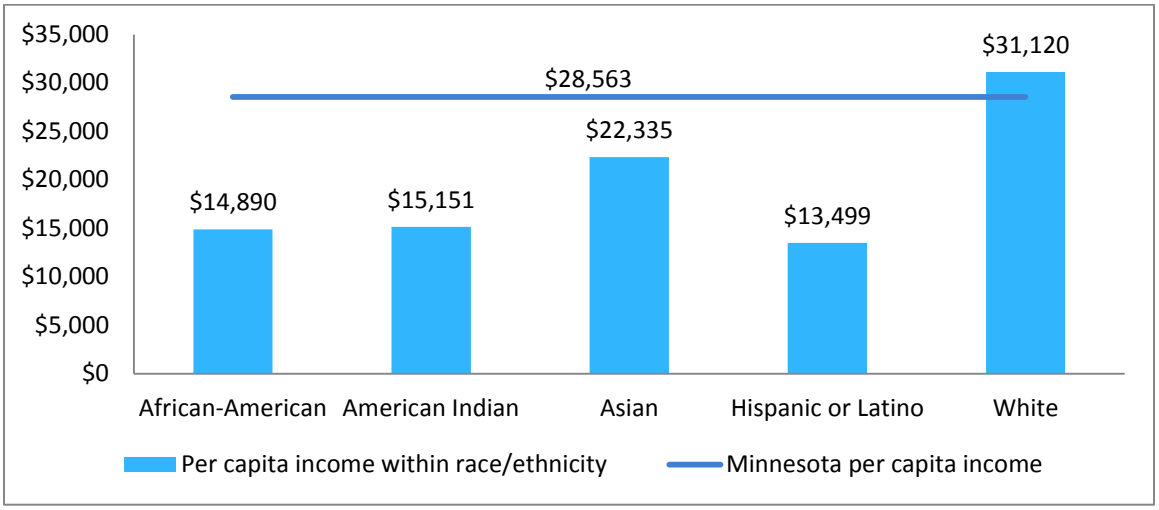
Income and Poverty

Income

Employment is important, yet income involves more than money earned from a job. It also includes assets (like a bank account or equity in an owned home) and access to a variety of economic resources. Income influences the opportunity people have to choose where to live, to purchase nutritious food, to participate in a wide variety of physical activities, especially those that require fees or special equipment, and to have leisure time. Jobs and job-related income, however, remains a steady marker of one aspect of a household's wealth. In Minnesota, African-American and American Indian populations have household incomes that are almost half that of Asian and white populations.

Per capita income in Minnesota: 2010

Average per capita income for African-American and Hispanic households is less than half the average per capita income for white households.



Source: U.S. Census Bureau, American Community Survey. (2011).[40]

Poverty

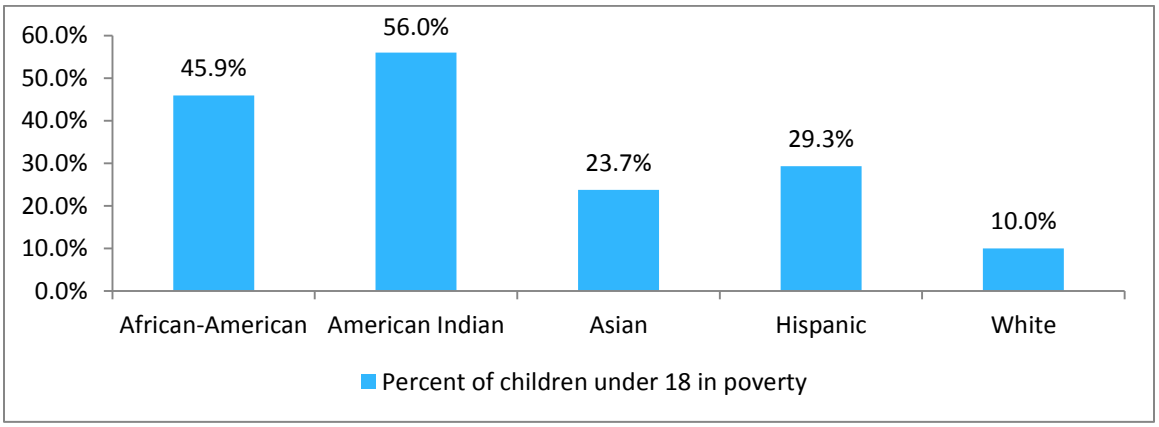
Poverty, often resulting from limited income or a lack of income, is linked to health in many ways. Poverty limits choices: in education, in employment, and in living conditions, among others. Poverty limits access to safe places to live, work, and play, and places to buy healthy food. Poverty can foster obesity by forcing people and families to rely on cheap sources of food, which tend to be plentiful but high in calories and low in nutritional value.

Poverty also is deepened by a lack of assets. Nearly two-thirds of African-American Minneapolis-St. Paul residents, compared with about one-fourth of the cities' white residents, live in 'asset poverty,' meaning they do not have enough assets to live above the poverty level for three months if they lose their main source of income.[41]

Children in Poverty

Poverty rate among Minnesota children under age 18: 2010

Minnesota children of color live in greater poverty than white children.



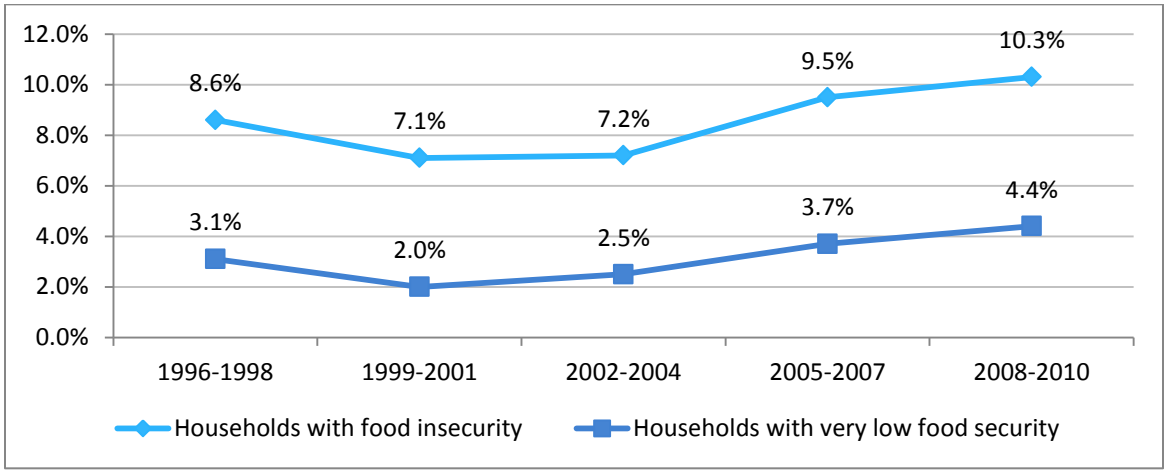
Source: U.S. Census Bureau, American Community Survey. (2011).[42]

A growing body of research is demonstrating that children who are raised in families experiencing chronic stress created by long-term poverty (<100% of the Federal Poverty Level) are at much greater risk of significant and long-term deficits in health.[43] Poverty among Minnesota's children is not evenly distributed. A far-greater percentage of children of color live in poverty than white children. And children who grow up in poverty are very likely to remain in poverty as adults.

Food Security

Food security means having enough to eat, and being able to make healthy food choices. Adequate nutrition is particularly important for children, as it affects their cognitive and behavioral development. Children from food insecure, low-income households are more likely to experience irritability, fatigue, and difficulty concentrating on tasks, especially in school, when compared to other children.

Food security* in Minnesota: 1996-2010 (three-year averages)



Ten percent of Minnesota households struggle to afford enough to eat.

** Denotes households experiencing food insecurity and very low food security.*
Source: U.S. Department of Agriculture, Economic Research Service. (2010).[44]

In 2010, more than 10 percent of Minnesota households struggled to afford enough to eat. Of these, just over 4 percent were categorized as "very low food security," meaning they sometimes skimped on meals, or completely skipped them, for lack of money. Because of the economic challenges of single parenting, single women with children are nearly twice as likely to experience food insecurity as married couples with children.[45]

Food insecurity is greater in rural Minnesota than in the metro area; some rural Minnesota counties have food insecurity rates of 12 to 14 percent.[46]

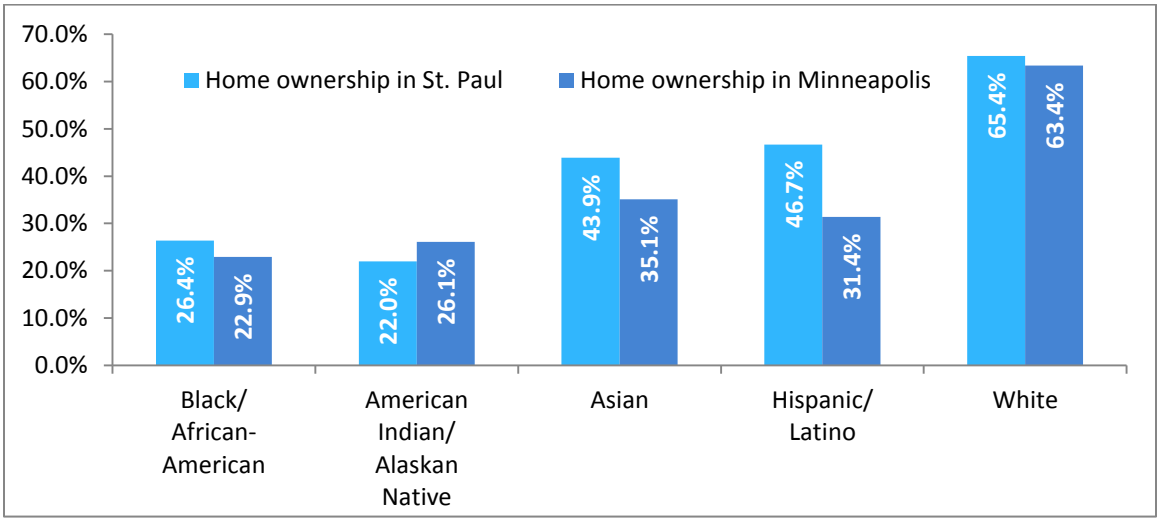
Housing and Home Ownership

As part of the built environment, housing is a key factor for health. Older housing in particular can present multiple threats to health, including lead-based paint, lead solder in plumbing and in the soil, mold, and asbestos. Minnesota's low-income families can often be found in older homes, as older homes are frequently more affordable.

Home ownership gives the occupants more control over their living environment, and can be a source of financial stability as an asset (home equity) that can be called on in a time of need. Home ownership also confers benefits on the community. Homeowners participate more in the civic and social life of their communities, help prevent and report crime, are more environmentally aware, and are more empowered to address environmental concerns in their homes and neighborhoods. Children benefit from residential stability when living in a permanent home, perform better in school, and have better health outcomes.[47]

Home ownership in St. Paul and Minneapolis, Minnesota: 2006-2008

The rate of home ownership among the Twin Cities metropolitan area's white population is more than double the rate of that in the area's African-American and American Indian populations.



Source: Corporation for Enterprise Development (CFED). (2011).[48]

Rates of home ownership vary widely by race and ethnicity in Minnesota. A recent analysis of Minneapolis and St. Paul revealed that more than 60 percent of the white population in the Twin Cities metropolitan area owns a home, but barely a quarter of the African-American and American Indian populations in Minneapolis and St. Paul are homeowners.[49]

Outdoor and Indoor Environments

Natural and man-made (or built) environments contribute to health in a variety of ways. For example, everyone needs clean water to drink and air that is safe to breathe, but people also need schools, workplaces, and homes that do not expose them to physical or chemical hazards, and places to walk and play outdoors that are clean and free of debris.

In some communities, the built environment can be overtly hazardous, such as living near a toxic waste dump. Because income affects housing choice and more polluted areas are less desirable, families with lower income may have no choice but to live in housing with indoor hazards like foundation cracks allowing radon seepage, lead paint, and asbestos in the building materials. Outdoor hazards affecting health can include dilapidated sidewalks or no sidewalks at all, which is often the case in rural areas, making it difficult and dangerous for residents to walk or children to ride bikes. Many areas do not have ready access to public transportation; air pollution can pose a hazard high near major roadways and thoroughfares; and a lack of parks and playgrounds will prevent children from playing safely and instead encourage sedentary activities indoors.

Transportation

According to *Healthy People 2020*,

> *"A healthy community is one in which people have access to healthy foods, feel safe, have opportunities for physical activity, breathe clean air, have access to gainful employment and feel connected to opportunity. Transportation is access, thus, transportation is opportunity."*[50]

Transportation links people and places, making it possible to get to work, for example, or to get from home to the grocery store. Transportation includes more than the state's roads, walkways, or bridges: it encompasses the state's public transit systems; policies that dictate the location and construction of roads; and guidelines for accommodating different kinds of users, for increasing physical activity, and for limiting the potential for driver, bicyclist, and pedestrian injury.

Environmental factors influencing physical activity in Minnesota and the United States: 2010

	Minnesota	United States
Percent of youth with parks, community centers, and sidewalks in neighborhood	53.9 percent	50.0 percent
Percent of census blocks with park within one half-mile of block boundary	17.7 percent	20.3 percent
Percent of census blocks with fitness center within one half-mile of block boundary	16.1 percent	16.6 percent

** MVPA: Moderate-to-vigorous physical activity. Source: Centers for Disease Control and Prevention. (2010).*[51]

One in five Minnesotans lives within walking distance of a park.

Walking provides a ready and inexpensive source of physical activity, thus community walkability is an important aspect of transportation. In a "walkable" community, residents are able to walk safely to school, neighbors, and shops. Walkable neighborhoods increase community-based activity and social connectedness. While in urban areas, crime, poor street lighting, and deteriorated sidewalks may pose barriers to walking, in suburban and rural communities distances are generally too great to walk, and there may be no sidewalks or other safe places to walk away from fast-moving traffic.

Parks and Playgrounds

Living near a park or playground is associated with higher levels of park use and physical activity among a variety of populations, especially youth. Similarly, having more parks and more park area (e.g., acreage) within a community is also associated with higher physical activity levels.

Lower-income populations and some racial and ethnic populations often have limited access to parks and recreational facilities in their neighborhoods, resulting in lower physical activity levels. If parks unpleasant or if they feel unsafe, neighborhood residents are less likely to use them. [52]

Lead, Mold, and Asbestos

Some of the most common hazardous substances in outdoor or indoor environments are lead, asbestos, and mold, as well as less common elements in radiation and carbon monoxide.

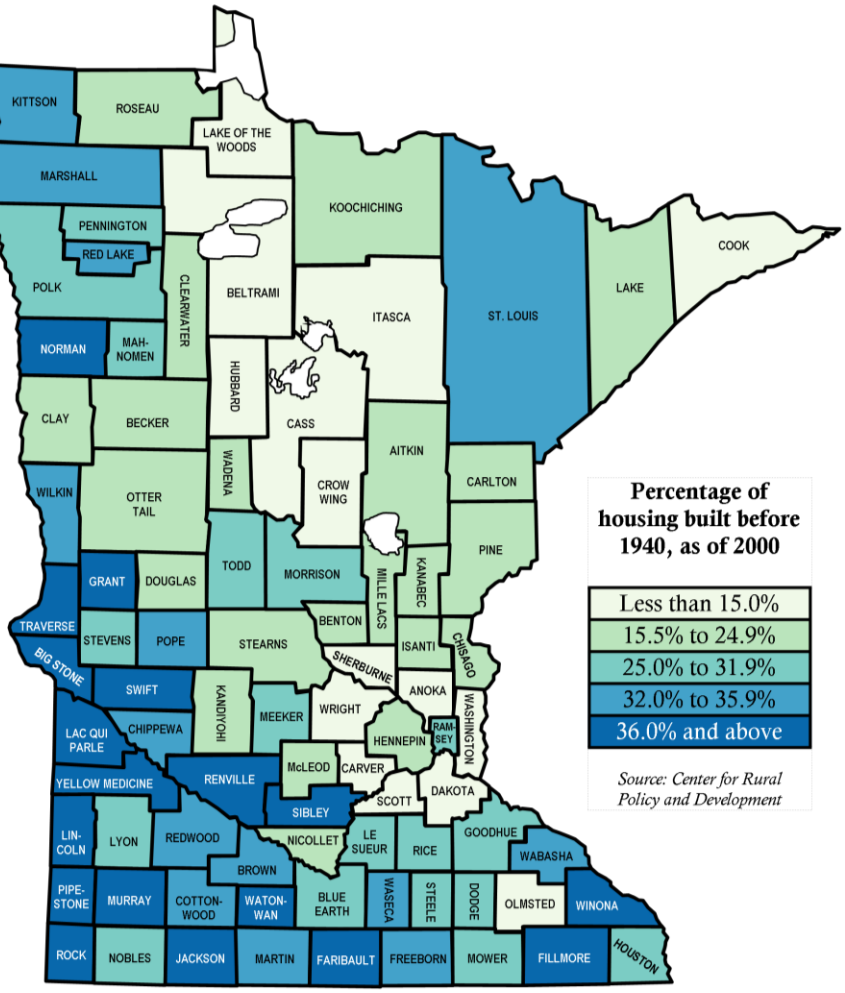
Lead

Minnesotans are exposed to lead in homes and in certain occupations (e.g., home remodelers, painters, workers in smelters or battery plants). Lead poisoning can cause learning, behavior and health problems in young children, and high blood pressure and kidney damage in adults.

Lead-based paint for household use was phased out of use beginning in the 1950s, and fully banned by 1978. Younger children (those less than six years of age) who spend time in homes with chipping or peeling paint built before 1978 are at the greatest risk of lead poisoning, for several reasons: their bodies absorb lead more easily, their brains are still developing, and they frequently put their hands and other objects into their mouths. Poverty is an additional factor for lead poisoning, as families of lower income are more likely to live in older, substandard housing.

Housing built before 1940 in Minnesota: As of 2000

A sizable proportion of the houses found in rural Minnesota are over 70 years old.



The older a home is, the more likely it is to contain lead-based paint. Paints containing up to 50 percent lead were used on the inside and outside of homes through the 1950s.[53] Older homes in the built environment are also a signal of economic decline, as populations decline and new homes are not built. The greatest percentage of pre-1940 homes are found in rural Minnesota.

Mold

Mold is a concern and a health hazard in many Minnesota homes, especially those damaged by flooding, disasters, or disrepair. Left unchecked, mold can cause respiratory problems, exacerbate asthma, and damage property. Increased heavy rainfalls and more frequent spring flooding also create more potential for mold problems in buildings throughout Minnesota.[54]

Asbestos

Significant exposure to any type of asbestos in the home or workplace can increase the risk of lung cancer, mesothelioma, and nonmalignant lung and pleural disorders, including asbestosis, pleural plaques, pleural thickening, and pleural effusions. Asbestos can be found in older homes and buildings where it was used as insulation and building materials.[55]

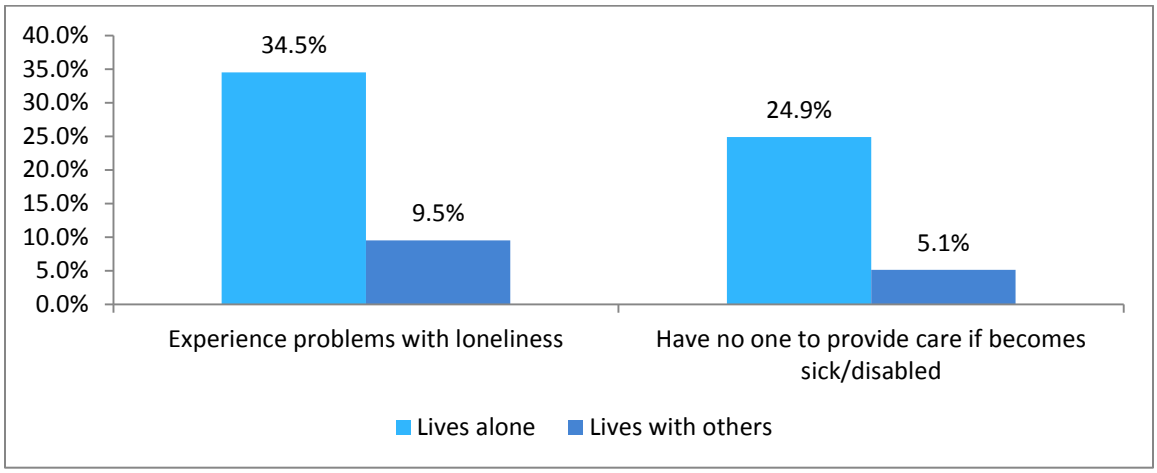
Social Connectedness

People at all stages of life need social connection for optimal health. People with strong social connectedness and healthy relationships with family, friends, and neighborhoods, and with their culture and heritage have higher quality lives and contribute to better functioning, more vibrant communities. Healthy social environments promote individual as well as environmental health, as communities come together to protect and enhance the quality of their surroundings. Likewise, a healthy physical environment supports strong social connections.[56]

Growing Older

Aging also brings challenges to social connectedness, such as loss of a life-partner, and reduced ability to leave the home. Minnesotans aged 50 and over who live alone are more at risk for loneliness and are less likely to have someone to care for them if they become sick or disabled. Approximately 30 percent of Minnesotans 65 and older lived by themselves in 2010.[57]

Characteristics of Minnesotans over age 50: 2005



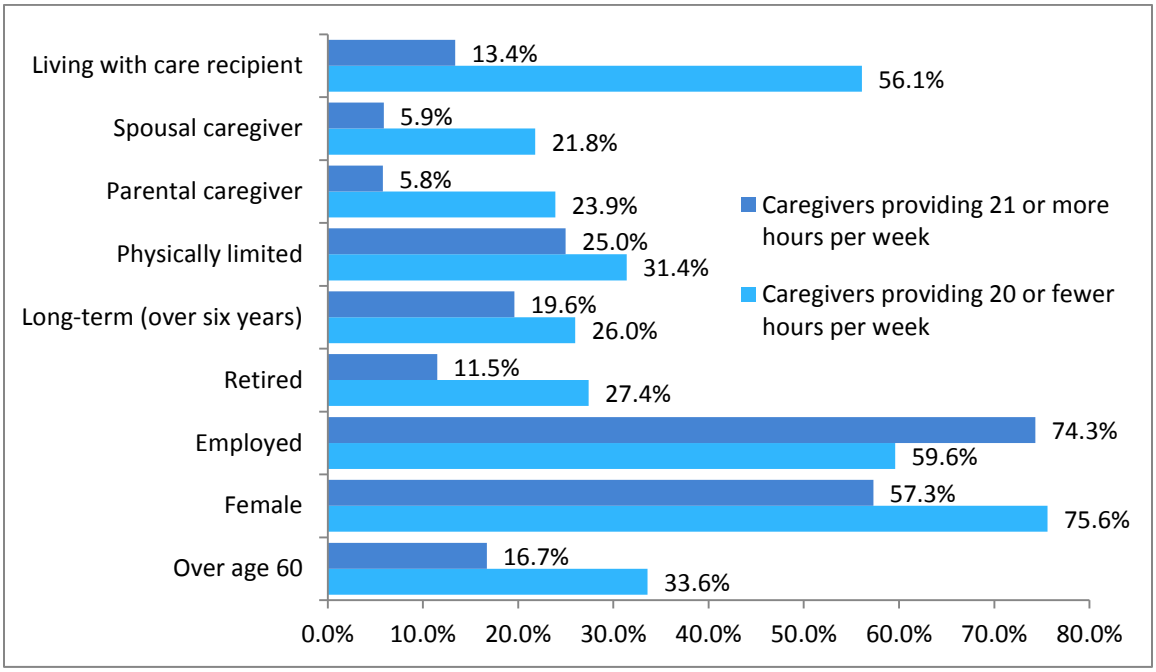
Minnesotans who live alone are more likely to experience loneliness, and may have no one to provide care if they become sick.

Source: Minnesota Board on Aging. (2005).[58]

Informal Caregivers

Minnesotans with chronic health conditions, physical disabilities, and cognitive impairment require a great deal of care. The majority of that care is provided at home by family members or other informal caregivers.

Characteristics of Minnesota's informal caregivers: 2008



Source: Centers for Disease Control and Prevention. (2009).[59]

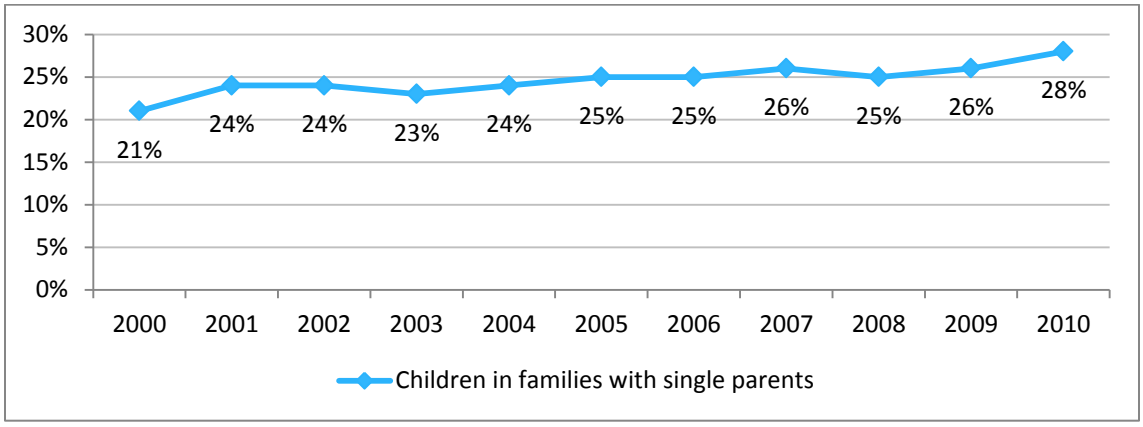
Most informal caregivers in Minnesota are female, between 45 and 64 years old, employed, and in good or excellent health, and most of them provide less than 10 hours of per week to their charges. However, an important subset of the state's informal caregivers—14 percent of them—provide between 21 and 40 hours of care per week, and 6 percent provide more than 40 hours per week of care. The caregivers that provide a larger amount of informal care are typically women, 60 or older, and caring for a child or spouse in their household with cognitive impairment or memory loss.[60]

As an informal caregiver's care load increases, her vulnerability to physical strain, emotional stress, and financial hardship also increases. She is more likely to report poor or fair health status, and limitations in activity due to physical, emotional, or mental problems.

Single-Parent Families

Both adults and children in households with a single parent are at greater risk for adverse health outcomes and unhealthy behaviors. These households are especially susceptible to chronic stress (often due to economic factors), social isolation, and stigma related single-parent families.[61]

Minnesota children in families with single parents: 2000-2010



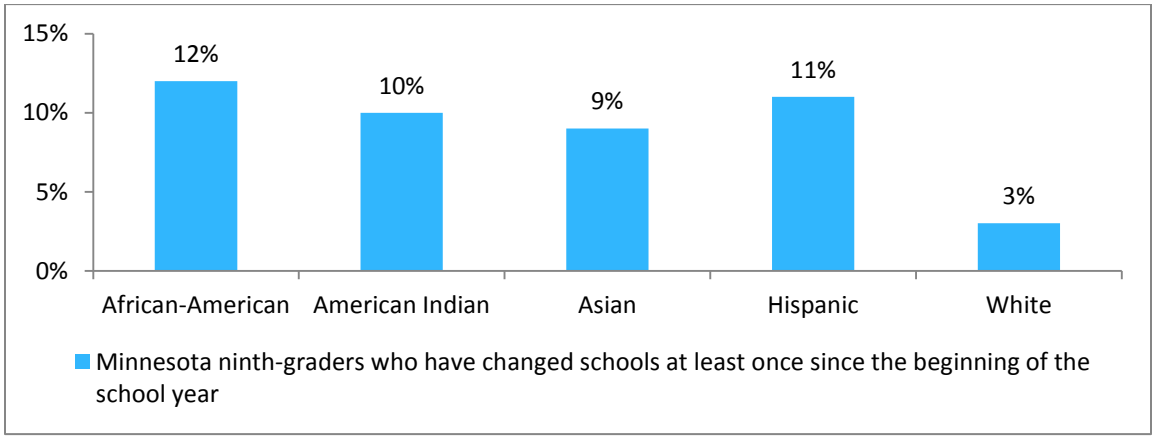
The proportion of Minnesota children living in families with single parents has been slowly growing over the past decade.

Source: U.S. Census Bureau. (2011).[62]

School Mobility

When families move their primary residence, children may change schools. Frequent moving during the school year can disrupt the flow of learning, weaken parent-student-teacher bonds, and make it more difficult for the child to form attachments at school. The residential mobility reflected in school moves also has implications for social connectedness within the neighborhood, for both children and parents.

Minnesota ninth-graders and changing schools: 2010



Changing schools mid-year is more common among students of color in Minnesota.

Source: Minnesota Student Survey. (2011).[63]

Among ninth-graders, Asian, Hispanic, American Indian and African-American students were three to four times more likely than white students to have changed schools at least once during the school year.

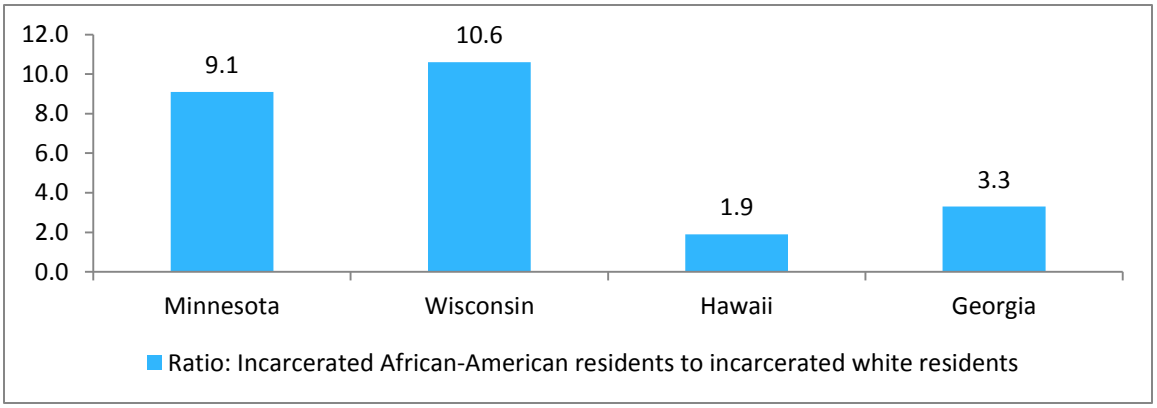
Incarceration

For many obvious reasons (and some less obvious), incarceration poses a number of individual and community health concerns. Incarcerated individuals are exposed to violence and infectious

diseases in close quarters, including tuberculosis. For those outside, incarceration weakens family ties, and increases community instability as members enter and are discharged—often repeatedly—from prison. This is especially true when a community has a disproportionally high number of individuals who are incarcerated.[64] Incarceration also changes individual and population patterns of employment, income, and marital status, all of which ultimately have an impact on health status.[65]

Incarceration disparities in Minnesota and comparison states: 2007

About nine African-American Minnesotans are incarcerated for every white Minnesotan incarcerated.



Source: The Sentencing Project. (2007). [66]

The rate of incarceration in Minnesota is relatively low compared with other states, for example Louisiana or Wisconsin. However, Minnesota (along with Wisconsin) has one of the highest relative disparities of incarceration rates among its African-American and white populations; Minnesota currently ranks 14th among U.S. states in this disparity, with a ratio of 9.1 African-American residents incarcerated for every single white resident. That is, for every white Minnesotan in prison, roughly nine African-American Minnesotans are also incarcerated.[67]

Community and Personal Safety

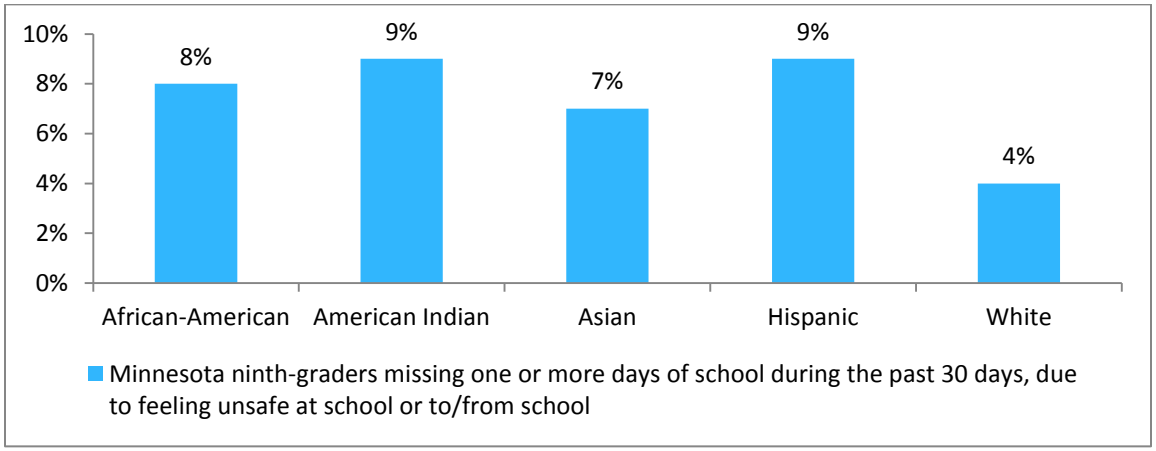
The same factors that influence where people live and the opportunity they have to be healthy—income, employment, education—also are linked to the experience of violence. Violence is not randomly distributed; some groups of Minnesotans are more likely to be affected by violence than others.

Violence and crime affect health in multiple ways. High-crime neighborhoods keep people isolated from one another by keeping them indoors, limiting opportunities both for interaction with neighbors and for physical activity.[68] Individuals who experience crime, as well as those who witness or hear about it, experience a range of effects from a delay in cognitive development (for children) to poor mental health.

Violence in schools can affect the learning environment and contribute to absenteeism. In Minnesota, between 4 and 10 percent of students missed one or more days of school because they felt unsafe at school, or on their way to or from school.

Students of color and American Indian students were more likely to report feeling unsafe than white students. In addition, witnessing or participating in violence makes youth less likely to engage in healthy behaviors like walking to school or participating in school athletics.

Minnesota ninth-graders missing school, due to feeling unsafe: 2010

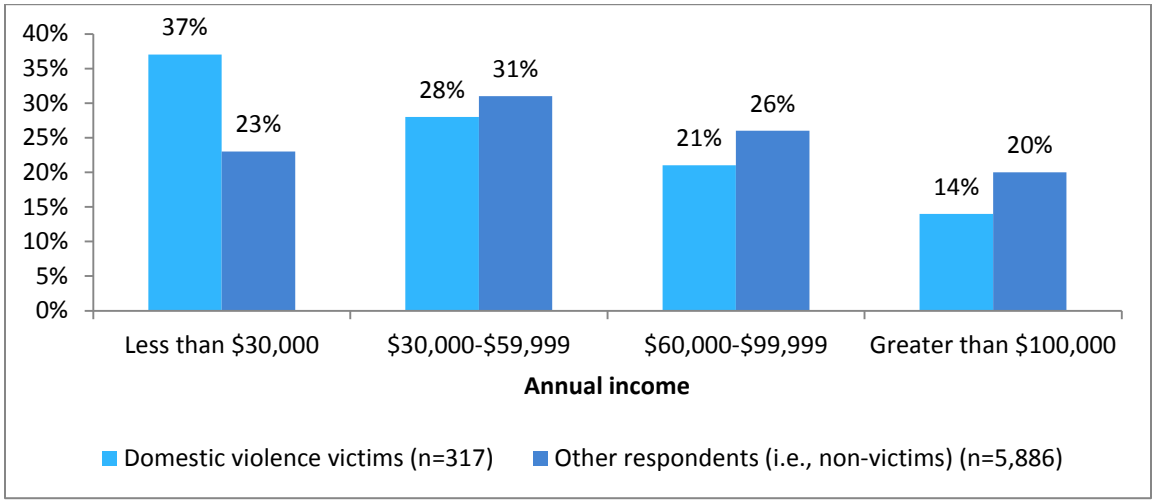


White students report feeling safer than other students while at school and on their way to/from school.

Source: Minnesota Student Survey. (2011).[69]

Domestic violence also occurs proportionately depending on income and education, for perpetrators, victims, and bystanders. Victims of domestic violence in Minnesota were less likely to have a college or graduate degree and more likely to have an associate or technical degree. Victims of domestic violence were also more likely to earn less than $30,000 annually and to rent a home or apartment, rather than own a home.[70]

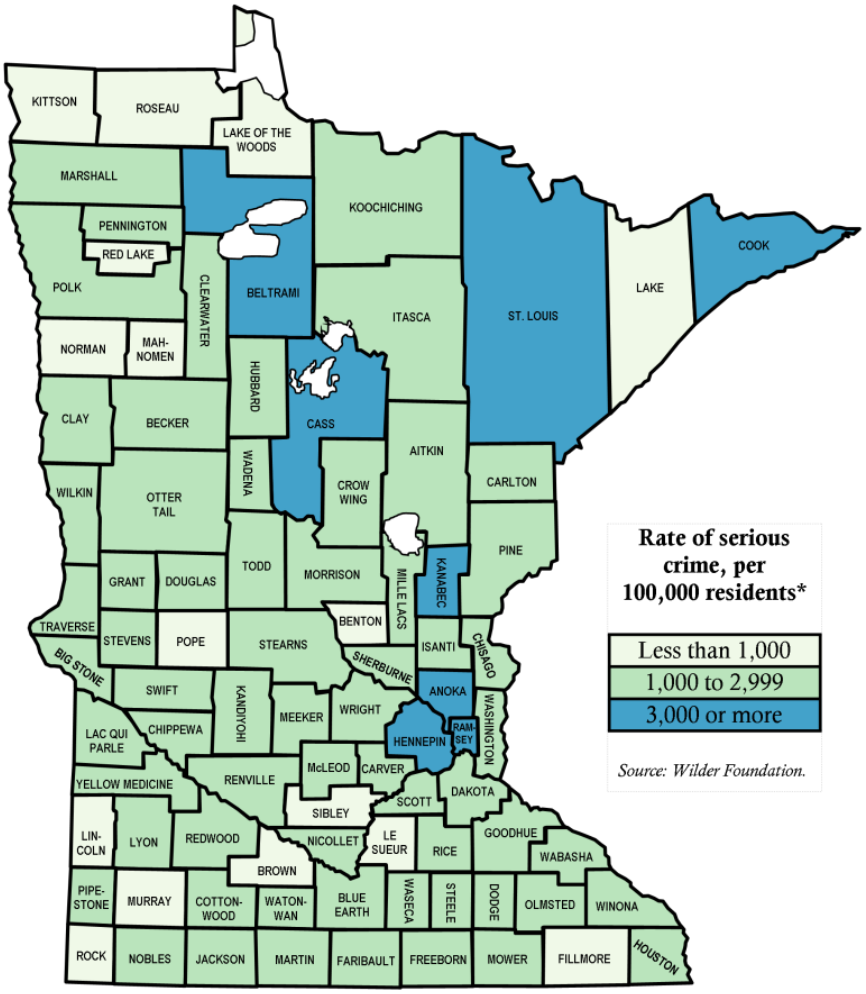
Minnesota domestic violence victims: 2010



While domestic violence occurs at every income level, lower-income Minnesotans are more likely to become victims of domestic violence.

Source: Greater Twin Cities United Way & Minnesota Department of Public Safety, Office of Justice Programs. (2011).[71]

Crime in Minnesota: 2010



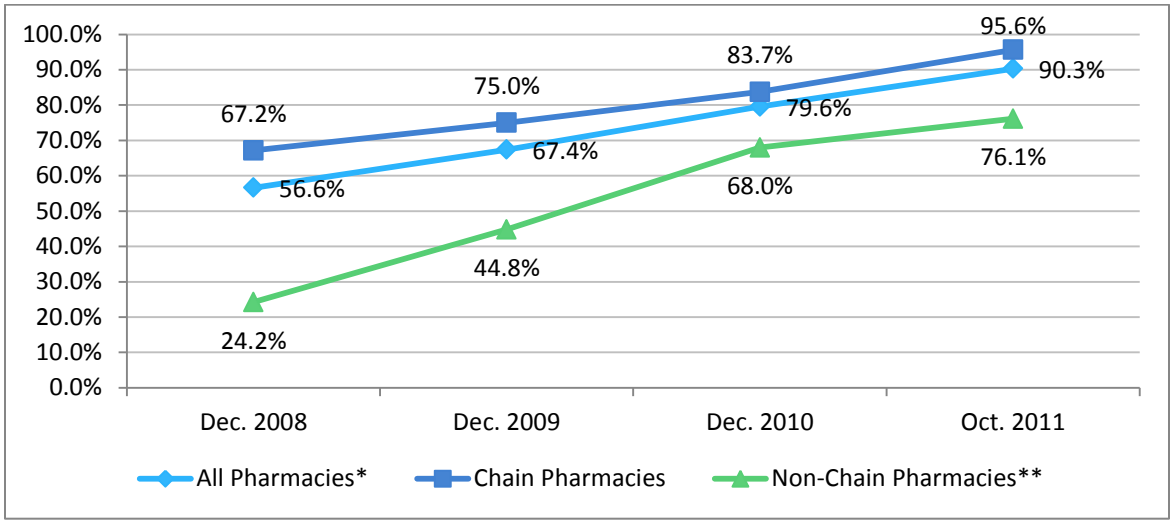
Access to Health Care

A number of the factors that shape the opportunity for health in Minnesota—education, employment, and transportation, for instance—also affect access to health care. In addition the health care workforce and the ability to acquire health care insurance also have an effect on the ability to receive health care.

Electronic Prescribing

Health care quality is affected by the ability of health systems to continually improve, to meet the needs of consumers and reduce medical errors. Electronic prescribing (or e-prescribing) is a new tool that allows providers, pharmacists and pharmacies, and insurers to securely and accurately exchange information. This lessens the likelihood of medication errors like assigning the wrong drug, dose, patient, time, rate, preparation, or route of administration, which all have serious consequences for patients and consumers.

Pharmacies and e-prescribing in Minnesota: 2008-2011



** Excludes pharmacies with the pharmacy class of medical device manufacturer*
*** Includes pharmacies with the pharmacy class of independent, franchise, and government/federal*
Source: U.S. Department of Health and Human Services, Office of the National Coordinator. (2011).[72]

E-prescribing in Minnesota's health care system has grown dramatically. In 2011, the number of e-prescription transactions saw a 40 percent jump. The number of Minnesota pharmacies using e-prescriptions has increased 58 percent since 2008, and most chain and non-chain pharmacies were e-prescribing by the end of 2011.

Health Care Workforce

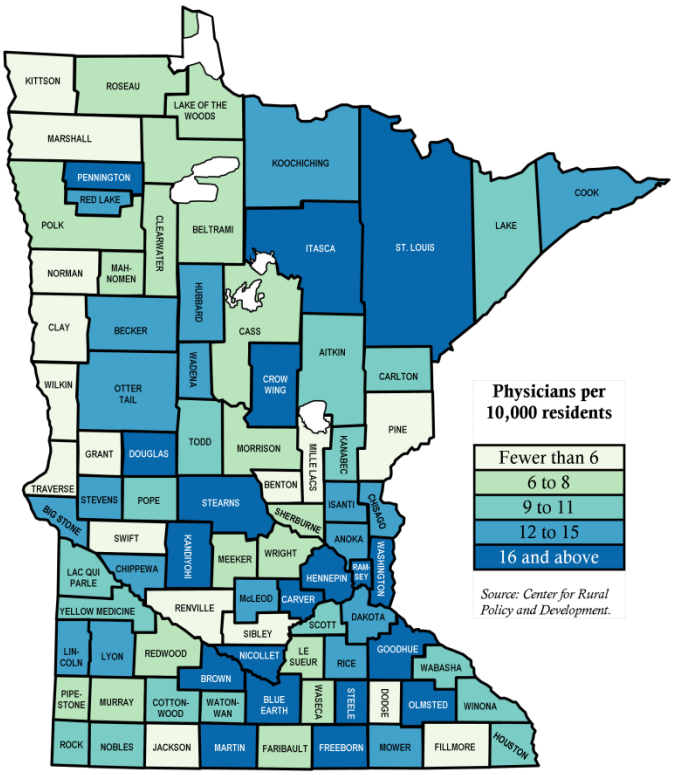
The health care workforce in Minnesota that carries out most routine and preventive care primarily consists of nurse practitioners, primary care physicians, and dentists. Regionally, some Minnesotans have greater or lesser access to primary care—for example, southeast Minnesota (where the Mayo Health System largely resides) employs a relatively high proportion of providers for its population when compared with the rest of the state,[§] while northwest Minnesota has access to a relatively smaller pool of providers.

Over one-third of Minnesota's counties have fewer than eight physicians per 10,000 residents, especially in the most rural areas of the state. Over 25 counties in Minnesota have fewer than four dentists per 10,000 residents.

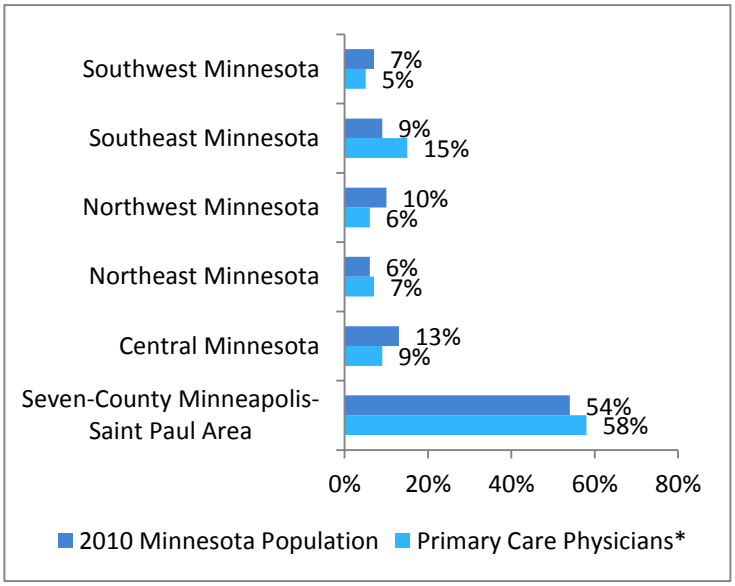
These regional differences in primary care provider saturation may reflect Minnesota's growing urbanization, or that many providers are choosing to practice in regions with a greater patient supply. However, health care workforce shortages can increase the distance traveled by Minnesotans seeking primary care, and ultimately reduce access for a number of rural residents.

[§] *It should be noted that Mayo providers deliver a large proportion of the system's care to non-Minnesotans.*

Physicians in Minnesota: 2011

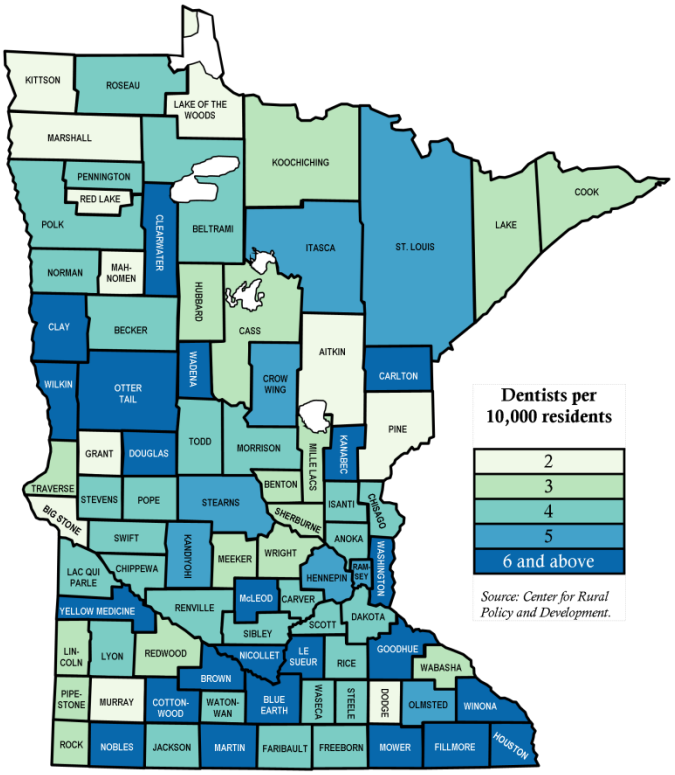


Geographic distribution of Minnesota's primary care physicians: 2009-2010

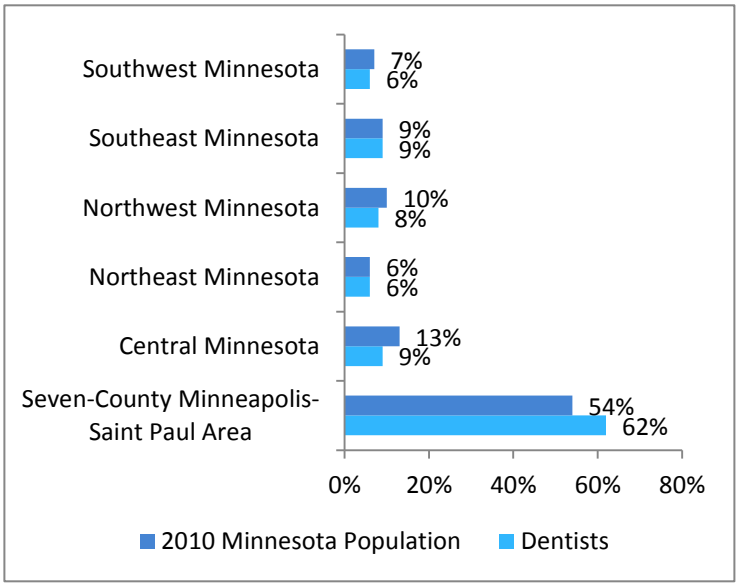


** Includes physicians with a single certification in family medicine, internal medicine, obstetrics and gynecology, or pediatrics. Source: Minnesota Board of Medical Practice. (2011).* [73]

Dentists in Minnesota: 2011



Geographic distribution of Minnesota's dentists: 2010



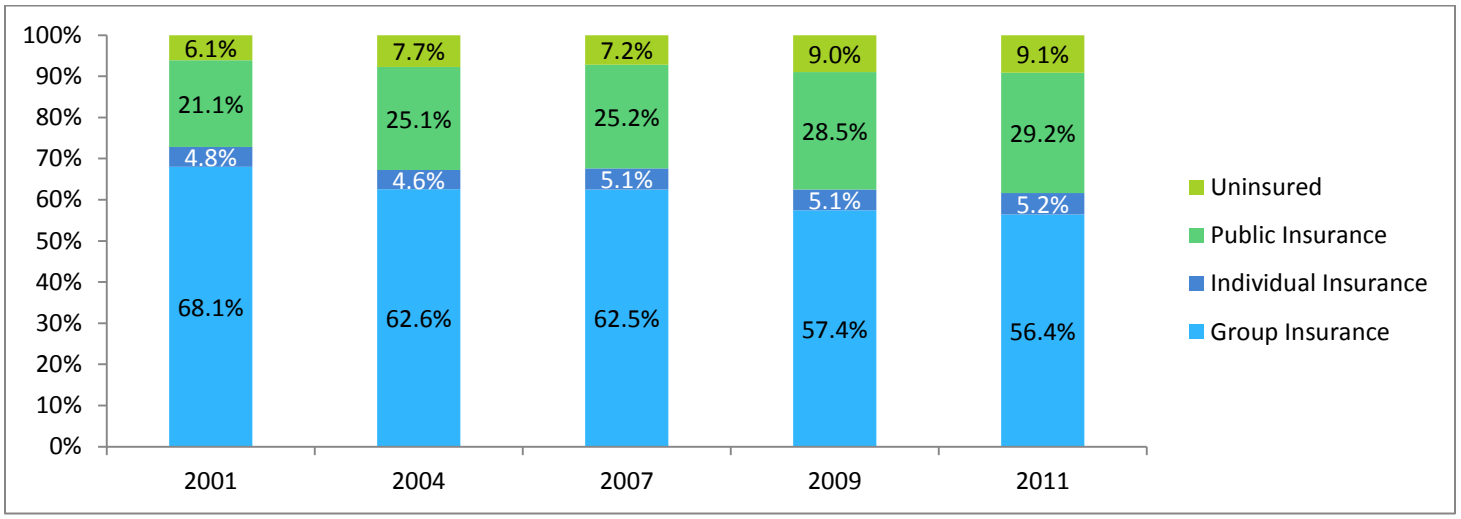
Source: Minnesota Board of Dentistry. (2011). [74]

Insurance Coverage

People who are uninsured or underinsured (that is, their insurance does not cover all necessary procedures) receive less medical care than their insured counterparts. When they do receive care, it has often been significantly delayed (often due to concerns about cost), and their condition and final outcome is frequently worse than if they had received care right away. In this way, the lack of health insurance creates a financial risk and a burden when care is received. Hospital-based charity care helps uninsured and underinsured Minnesotans, but does not compensate for gaps in health insurance coverage.

Health care coverage is provided through a system of multiple health insurers. More than half of Minnesotans get their health insurance coverage from an employer. About one-third are covered by public programs, including Medical Assistance (the state's Medicaid program), MinnesotaCare, and Medicare. Between 2009 and 2011, the group (employer) insurance coverage rate stayed stable, but it also has not recovered from the decline observed between 2007 and 2009, when the percent of Minnesotans with employer-based coverage fell from over 62 percent to just over 57 percent, with jumps in both public coverage and the rates of uninsured Minnesotans. [75]

Health insurance sources in Minnesota: 2001-2011



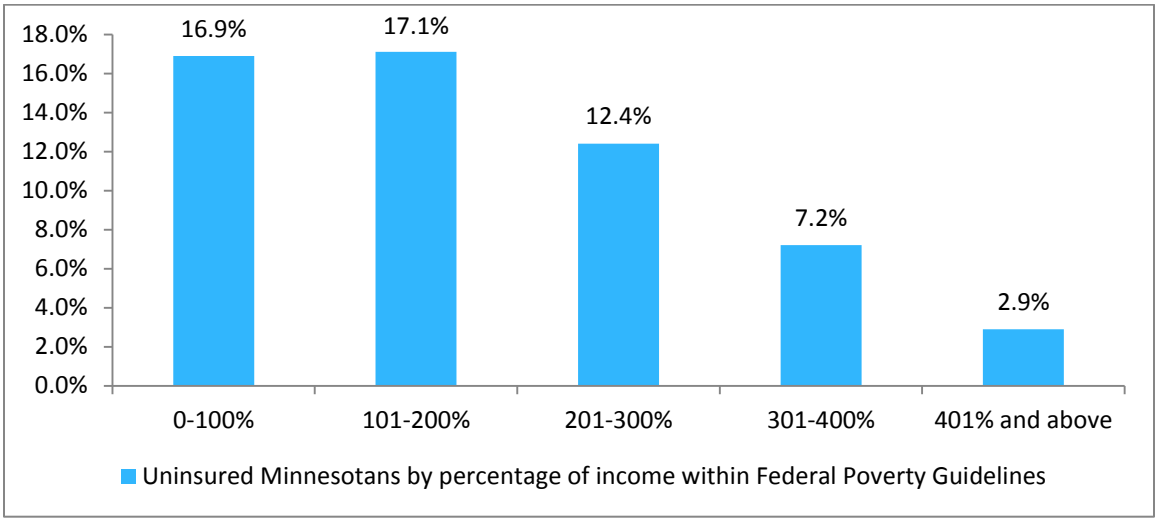
Indicates statistically significant difference from the previous year shown.
Source: Minnesota Department of Health, Health Economics Program. (2012).[76]

Significant differences in the rate of insurance persist both by income and by race/ethnicity:

- In 2009, 17 percent of families with incomes under 200 percent of the Federal Poverty Guidelines were uninsured, compared to 3 percent of families with incomes at or over 400 percent of the Federal Poverty Guidelines
- In 2009, 25 percent of the Hispanic/Latino population, 21 percent of American Indians, and nearly 18 percent of African-American Minnesotans were uninsured, compared to 11 percent of Asians and less than 8 percent of the white population.

Uninsured Minnesotans, by income level: 2009

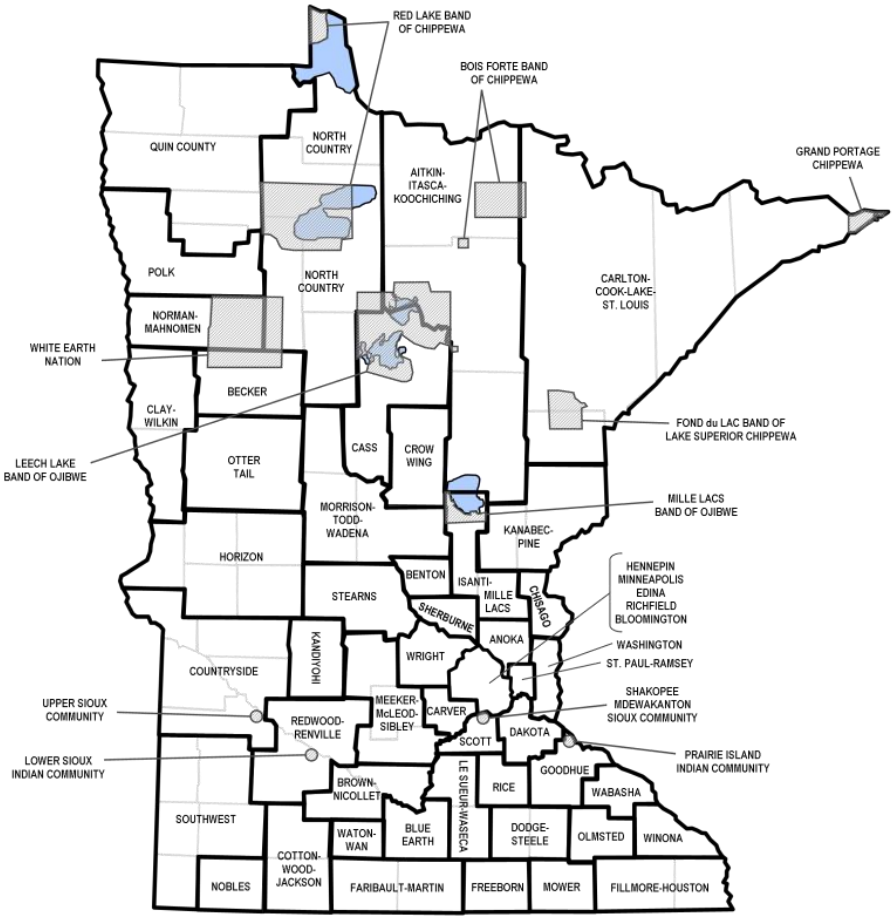
Lower-income families in Minnesota are less likely to have health insurance coverage.



Source: Minnesota Department of Health, Health Economics Program. (2010).[77]

Public Health Infrastructure

Minnesota community health boards and tribal nations: 2012



Public health departments across Minnesota work together with and within their communities to protect and improve health. Local public health departments and community health boards provide essential public health services for communities of all sizes, including monitoring population health, informing and educating people about health issues, mobilizing community partnerships to address local health problems, developing policies and plans, enforcing regulations, and assuring that people get health care.

Within the last decade, state, local, and tribal health departments have started the process of establishing consistent standards for public health, in order to ensure their capability to effectively carry out their mission. In 2011, the Public Health Accreditation Board released national voluntary public health accreditation standards for state, local, and tribal health departments.

Those departments can begin applying for accreditation in 2012, and a survey of Minnesota's local and tribal health departments reveals that over three-fourths are taking steps to prepare for accreditation. The state's health department, the Minnesota Department of Health, is also preparing to apply for national voluntary public health accreditation.

Public Health Funding

Minnesota ranks 46th among states in the U.S. in state and federal funding for public health.

Funding for public health care can assure access to disease prevention, health screening, surveillance, health promotion, and other population-based services. For this reason, it is an important consideration for a community's opportunity for health. Among U.S. states, Minnesota ranks 46th in combined state and federal funding per capita for public health services, at $44.93 per resident.[78]

Emergency Preparedness

Minnesota households can prepare for emergencies like floods, widespread disease outbreaks, or terrorist incidents.

Minnesotans and emergency preparedness: 2007

	Yes	Partially	No
Have heard, seen, or read about how to prepare household for an emergency	45%	-----	55%
Have stored enough food, water, and supplies to meet household needs for at least three days	56%	4%	40%

	Almost Always	Sometimes	Rarely	Never
Stay home from work, school, or other activities when ill with a respiratory illness like cold or flu	18%	25%	37%	21%

Source: Minnesota Department of Health. (2007). [79]

All-hazard mitigation plans are an important part of a county's arsenal in preparing for emergencies. In 2008, 36 percent of Minnesota counties had adopted all-hazard mitigation plans; by February 2011, 92 percent of counties had adopted or approved plans.[80]

Healthy Living in Minnesota

Minnesota individuals, families, and communities live healthy lives by protecting and promoting their own health, as well as each other's health. Making healthy choices at the individual and community level requires knowledge and understanding, as well as the freedom to act on those decisions. As a result, healthy living is highly dependent on the contextual factors described in "The Opportunity for Health."

The issues described in this section include not only what are typically considered healthy behaviors for an individual (such as engaging in physical activity, having healthy eating habits, and appropriate use of alcohol, tobacco and prescription drugs), but also ways in which people protect and promote health for others: assuring a healthy start for children; preventing and managing chronic conditions; preventing disease and injury; and promoting mental health.

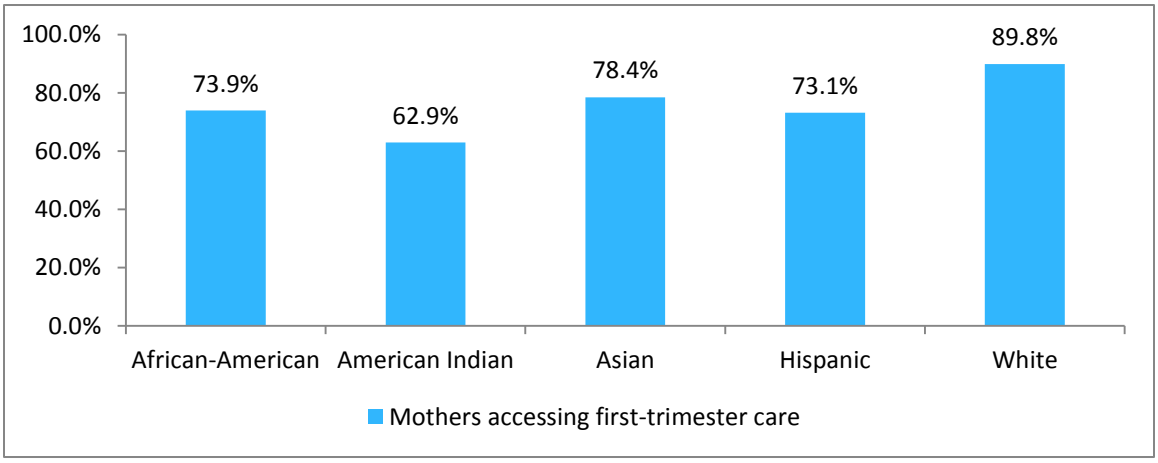
A Healthy Start for Children

Prenatal Care and Healthy Pregnancies

Women who access prenatal care receive some of the most important components of care to assure a healthy pregnancy, and prevent prematurity or low birth weight, both of which are significant contributors to infant mortality and high costs of care. Prenatal care encompasses a multitude of measures, including discussing a mother's healthy choices and body changes; prenatal testing and counseling; treating medical complications like gestational hypertension, diabetes, and anemia; promoting optimal weight gain; testing for sexually transmitted infections; oral health assessment and treatment; and maternal mental health and substance abuse screening.

Prenatal care in Minnesota: 2006-2010

White mothers have the highest rate of first-trimester prenatal care in Minnesota.



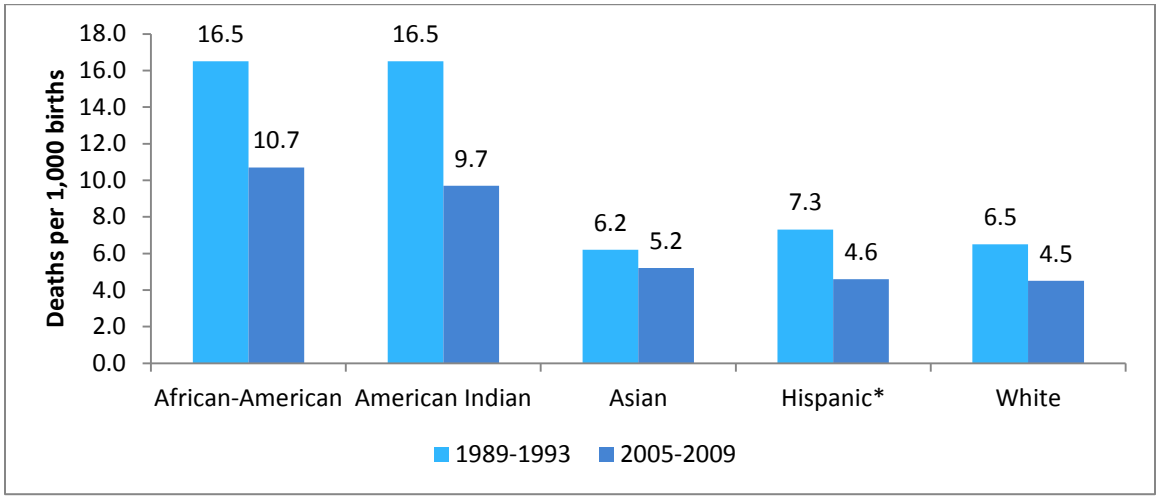
Source: Minnesota Department of Health, Center for Health Statistics. (2011).[81]

Lower rates of prenatal care in some Minnesota populations can be correlated with disparities in infant mortality rates among those same populations. The death of an infant has a profound impact on families and communities, and is an important indicator of population health.

Minnesota consistently ranks among the states with the lowest infant mortality rates. In fact, infant mortality rates have declined for all racial and ethnic populations in Minnesota over the last 20 years. Nonetheless, significant disparities persist in the mortality rates of African-American and American Indians infants, compared to all other population groups.

The causes of infant mortality vary by population: sleep-related causes, such as SIDS (sudden infant death syndrome), are a primary source of infant deaths in the American Indian community, while prematurity is the leading cause of death among African-Americans. Birth defects are the main source of infant deaths in the Asian, Hispanic, and white populations. Chronic stress, poverty, substance abuse, a lack of prenatal care, and lack of access to health care all contribute to infant mortality.

Infant deaths in Minnesota, for children born in 1989-1993 and 2005-2009



The rate of infant death among African-American and American Indian infants is nearly double the rate in other population groups.

** Can be any race*
Source: Minnesota Department of Health, Minnesota Center for Health Statistics. (2011).[82]

Smoking and Alcohol Use during Pregnancy

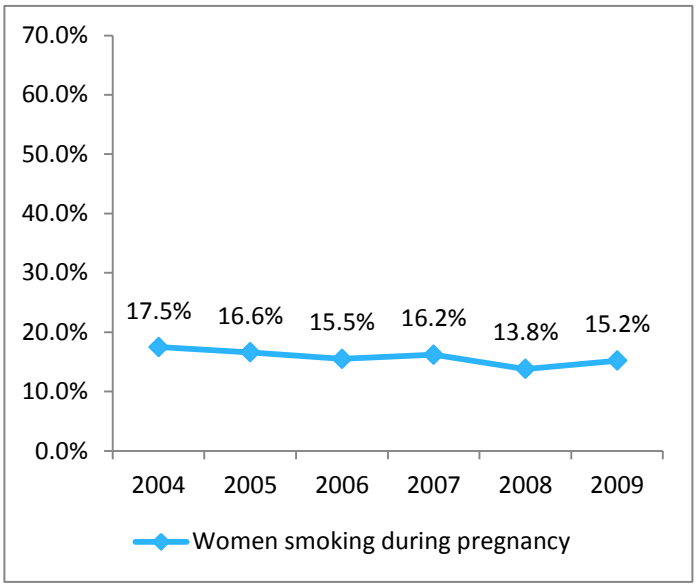
Smoking during pregnancy is the single most preventable cause of maternal and infant illness and death. Smoking during pregnancy increases the risk of stillbirth, low birth weight, sudden infant death syndrome (SIDS), preterm birth, cognitive and behavioral problems, and respiratory problems in both mother and child. Children exposed to tobacco in utero are more than twice as likely to become regular smokers themselves later in life, compared with children not exposed to tobacco in utero. However, women who quit smoking before pregnancy or early in pregnancy significantly reduce their risk for these results, and also avoid delays in conception (and infertility), premature membrane rupture, placental abruption, and placenta previa.[83]

The rate of women in Minnesota who smoke during pregnancy has remained relatively stable between 15 and 17 percent. Rates of smoking during pregnancy are significantly higher in some populations, however, such as among American Indian women, younger women (under 25), women with a high school education or less, and women who are poor or unmarried.

There is no known safe amount of alcohol to drink while pregnant, and no known safe time to drink alcohol during pregnancy. Drinking alcohol during pregnancy can cause miscarriage, stillbirth, and a range of lifelong disorders, known as fetal alcohol spectrum disorders (FASDs).

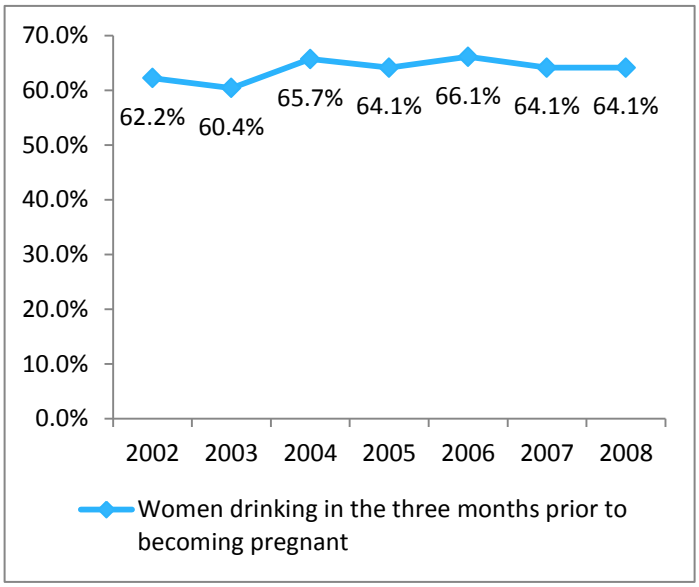
Children with FASDs can have a host of problems, including poor coordination, hyperactive behavior, difficulty paying attention, poor memory, difficulty in school, learning disabilities, speech and language delays, poor reasoning and judgment skills, vision or hearing problems, and problems with the heart, kidney, or bones.

Smoking during pregnancy in Minnesota: 2004-2009



Linear trend p<0.05
Source: Minnesota Department of Health, Minnesota Pregnancy Risk Assessment Monitoring System (PRAMS). (2011).[84]

Drinking prior to pregnancy in Minnesota: 2002-2008



Denotes mothers reporting having any alcoholic drinks during the three months before getting pregnant
Source: Minnesota Dept. of Health, Minn. Pregnancy Risk Assessment Monitoring System (PRAMS). (2011).[85]

Rates of alcohol use vary widely by race, income, and education. In 2008, white mothers, mothers with more than a high school education, and mothers with more than $50,000 annual income were two and three times more likely to have had alcoholic drinks during the three months before pregnancy than Hispanic mothers, mothers with less than 12 years of education, and mothers with less than $10,000 annual income.

Drinking prior to pregnancy in Minnesota: 2008

Population	Percent who drink in the three months prior to pregnancy
White	74.2%
Hispanic	22.0%
Greater than 12 years of education	73.3%
Less than 12 years of education	27.3%
Annual income of $50,000 or more	77.6%
Annual income of less than $10,000	35.5%

Source: Minnesota Dept. of Health, Minnesota Pregnancy Risk Assessment Monitoring System (PRAMS). (2011).[86]

Smoking rate disparities among pregnant women in Minnesota: 2007-2009*

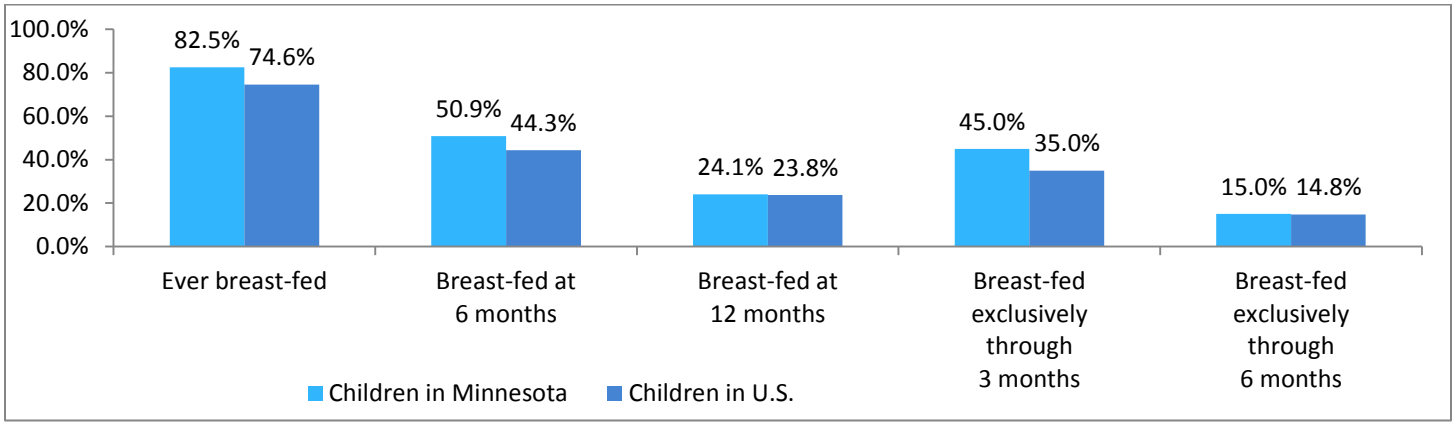
Population	Percent who smoke while pregnant
American Indian	45.2%
African-American	25.3%
Less than 20 years old	23.5%
Between 20 and 24 years old	27.7%
Unmarried	30.4%
High school education or less	26.7%
At 0-100% FPL*	27.6%
At 101-185% FPL*	21.8%
Receiving Medical Assistance (Medicaid)	30.1%
Uninsured	23.8%

** FPL: Federal Poverty Guidelines. Data reflects combined years: 2007-2009*
Source: Minnesota Dept. of Health, Minn. Pregnancy Risk Assessment Monitoring System (PRAMS). (2011).[87]

Breast-feeding

Breast-feeding conveys important protective factors for infants, such as boosting immune system response and preventing obesity. Breastfeeding also promotes maternal-child bonding. The American Academy of Pediatrics recommends breast-feeding for a year or more after birth. Minnesota mothers breast-feed at a higher rate than those in the United States overall.[88]

Breast-feeding in Minnesota and the U.S., for children born in 2008



Source: Centers for Disease Control and Prevention. (2011).[89]

Childhood and Youth Experience

It is impossible to overestimate the importance of childhood** health on the rest of an individual's life. The importance of childhood experience for health cannot be overestimated. Positive experiences in childhood (such as breastfeeding, for example) have important implications for

** *For the purpose of this assessment, "child" refers to individuals between 0 and 18 years old.*

lifelong health, as do negative experiences. The number of adverse childhood experiences an individual has increases his or her risk for alcoholism, depression, heart disease, liver disease, intimate partner violence, sexually transmitted infection, smoking, and suicide. These adverse events include emotional, physical, and sexual abuse and neglect, and various types of household dysfunctions (such as violence against mothers, substance abuse, mental illness, parental separation or divorce, or an incarcerated household member).[90]

Violence Against Children and Teens

Child Abuse

In 2009, nearly 5,000 Minnesota children were abused or neglected; 44 children suffered life-threatening injuries, and 21 died from maltreatment. The median age of abuse victims was six years old. Three-fourths of all alleged abusers are the victims' birth parents. Some children were victims of more than one offender, and some suffered more than one form of abuse and neglect.

Children who have been physically or sexually abused are much more likely to engage in destructive behavior, such as substance use, fighting, and early sexual activity in adolescence. Research also links abuse during childhood to health risks that may emerge later, such as obesity, chronic pain and heart disease.[91]

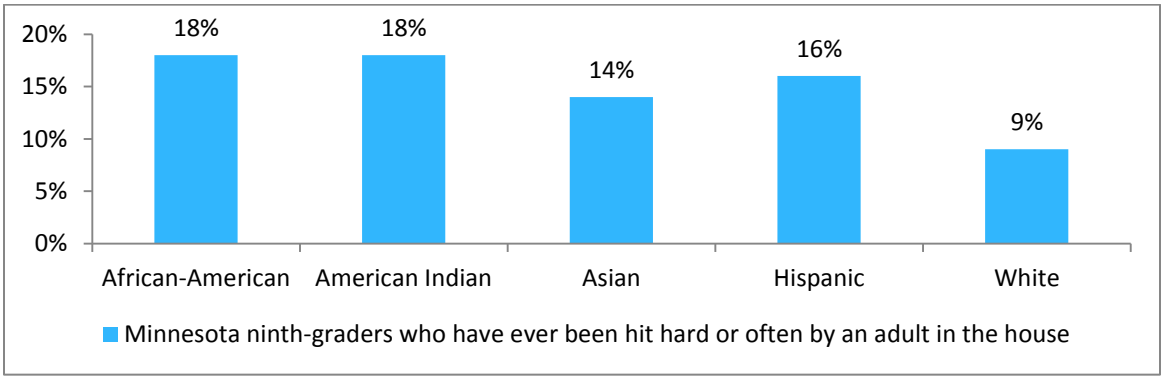
Reported abusers and their relationship to abused children in Minnesota: 2009

Relationship to Child	Percent of Abusers
Birth parent	75%
Other relative	12%
Parents' companion	7%
Licensed provider	2%
Other non-relative	3%

Source: Minnesota Department of Human Services. (2010).[92]

Minnesota ninth-graders and physical abuse* in the home: 2010

Ninth-graders in the state's populations of color are more likely to report having been hit by an adult at home than the state's white ninth-graders.



Source: Minnesota Student Survey. (2011).[93]

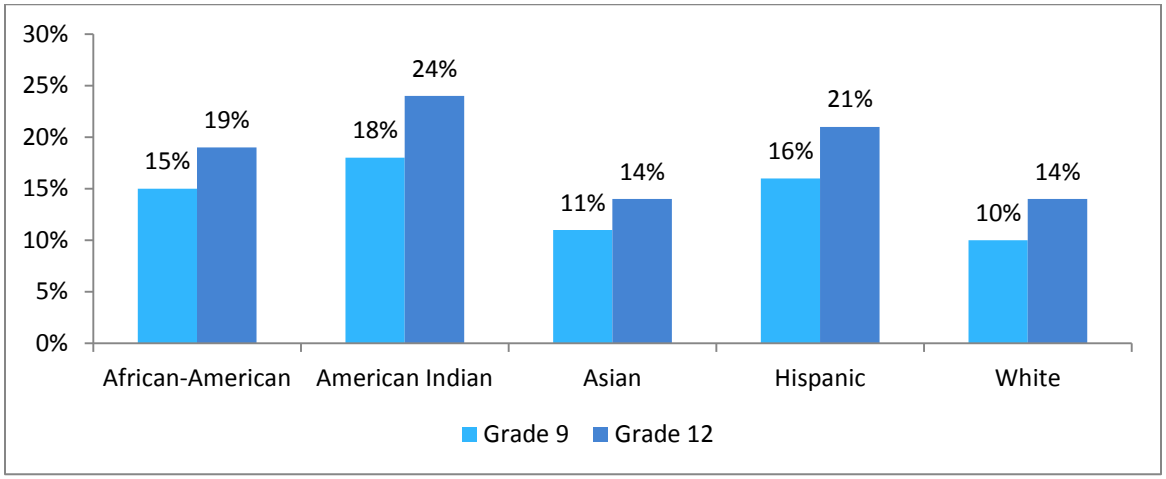
In the Minnesota Student Survey, students from each of the communities of color and American Indians were more likely than white students to report that they had been hit hard or often by an adult in the household.

Sexual and Relationship Violence

Ten percent of ninth-graders and 15 percent of 12th-graders in Minnesota report experiencing some form of date violence. The highest rates were reported by American Indian and Hispanic students. Nearly one-fourth of American Indian 12th-graders reported physical or sexual violence by someone they were dating.

Minnesota students and intimate partner violence: 2010

Minnesota ninth- and twelfth-graders who have ever been hit, hurt or threatened, or forced to do something sexual by someone they were dating



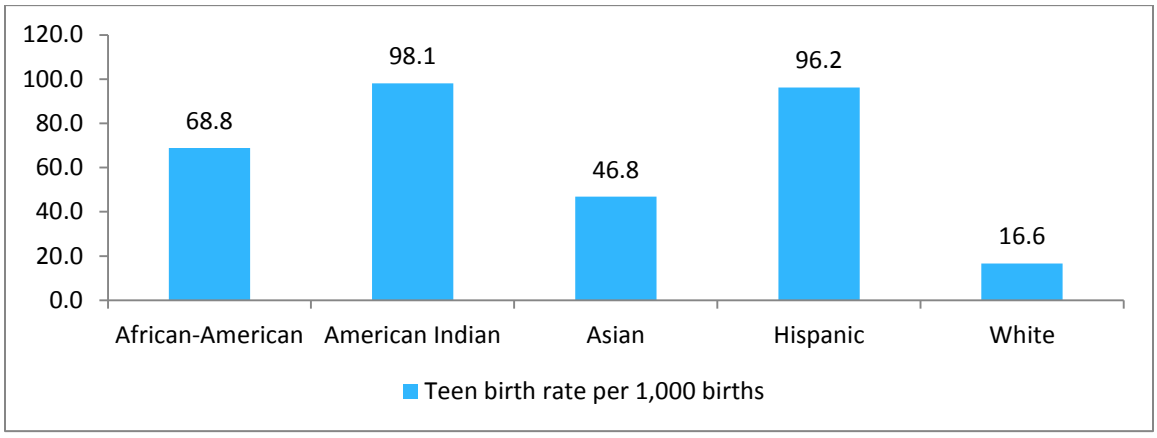
Nearly one-fourth of the state's American Indian 12th-graders report having experienced violence at the hands of someone they were dating.

Source: Minnesota Student Survey. (2011).[94]

Teen Parenting

Minnesota teens give birth at lower rates than those in other states, and Minnesota's teen birth rate has continued to decline in the last two decades. However, there are still striking differences in teen birth rates by racial and ethnic population: Asian, African-American, Hispanic and American Indian teen birth rates range from three to six times higher than that of white teens. [95]

Minnesota's teen birth rate for girls 15-19 years old: 2006-2010



The teen birth rate in Minnesota remains highest among American Indian and Hispanic teens.

Source: Minnesota Department of Health, Center for Health Statistics. (2011).[96]

Teen parents and their children face a number of unique challenges. Teen mothers are less likely to graduate from high school, and are more likely to remain unmarried, live in poverty, have large families, and receive government assistance than women who become parents after adolescence. Teen mothers are also less likely to receive timely and consistent prenatal care.[97]

Children of teen parents are more likely to be born at a low weight, perform poorly on cognitive and behavioral tests, be reported as abused or neglected, and be placed in foster care. They tend to perform more poorly in school than children of older parents. Daughters of teen parents have an increased risk of becoming teen parents themselves, and sons of teen parents are more likely to become incarcerated.[98]

Gender Identity and Sexual Orientation

Adolescence is a time of developing sexual awareness and gender expression, although many children are aware of their developing gender identity from a very early age. All adolescents face issues related to acceptance, self-esteem, and a growing need for intimacy and social connection. Lesbian, gay, bisexual, or transgender (LGBT) youth, however, often face discrimination, social stigma, violence, victimization, and a lack of understanding relating to their unique needs, and this can create significant barriers to health.

Estimating the statewide health needs and outcomes for LGBT youth and adults in Minnesota can be difficult, because state and national population-based surveys, including the Minnesota Student Survey, do not ask people to categorize their sexual orientation or gender identity. Local surveys and studies, however, such as the 2010 Hennepin County Survey of the Health of All the Population and the Environment (SHAPE)[99] and the Boynton Health Service survey of University of Minnesota Students[100] have identified important disparities in health needs, health care, and health outcomes for LGBT youth and adults.

The Environment and Children

Pound for pound, children breathe more air, drink more fluids, and eat more food than adults. Because children are continually growing and developing, they may be more vulnerable to environmental hazards than adults. This leads to concern about the effect of contaminants specifically on children, including allowable levels of water contaminants, mercury levels in fish intended for consumption, exposure to hazardous waste sites, air quality, lead exposure, and exposure to toxic chemicals found in meth labs.[101]

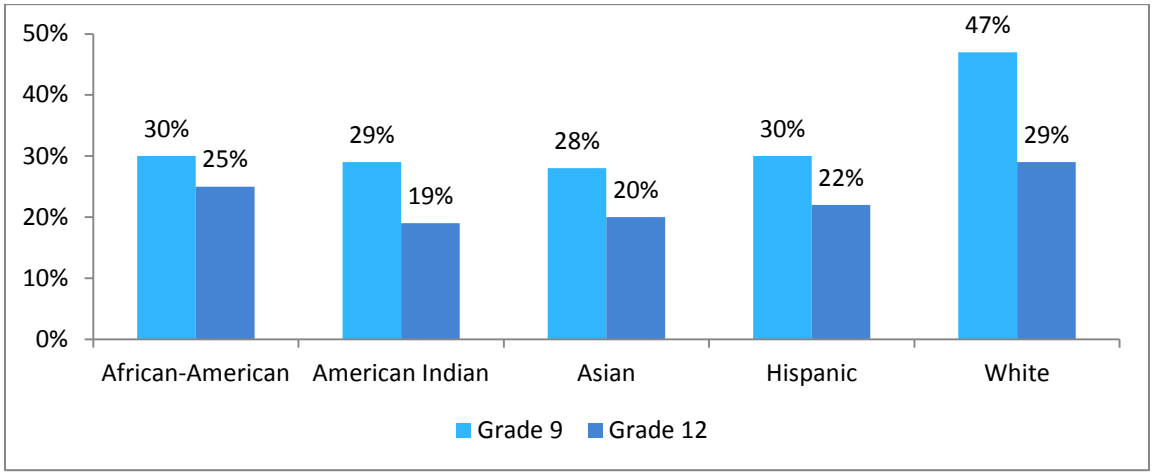
Youth-Community Involvement

Civic engagement and community involvement are important for individual, family, and community health. Research on adolescent brain development supports the need for youth to learn how to become part of a broader community, and to explore their unique contributions within that community. Positive experiences in the community provide youth with social learning experiences and help them develop a healthy social identity.

Religious participation is an indicator of community experience for Minnesota adolescents. White students in Minnesota report participating in religious activities more frequently than other racial and ethnic populations, especially among ninth-graders. Participation declines across all races and ethnic groups by 12th grade.

Minnesota ninth-graders and religious activities: 2010

Minnesota ninth- and twelfth-graders who participate in religious activities at least once per week



White ninth-graders in Minnesota report regular participation in religious activities more often than other students of color.

Source: Minnesota Student Survey. (2011).[102]

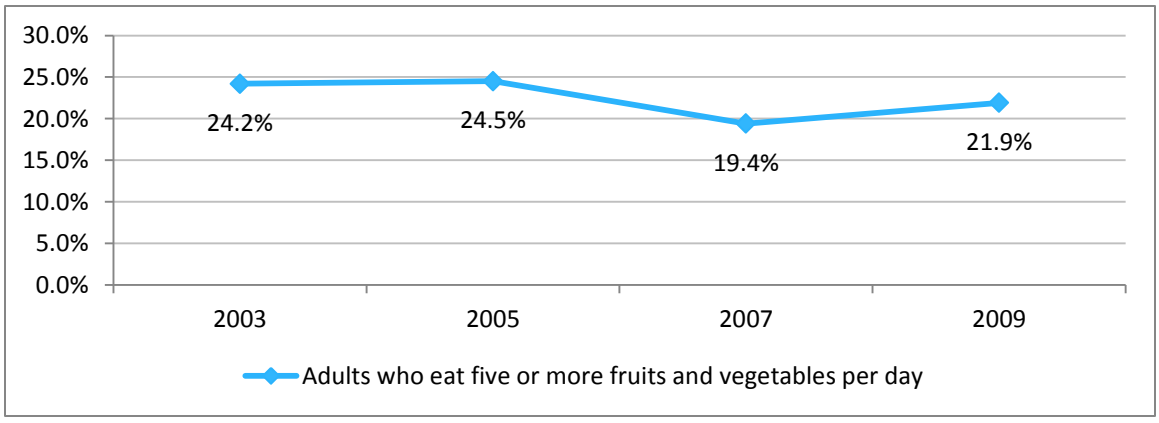
Eating Habits and Physical Activity

Eating Habits

Food has a direct effect on a person's health, growth, and feeling of well-being. Eating a balanced diet is essential: different nutrients play different roles, so it is important for people to eat a variety of foods, particularly fruits and vegetables. Despite this need, about three-fourths of Minnesotans do not eat the recommended amounts of fruits and vegetables.

Poor eating habits at every age, especially those that result in too many calories, too much saturated fat and sodium, and too few nutrients (e.g., sugary drinks and a lack of whole grains) increase the risk for disease and disability. The consequences of poor nutrition include obesity, diabetes, heart disease, stroke, tooth decay, and some cancers.

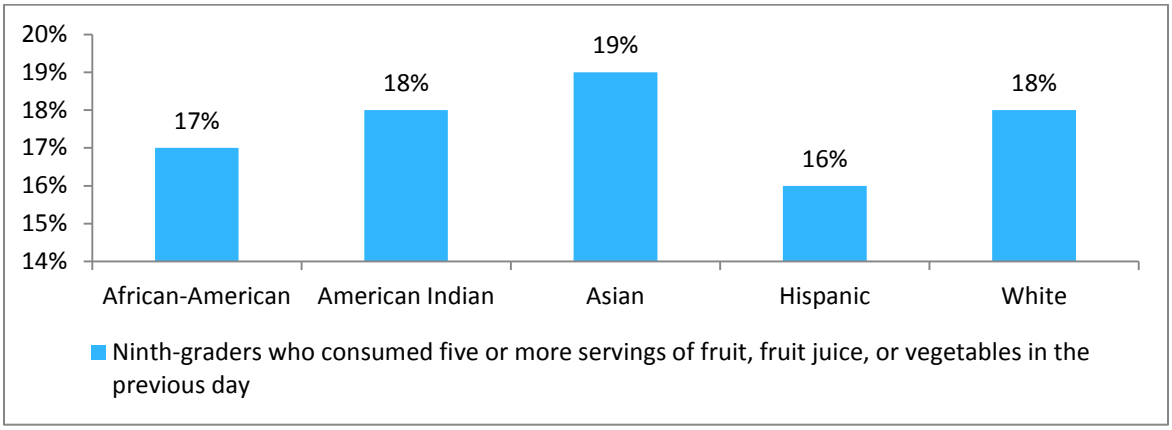
Minnesota adults and healthy eating: 2003-2009



Less than one-fourth of Minnesota adults and less than one-fifth of Minnesota ninth-graders eat the U.S.D.A. recommended daily amount of fruits and vegetables.

Source: Centers for Disease Control and Prevention. (2011).[103]

Minnesota ninth-graders and healthy eating: 2010



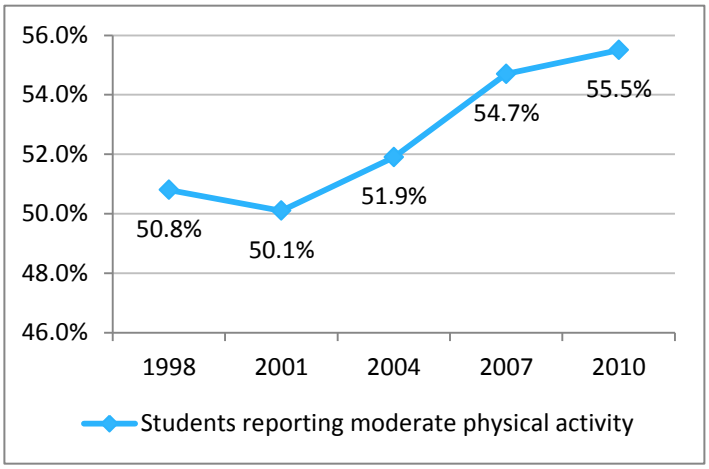
Source: Minnesota Student Survey. (2011).[104]

Physical Activity

Regular physical activity helps improve overall health and wellness, reduces risk for obesity, and lessens the likelihood of developing many chronic diseases like cancer and heart disease.[††]

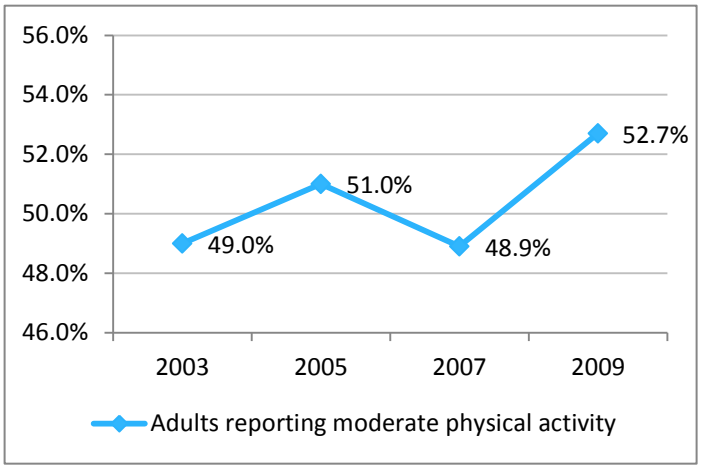
The national physical activity guidelines recommend that children engage in at least 60 minutes of physical activity each day, including aerobic, muscle strengthening, and bone strengthening activity. Adults need at least two hours of moderate to vigorous-level activity every week, and muscle-strengthening activities on two or more days a week.[105]

Minnesota students and physical activity: 1998-2010



Students who were physically active for 30 minutes or more at least five of the last seven days
Source: Minnesota Student Survey. (2011).[106]

Minnesota adults and physical activity: 2003-2009



Moderate physical activity defined as 30+ minutes of moderate physical activity (or 20+ minutes of vigorous physical activity) five or more days per week
Source: Centers for Disease Control and Prevention. (2011).[107]

*†† For more information on rates of heart disease, cancer, and other chronic diseases, please refer to **Part Two**.*

Physical activity among Minnesota ninth graders increased slightly between 1998 and 2010. Physical activity among Minnesota adults has remained relatively steady during the past decade.

Use of Alcohol, Tobacco, and Prescription Drugs

Alcohol can be consumed appropriately and responsibly, as can prescription medications. Problems occur when these substances are over-consumed, used inappropriately, or combined with other substances or with risky activities (like driving while impaired or engaging in unsafe sexual activity).

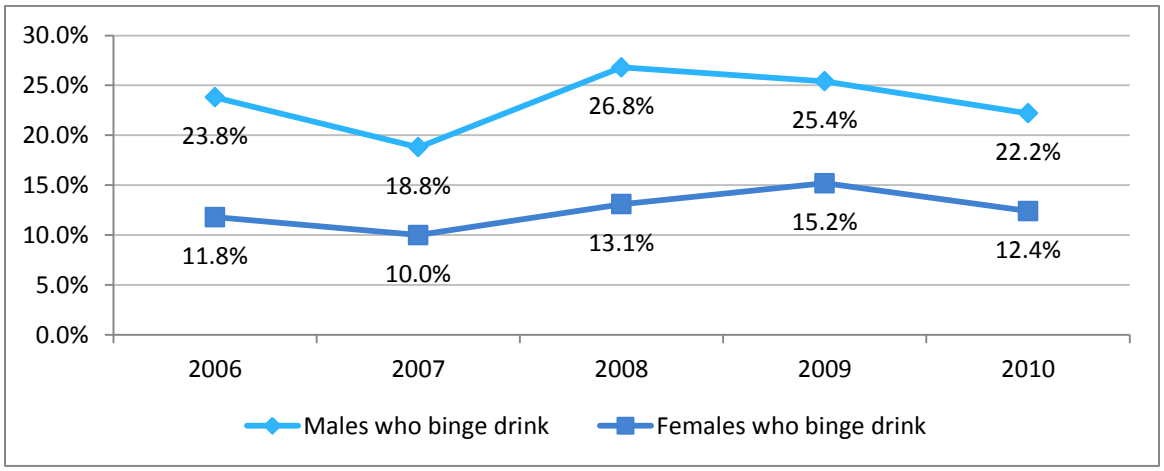
Smoking cigarettes and using other tobacco products can lead to nicotine addiction and multiple health risks, including cancer. The occasional use of tobacco, however, in the context of a cultural celebration (e.g., the use of a pipe in some American Indian ceremonies) does not necessarily carry these risks.

Alcohol Use and Binge Drinking

Alcohol is consumed by more people than any other drug, including tobacco. Alcohol use contributes to injury, unplanned pregnancy, poor birth outcomes and childhood development, violence, infectious disease, and chronic disease.

The younger a person begins drinking regularly, the greater the chance that person will develop a clinically defined alcohol disorder like alcoholism. Youth who start drinking before age 15, compared to those who start at 21, are far more likely to be injured while under the influence of alcohol, to be in a motor vehicle crash after drinking, or to become involved in a physical fight after drinking.[108]

Minnesota adults and binge drinking: 2006-2010



Approximately one-fourth of adult males in Minnesota reported binge drinking in 2010.

Source: Centers for Disease Control and Prevention. (2011).[109]

Binge drinking, in which a person consumes a great deal of alcohol in a short period of time, is associated with the same serious health problems as other forms of alcohol abuse. (Binge drinking can be defined as five or more drinks at one time for men, and four or more drinks at one time for women.)

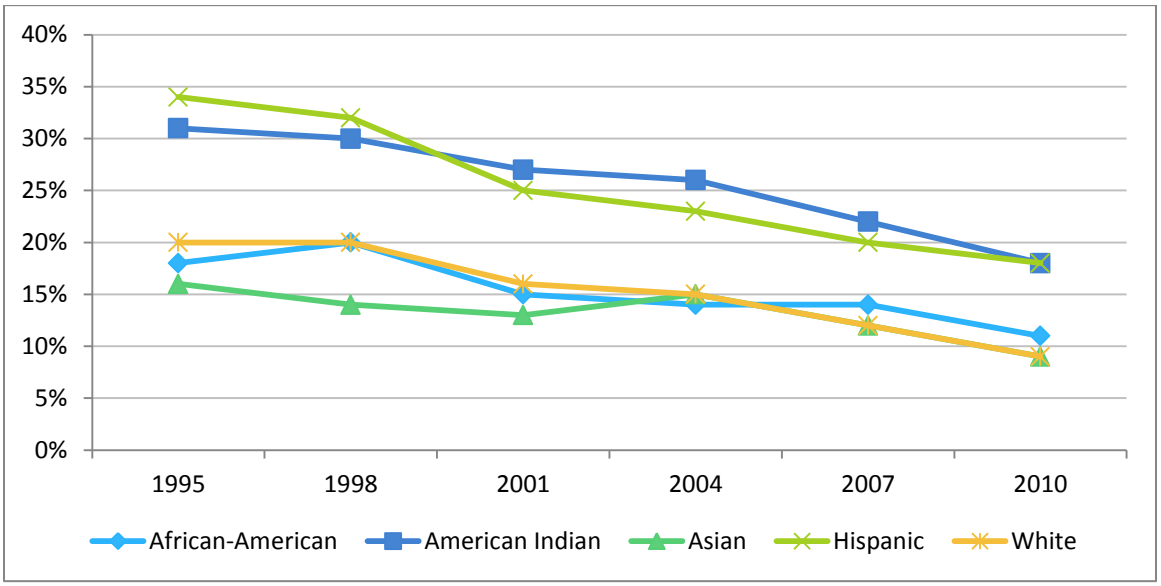
Binge drinkers are 14 times more likely to report engaging in alcohol-impaired driving than non-binge drinkers. About 90 percent of the alcohol consumed by those under 21 occurs via binge drinking. [110]

Binge drinking is a particular public health concern in Minnesota, and is a major reason for Minnesota's drop in the United Health Foundation's *America's Health Rankings*. [111] Minnesota's rate of binge drinking is higher than in most of the rest of the U.S., although it remains lower than the rates in the surrounding states of South Dakota, North Dakota, and Wisconsin. Binge drinking in Minnesota continues to be more prevalent in men than women.

Minnesota ninth-graders and binge drinking: 1995-2010

Minnesota ninth-graders who engaged in binge drinking during the last two weeks

Binge drinking rates in Minnesota have declined among teens in all population groups over the past 15 years.



	1995	1998	2001	2004	2007	2010
African-American	18%	20%	15%	14%	14%	11%
American Indian	31%	30%	27%	26%	22%	18%
Asian	16%	14%	13%	15%	12%	9%
Hispanic	34%	32%	25%	23%	20%	18%
White	20%	20%	16%	15%	12%	9%

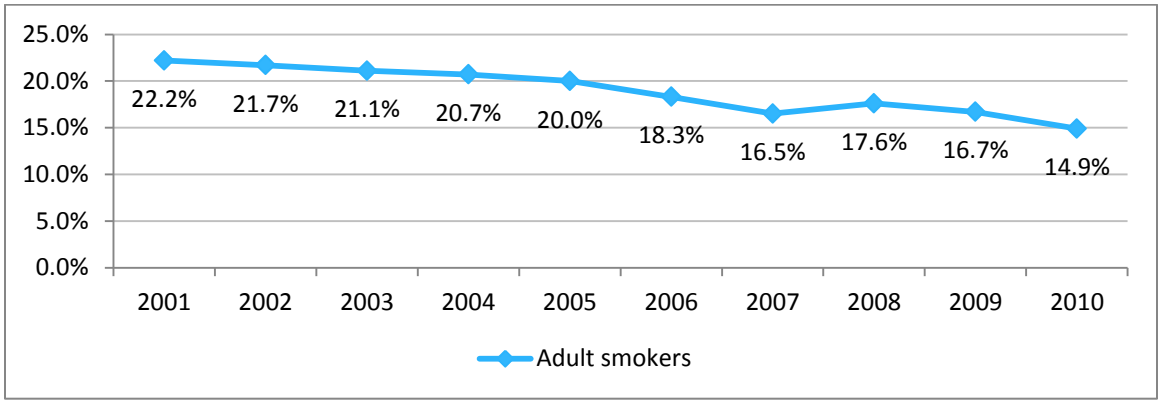
Source: Minnesota Student Survey. (2011).[112]

Minnesota's white and American Indian ninth-graders report the highest rates of binge drinking (defined as five or more alcoholic drinks in a row for both males and females), and the state's Asian and Hispanic students report the lowest rates of binge drinking.

Tobacco Use and Exposure to Secondhand Smoke

Fewer Minnesotans smoke now than in recent history, and the remaining smokers consume fewer cigarettes per day. The proportion of adult heavy smokers in Minnesota (who consume 25 or more cigarettes per day) has shrunk from about 10 percent in 2007 to just over 6 percent in 2010.[113]

Current Minnesota smokers: 2001-2010

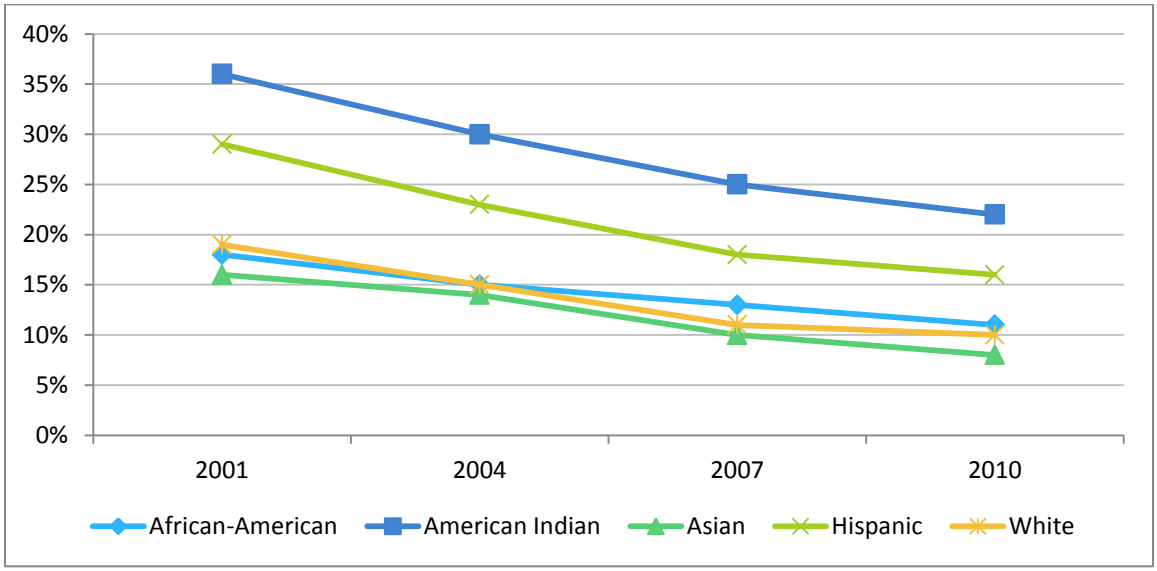


The proportion of both ninth-graders and adults who smoke has decreased in Minnesota during the past decade.

Source: Centers for Disease Control and Prevention. (2011).[114]

Ninth-graders and smoking in Minnesota: 2001-2010

Minnesota ninth-graders who smoked cigarettes during the past 30 days



	2001	2004	2007	2010
African-American	18%	15%	13%	11%
American Indian	36%	30%	25%	22%
Asian	16%	14%	10%	8%
Hispanic	29%	23%	18%	16%
White	19%	15%	11%	10%

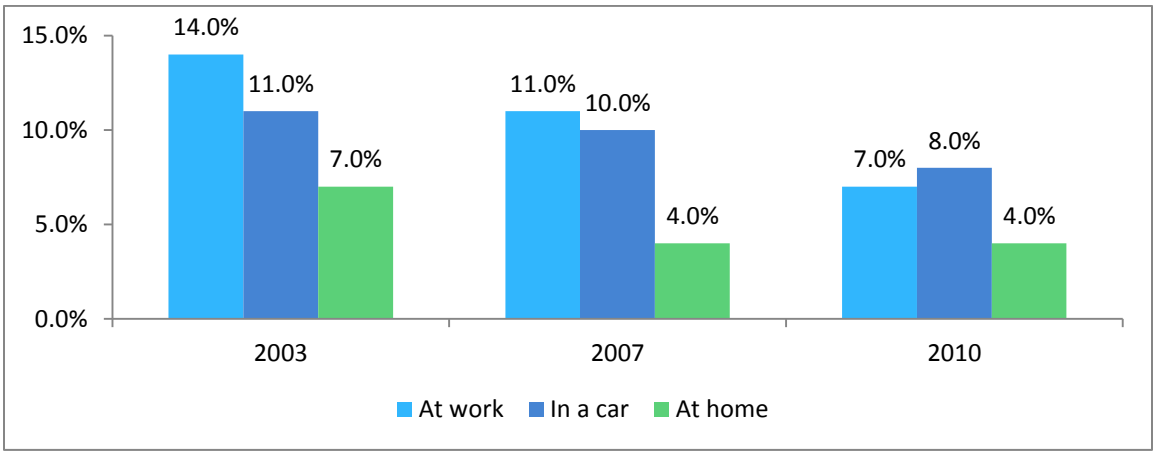
Source: Minnesota Student Survey. (2011).[115]

Secondhand smoke is a mixture of the smoke given off by the burning end of a cigarette, pipe, or cigar, and the smoke exhaled by smokers. Even brief exposure to secondhand smoke puts nonsmokers' health at risk, because of the thousands of chemicals being released into the air. [116]

Since the passage of the state's Freedom to Breathe Act in 2007, more Minnesotans are protected from tobacco smoke in their environments by smoke-free policies at work and voluntary rules at home. In addition, fewer Minnesotans report being exposed to secondhand smoke in all locations.[117]

Minnesota adult nonsmokers and secondhand smoke: 2003-2010

A smaller proportion of Minnesota adults report being exposed to secondhand smoke in 2010 than in 2003.

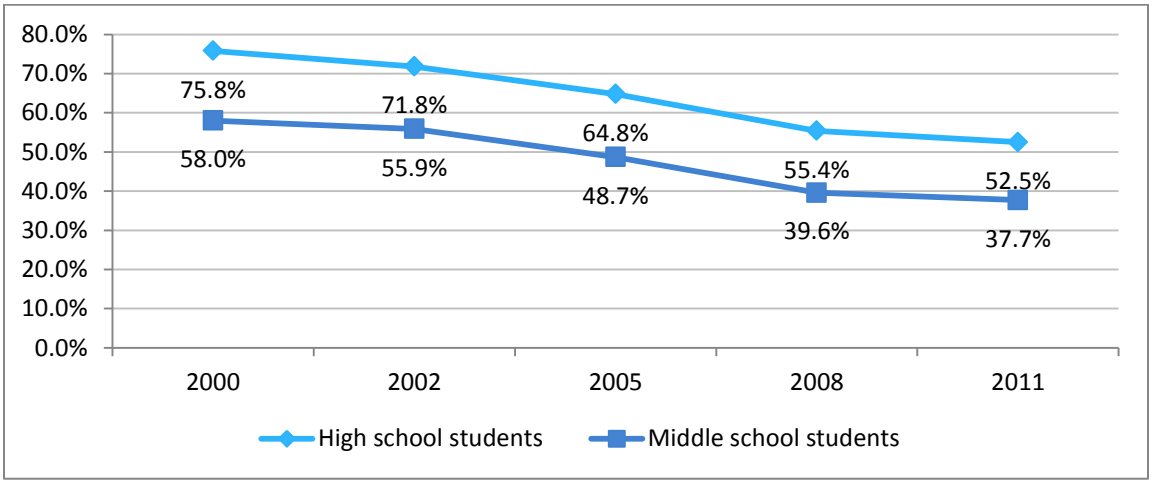


Source: ClearWay Minnesota & Minnesota Department of Health. (2010).[118]

Secondhand smoke exposure among nonsmoking adults has steadily decreased over time since 2003. The percentage of nonsmoking adults exposed to secondhand smoke at work has been cut in half, from 14 to 7 percent.

Secondhand smoke exposure from 2000 to 2011 also declined among youth in middle and high school, although nonsmoking youth in high school (grades 9-12) are more likely to be exposed to secondhand smoke than nonsmoking youth in middle school.

Minnesota students and secondhand smoke: 2000-2011
Percent of students exposed to any secondhand smoke in the past seven days



Source: Minnesota Department of Health, Center for Health Statistics. (2011).[119]

Prescription Drug Use

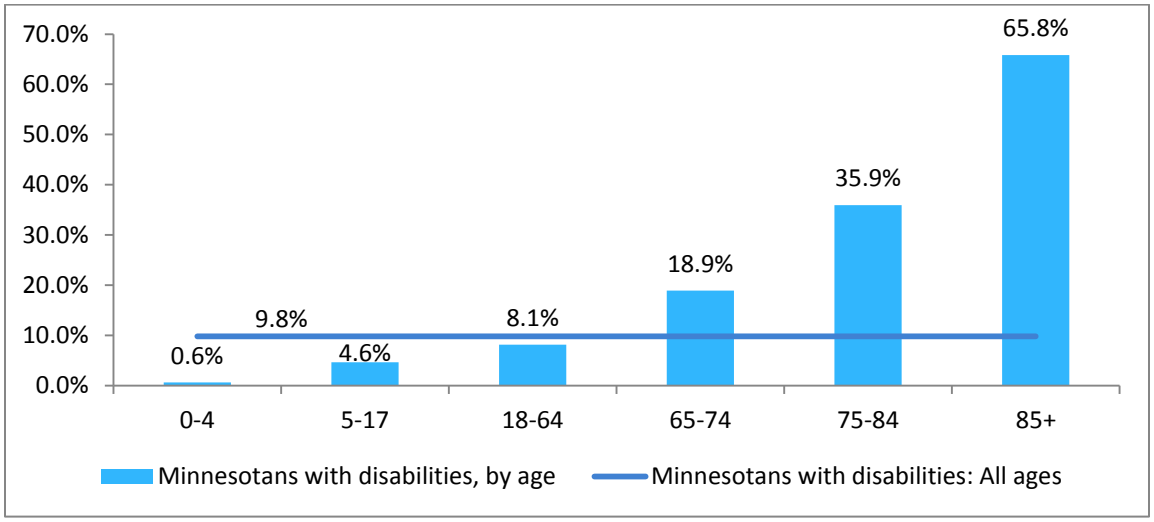
Public health officials in Minnesota and nationwide are growing increasingly concerned about rising rates of improper prescription drug use, and the consequent rise in deaths from accidental overdose of prescription drugs and painkillers. Two million people nationwide reported using prescription painkillers in 2010 non-medically for the first time, and data on injury death[‡‡] show a marked increase in poisoning deaths attributable to the rise in prescription drug abuse.[120]

Preventing and Managing Chronic Conditions

Living with a Disability

Disability can encompass a wide range of factors, including those that involve vision, hearing, movement, ambulation (or the ability to walk), and cognition. This inherent diversity makes estimates of the prevalence of disability in Minnesota vary widely, as organizations count some sorts of disability but not others. According to the U.S. Census Bureau American Community Survey,[§§] nearly 10 percent of the state's population—or almost 514,000 Minnesotans—live with one or more disabilities.[121]

Minnesotans with one or more disabilities: 2010



Source: U.S. Census Bureau. (2011). [122]

It is important to note that disability is not automatically an indicator of poor health. However, individuals with disabilities sometimes find it more challenging to become and remain healthy, due to barriers in their physical and social environments. For example, physical activity is just as important for individuals with disabilities as those without, but accessibility or safety may

---

[‡‡] *For more information on injury deaths in Minnesota, please refer to* ***Part Two****.*

[§§] *The American Community Survey (ACS) defines disability as a restriction in participation that results from a lack of fit between the individual's functional limitations and the characteristics of the physical and social environment. The ACS specifically identifies difficulties in four basic areas of functioning: vision, hearing, ambulation, and cognition.*

become an issue. A disability can also lead to social isolation, which can have a negative impact on mental and physical health. Finally, individuals with disabilities are at a much greater risk for abuse, in the home, at school, and in short- and long-term care settings. These challenges make it evident that all Minnesotans, regardless of ability or disability, need to live in conditions that support a healthy life.

Children with Special Health Care Needs

Children with special health care needs are identified as those who have, or who are at increased risk, for chronic physical, developmental, behavioral, or emotional conditions and who require health and related services of a type or amount beyond that required by normative children.[123] Approximately 14 percent of Minnesota children have special health care needs.[124]

Cancer Screening

Screening for cancer has been shown to be effective in reducing the development of the disease, which is generally more treatable when it is found early before spreading. If screening reveals a problem, diagnosis and treatment, such as removing polyps or other areas of abnormal cell growth, can occur promptly.

Cancer screening in Minnesota and the United States: 2010

Cancer Screening Practices	Minnesota	U.S.
Clinical breast examination among women ≥ 40 years	83.6%	76.5%
Mammography use among women ≥ 40 years	80.7%	75.6%
Pap smear use among women ≥ 18 years	87.5%	81.1%
Fecal occult blood test or sigmoidoscopy/colonoscopy among adults aged ≥ 50 years	62.5%	57.8%

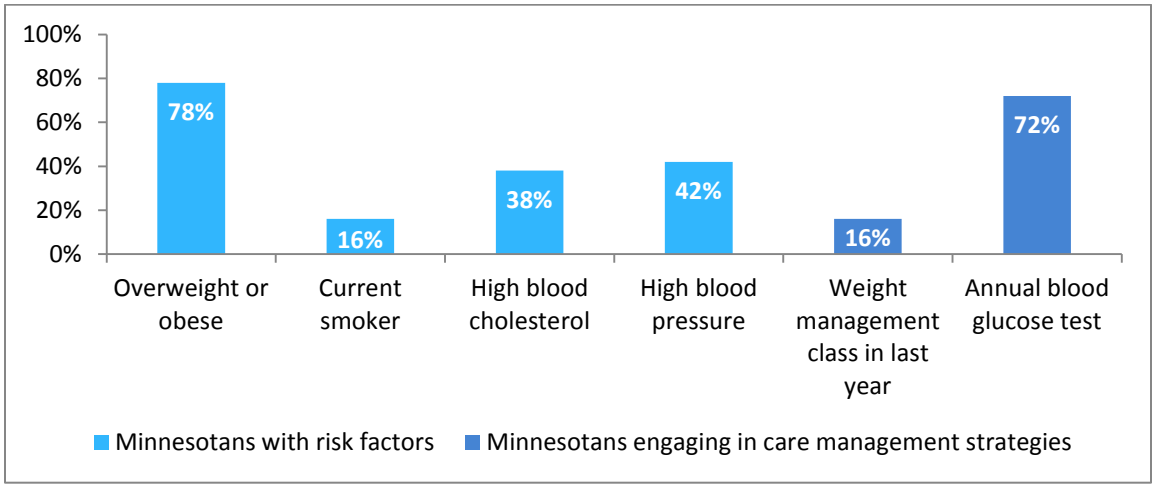
Source: Centers for Disease Control and Prevention. (2010).[125]

Preventing Diabetes

Almost 7 percent of Minnesotans have ever been told by a doctor that they have diabetes—about 355,000 residents statewide (see ***The Health of Minnesota, Part Two***). Another 85,000 are pre-diabetic or borderline diabetic.

A variety of activities can help prevent the development of diabetes, and delay the onset of diabetes for those who are pre-diabetic. Oral medications for those with pre-diabetes can also help, but medications are neither as effective nor as safe as being active, making healthy eating choices, and achieving moderate weight loss. Among Minnesotans with pre-diabetes, over three-fourths are overweight or obese.

Risk factors and care practices among Minnesotans with pre-diabetes: 2007



Among Minnesotans with pre-diabetes, over three-fourths are overweight or obese.

Source: Minnesota Department of Health. (2010).[126]

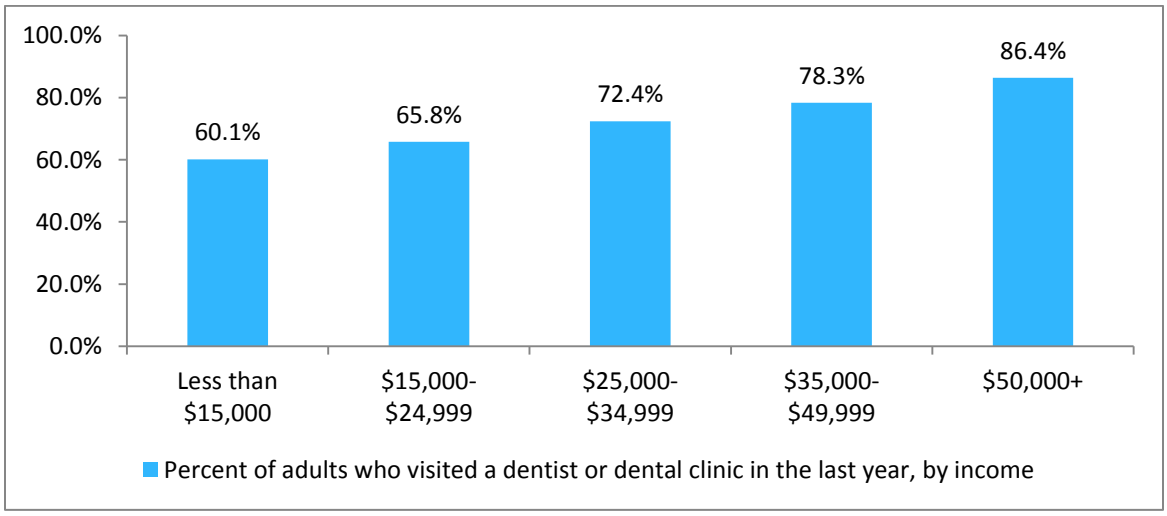
Oral Health

It may seem surprising, but good oral health is essential to overall health, and encompasses more than just dental check-ups. A lack of oral health can lead to cavities (or caries) and gum disease, which can in turn contribute to other diseases or conditions; conversely, certain chronic conditions can also contribute to a decline in oral health. For example, gum disease is associated with endocartis (an infection of the inner lining of the heart), cardiovascular disease, premature birth, and low birth weight. Osteoporosis can lead to tooth loss, and individuals with diabetes and immune system disorders are more susceptible to gum and bone infections. Poor oral health can also affect self-esteem, reduce employment opportunities, and increase absenteeism.

Children of color are less likely to have received dental sealants to prevent caries.

Achieving and maintaining oral health can pose a significant challenge for some Minnesota populations, particularly those with lower incomes.

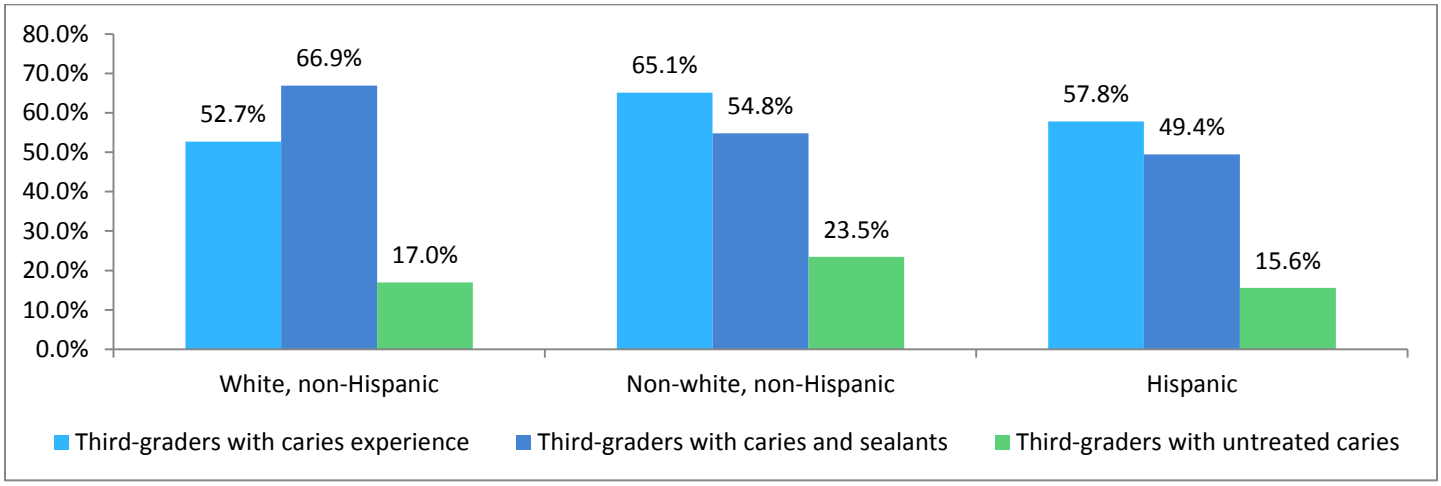
Dental visits and Minnesota adults: 2010



Source: Centers for Disease Control and Prevention. (2010).[127]

Among children worldwide, dental caries is the most common childhood disease. Oral disease is almost completely preventable through optimal fluoride use, application of dental sealants to children's teeth, effective oral hygiene, and regular visits to the dentist.[128]

Minnesota third-graders with caries and sealants: 2010



Source: Minnesota Department of Health, Oral Disease Prevention Unit. (2011). [129]

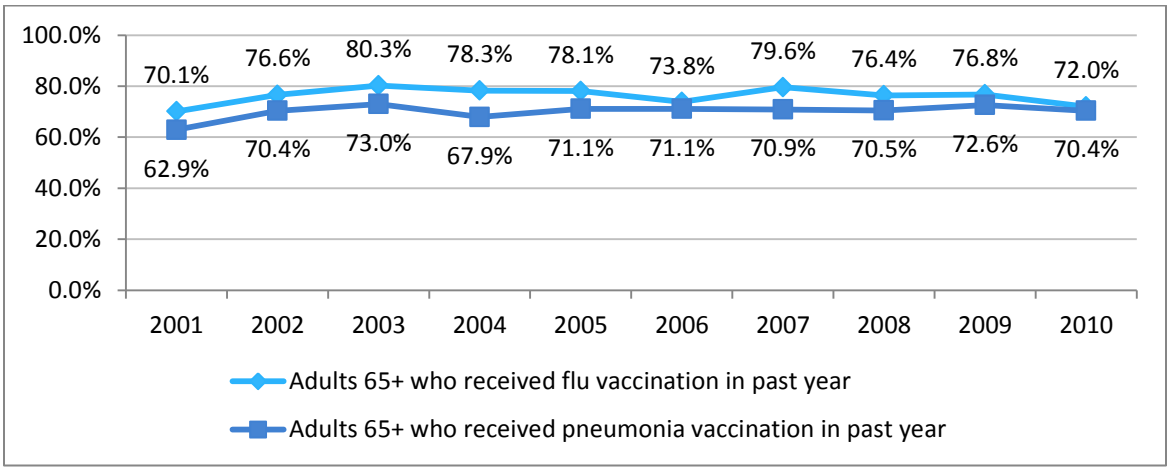
Preventing Disease and Injury

Immunizations

Immunizing individuals, especially children, helps protect the health of the entire community. Immunization is especially important in protecting those who cannot be immunized, such as children too young to be vaccinated, children and adults who cannot be vaccinated for medical reasons, and those who cannot make an adequate response to vaccination. It also protects those who have received a vaccine, but who have not developed immunity to the disease.

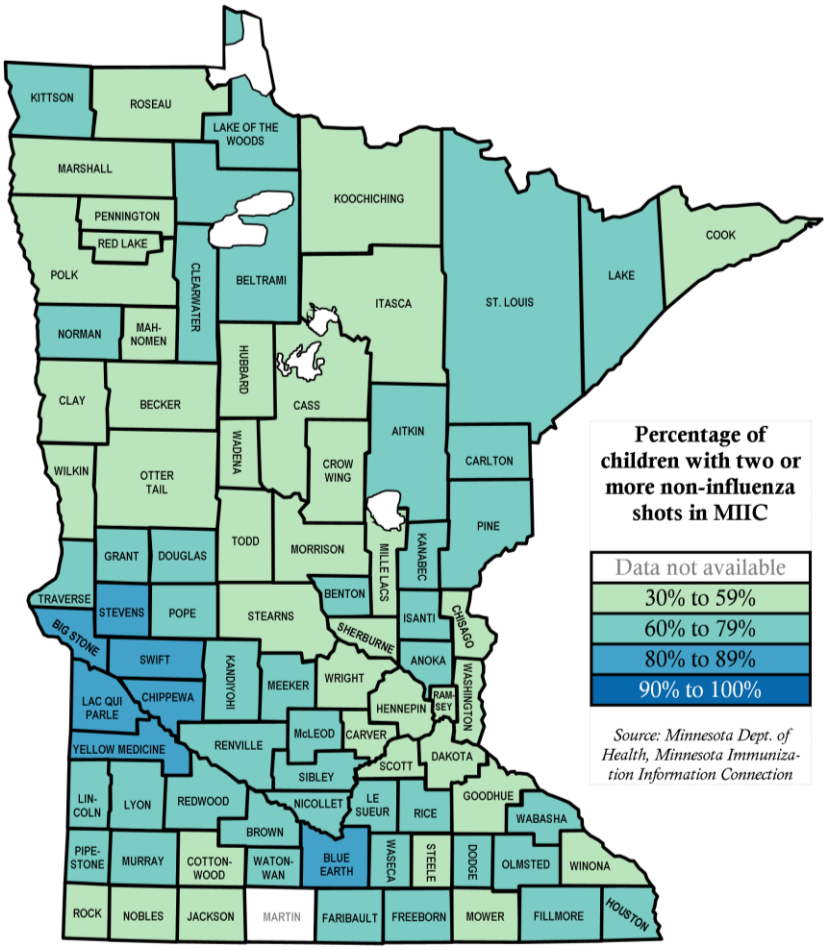
Older adults and immunization in Minnesota: 2001-2010

Nearly the same proportions of adults 65 and older have been immunized against flu and pneumonia in the past year.



Source: Centers for Disease Control and Prevention. (2011).[130]

Children in Minnesota with two or more non-influenza shots in the Minnesota Immunization Information Connection (MIIC): 2011



Immunization also slows and halts disease outbreaks, and lessens the exposure of children and adults to disease germs passed by the unvaccinated. In about half of Minnesota counties, less than 60 percent of children are up-to-date on immunizations; in the majority of Minnesota counties, less than 90 percent of children are up-to-date.*** Statewide, about 58 percent of children have received the entire recommended series of vaccines. ††† [131]

Preventing Sexually Transmitted Infections

Delay of Sexual Activity

One effective way to prevent the transmission of sexually transmitted infections (or STIs, which are also known as sexually transmitted diseases) among youth is to delay the onset of sexual

*** *Childhood immunization rates are measured annually through the Minnesota Immunization Information Connection (MIIC) immunization registry. At least 80 percent of providers participate in MIIC in most counties.*

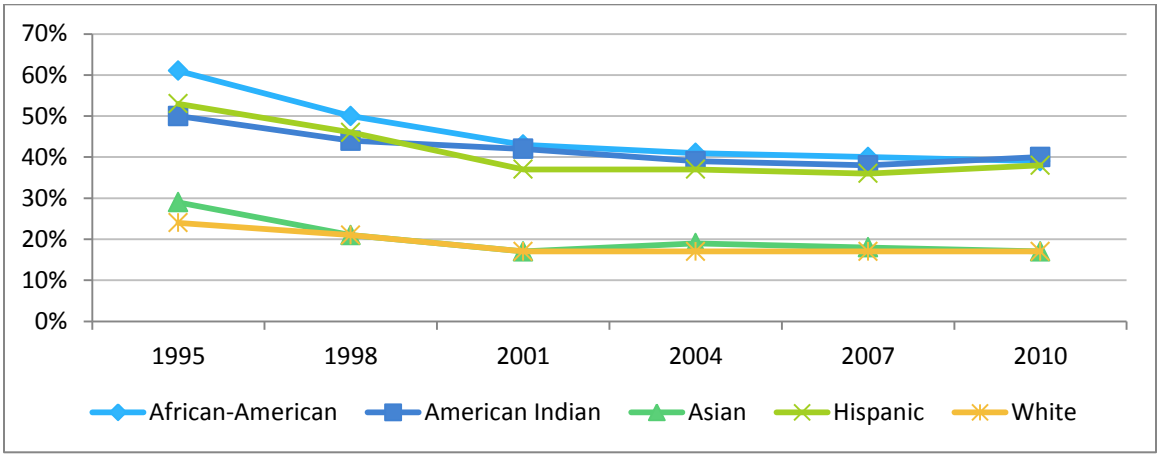
††† *Series of recommended vaccines for children between 24 and 35 months old: 4+ DTaP (Diphtheria, tetanus and acellular pertussis), 3+ polio, 1+ MMR (Measles, mumps and rubella), Completed Hib (Haemophilus influenza type b), 3+ Hep B (Hepatitis B), 1+ varicella (chickenpox), Completed Prevnar (Pneumococcal conjugate vaccine by brand name).*

activity. Minnesota's ninth-graders report lower rates of sexual activity than in the mid-1990s, although this rate has leveled off in recent years.

Minnesota ninth-graders and sexual intercourse: 1995-2010

Minnesota ninth-graders who have had sexual intercourse one or more times in their lifetimes

The proportion of ninth-graders reporting engaging in sexual activity has declined in every racial/ethnic population since 1995.



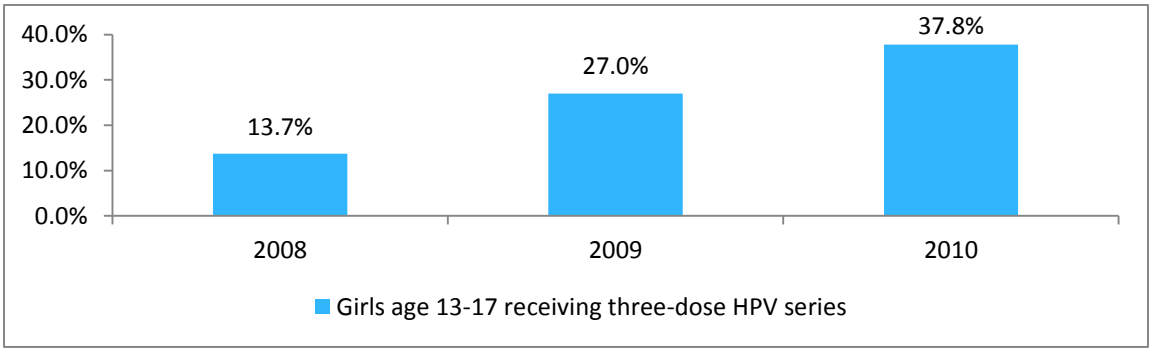
	1995	1998	2001	2004	2007	2010
African-American	61%	50%	43%	41%	40%	39%
American Indian	50%	44%	42%	39%	38%	40%
Asian	29%	21%	17%	19%	18%	17%
Hispanic	53%	46%	37%	37%	36%	38%
White	24%	21%	17%	17%	17%	17%

Source: Minnesota Student Survey. (2011).[132]

Vaccination

Each year in the U.S., about 12,000 women get cervical cancer. Almost all of these cancers are associated with the genital human papillomavirus (also called HPV) virus, the most common sexually transmitted infection. Approximately 20 million Americans are currently infected with HPV. Another 6 million people become newly infected each year. HPV is so common that at least 50 percent of sexually active men and women get it at some point in their lives.

Minnesota teen girls (ages 13-17) and HPV vaccination: 2008-2010



Source: Centers for Disease Control and Prevention. (2010).[133]

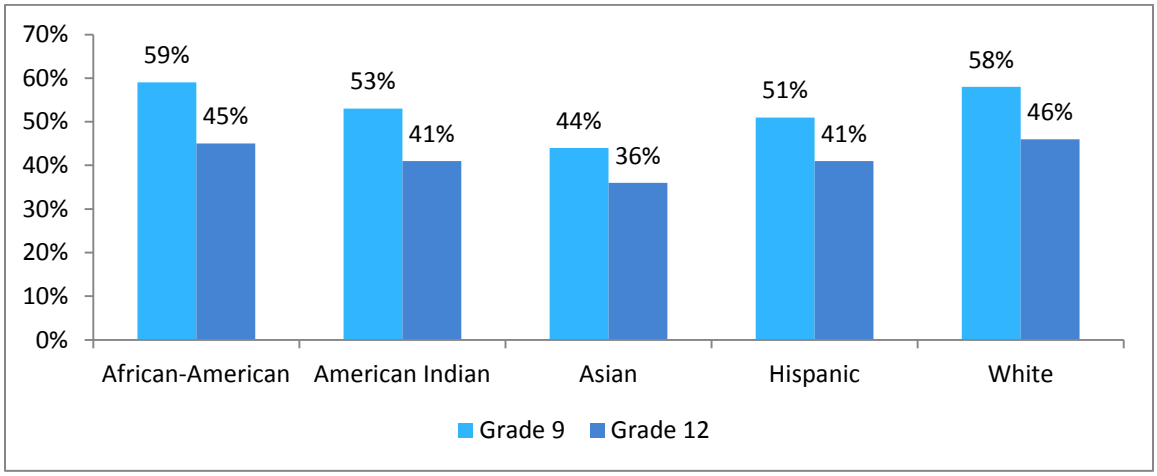
Two vaccines are available to protect females against the types of HPV that cause most cervical cancers and most genital warts. Vaccination is recommended for 11 and 12 year-old girls, and for females 13 through 26 years of age, who did not get any or all of the HPV shots when they were younger. One vaccine is available for boys and men, 9 through 26 years of age, to protect against most genital warts and anal cancers.[134]

In 2010, almost 38 percent of adolescent girls in Minnesota had completed the three-dose series of HPV vaccines, up from 27 percent the year before. The national HPV vaccination rate in 2010 was 32 percent.

Condom Use

Consistent condom use is also an effective way to prevent STIs, and failure to use condoms consistently makes sexually active youth much more vulnerable to STIs. Among sexually active ninth-graders, African-American students are the most likely to report that they "always" use a condom, while Asian students are the least likely to report consistent condom use. Fewer than half of 12th-grade students in all racial/ethnic groups report consistent condom use, although it is possible that those reporting inconsistent use are using other methods of birth control besides or in addition to condoms.

Minnesota students and birth control: 2010
Minnesota students who report that they or their partner "always" use a condom during sexual intercourse



Consistent condom use is reported less frequently by 12th-graders in Minnesota than by 9th-graders.

Source: Minnesota Student Survey. (2011).[135]

Hand washing

Hand washing is one of the easiest and most important actions that anyone can take to prevent disease transmission, yet many people do not consistently wash their hands when appropriate. Three observational studies of hand washing practices in Minnesota found consistent gaps in hand washing between females and males:

- (2003) Back to '50s Car Show Event: 64 percent of females washed their hands; 30 percent of males
- 2003 State Fair: 65 percent of females washed; 39 percent of males
- 2004 State Fair: 75 percent of females washed; 51 percent of males[136]

Safety Belts and Booster Seats

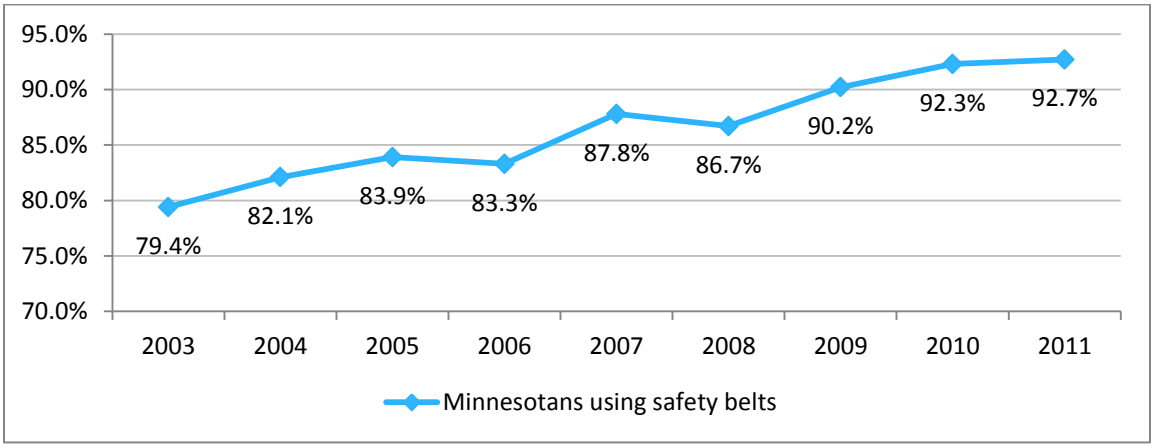
Safety belts and booster seats are highly effective in reducing injury and death from motor vehicle crashes. Minnesota reached a statewide seatbelt use rate of 93 percent in 2011, the highest in the state's history. Rates of use had been steadily increasing since 2003, and increased even more with passage of the state's Primary Seat Belt Law in 2009.[137] The lowest rates of safety belt use can be found among young people, particularly males driving pickup trucks.[138]

Booster seats are also required by law in Minnesota, for children who have outgrown a forward-facing harnessed restraint but who are still too small to correctly fit into an adult safety belt (usually around age four, and for those who weigh between 40 and 60 pounds). In a 2011 survey,

- Two-thirds of children were found to be properly restrained in a booster seat
- Female caregivers were more likely than males to put children in boosters
- Only half of young caregivers (ages 16-29) used booster seats
- If the driver was not wearing a seatbelt, then only 27 percent of the children were in a booster seat[139]

Safety belt use in Minnesota: 2003-2011

Minnesotans' use of safety belts has steadily increased since 2003.



Source: Minnesota Department of Public Safety, Office of Traffic Safety. (2011).[140]

Promoting Mental Health

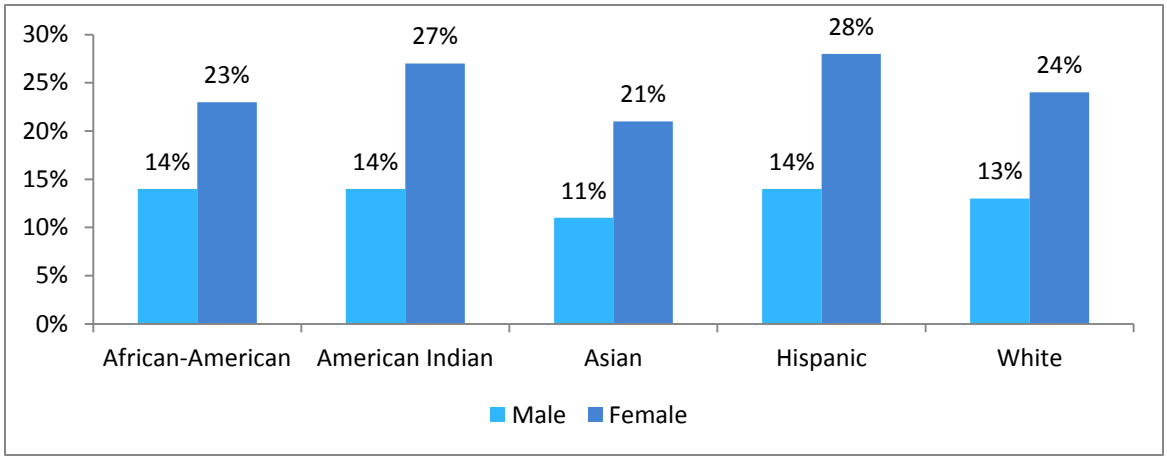
When a person experiences mental or emotional health issues, it can affect his or her everyday functioning. Mental and emotional health struggles can place significant strains on relationships, affect the ability to work, and lead to self-harm. Depression and anxiety can affect a person's ability to participate in health-promoting activities, such as physical activity, and can also disrupt connections to helpful social supports.

Physical or medical conditions can also lead to mental health struggles. Physical pain and depression are strongly associated: More than 65 percent of adults with a mental disorder reported also having at least one general medical disorder. The connections between mental and physical health are complex and move in both directions. Socioeconomic factors, such as low income and poor educational attainment, are associated with both mental disorders and medical conditions.[141]

When adolescents experience emotional distress, it can affect their ability to develop, to learn, and to make sound decisions about their behavior. This distress can also lead to immediate physical dangers in adolescents, like cutting and other forms of self-harm, as well as suicide and attempts at suicide. Minnesota's American Indian and Hispanic students report experiencing higher levels of stress than their peers, and female students report higher rates of emotional stress than males across all races and ethnic groups.

Minnesota ninth-graders and emotional distress: 2010

Minnesota ninth-graders who have felt nervous, worried, or upset "all" or "most of the time" during the last 30 days



Source: Minnesota Student Survey. (2011).[142]

Protective factors like the involvement of caring friends and adults moderate the effects of negative life experiences, and improve the opportunity for positive health outcomes and overall well-being in adolescents. [143] Even one caring adult can make a significant difference in the emotional health of an adolescent.

In Minnesota, three-fourths of ninth-graders in each racial and ethnic group reported feeling that adult relatives besides their parents cared about them "very much" or "quite a bit." More than two-thirds of ninth-graders of color felt that their friends cared about them "very much" or "quite a bit," although white students were the most likely to report feeling that their friends cared about them.

Minnesota ninth-graders who feel that people care about them "very much" or "quite a bit": 2010

"How much do you feel _____ cares about you?"	African-American	American Indian	Asian	Hispanic	White
Other adult relatives	82%	80%	76%	81%	87%
Teachers/other adults	41%	36%	41%	40%	46%
Religious or spiritual leaders	51%	43%	45%	45%	57%
Other adults in the community	36%	32%	33%	35%	44%
Friends	71%	71%	69%	70%	78%

Source: Minnesota Student Survey. (2011).[144]

Conclusion: Meeting Challenges with Strengths

This statewide health assessment identifies many concerns for health, challenges, and significant and alarming disparities in health status among Minnesota's populations. These issues reveal that Minnesota has ample opportunity to improve health; partners intend to focus on this opportunity in *Healthy Minnesota 2020*, the statewide health plan to be developed later in 2012.

However, an assessment of the state would not be complete without a description of the state's strengths and assets. In the context of a statewide health assessment, the concept of "strengths and assets" refers to the many types of human, social, economic, and organizational resources than stakeholders can leverage to improve the health of all, and ensure a healthy future for the state. Minnesotans can make progress not by focusing on problems, but by generating energy and harnessing resources for change.[145]

The Healthy Minnesota Partnership, along with feedback from public commenters, offered numerous suggestions for presenting Minnesota's strengths and assets. Please note: the references offered are provided as examples, but are not a complete listing of all of the state's relevant resources.

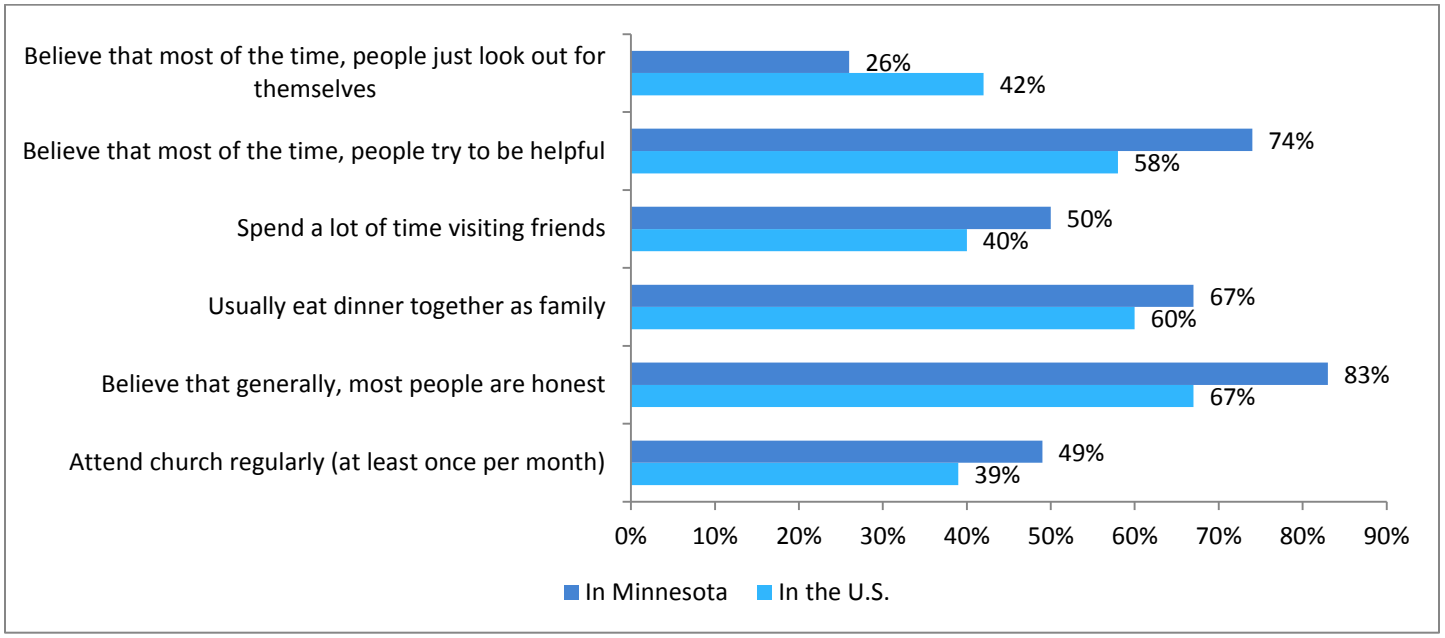
The People of Minnesota

- The children of Minnesota remain the future of the state[146]
- Growing racial, ethnic and cultural diversity brings significant economic contributions and a richness of perspectives, skills, experience, and innovative ideas to the state[147]
- Older Minnesotans provide an invaluable source of wisdom and experience; as retirees they often commit large amounts of time to community involvement and volunteerism[148]
- Minnesota's youth never cease to amaze with their passion for the world and their commitment to make a difference[149]
- Minnesota is a source of innovative and effective leaders at the local, state and national levels

Communities in Minnesota

- Minnesota has a history of caring and extensive community involvement by individuals, families, and organizations. For example, Minnesota ranks third in the nation for its rate of volunteering; the Twin Cities ranks first among large cities[150]
- Minnesota has a commitment to and many years of experience with effective partnerships across a wide variety of public and private sectors, including a unique partnership between state and local public health departments that has grown strong through over 35 years of experience working on public health issues together[151]
- Minnesota is known for a strong non-profit sector, philanthropic foundations, and numerous community-based organizations[152]
- Employers based in Minnesota historically contribute to and participate in the community[153]
- Multiple sectors of Minnesota collaborate with energy and ongoing commitment on a wide variety of efforts[154]
- Minnesota has a high rate of participation in numerous and diverse faith communities with active commitment to helping others[155]
- Minnesotans participate in government and civic life at a high rate[156]

Being community-minded in Minnesota: 2009



Source: Augsburg College. (2009).[157]

Minnesota's Systems

- Minnesota has historically committed to and made a significant investment in education[158]
- Minnesota's vibrant agriculture sector is expanding the availability of farmers' markets, to create economic opportunity and make fresh food more available in local communities[159]
- Minnesota has an international reputation of having a high-quality health care system and medical research, and state-of-the-art medical centers[160]
- Minnesota is known internationally for its strong business community[161]
- Visitors and residents can find a variety of tourist destinations throughout the state, as well as an extensive system of parks and trails[162]
- Minnesotans are protected from the unexpected with highly effective disease surveillance, health protection, and emergency response systems[163]

The "Minnesota Approach"

- Minnesota has a national reputation for and a history of innovative and forward-thinking initiatives. State partnerships work to eliminate health disparities;[164] focus on policy, systems, and environmental change;[165] and engage the business community in creating greater opportunity by working to remove socioeconomic inequality[166]
- Minnesota's researchers and practitioners regularly collaborate to develop innovative and effective solutions to challenging problems[167]
- A number of Minnesota institutions use multi-sector, multi-discipline, and cross-cutting collaborative approaches to create lasting change[168]
- Minnesota encourages a growing environmental awareness and commitment to land stewardship[169]
- Minnesotans ingenuously and proactively work toward building sustainable communities[170]

Appendix: Healthy Minnesota Partnership

Charge

The Healthy Minnesota Partnership was created to develop innovative public health priorities, goals, objectives, and strategies to improve the health of all Minnesotans, and to ensure ownership of these objectives and priorities in communities across the state of Minnesota. The Healthy Minnesota Partnership resides online: http://www.health.state.mn.us/healthymnpartnership/

Membership

The efforts of the Healthy Minnesota Partnership are intended to benefit the state as a whole, and the membership of the partnership reflects a broad spectrum of interests.

As of April 2012, the following organizations were represented in the Healthy Minnesota Partnership:

Jeanne Ayers
Minnesota Department of Health

Alfred Babington-Johnson
StairStep Foundation

Ken Bence
Minnesota Public Health Association

Kari Benson
Minnesota Board on Aging

Janny Dwyer Brust
Minnesota Council of Health Plans

Karen Cadigan
Minnesota Department of Education

Rachel Callanan
American Heart Association

Michael Connelly
Xcel Energy

Rhonda Degelau
Minnesota Association of
Community Health Centers

Liz Doyle
TakeAction Minnesota

Ed Ehlinger
Minnesota Department of Health

John R. Finnegan, Jr.
University of Minnesota
School of Public Health

Hector Garcia
Chicano Latino Affairs Council

Lauren Gilchrist
Governor's Office

Jim Halstrom
Association of
Minnesota Emergency Managers

Kao Ly Ilean Her
Council on Asian-Pacific
Minnesotans

Annamarie Hill-Kleinhans
Indian Affairs Council

Neal Holtan
Medical Consultant

Mary Klimp
Minnesota Hospital Association

Warren Larson
Sanford Health

Natalie Johnson Lee
Council on Black Minnesotans

Marianne Keuhn
Minnesota Chapter, March of Dimes

Carolyn Link
Blue Cross Blue Shield
of Minnesota Foundation

Susan Morris
State Community Health
Services Advisory Committee

Gretchen Musicant
Local Public Health Association
(Metro)

Kami Norland
National Rural Health Resource
Center

Ferd Schlapper
Boynton Health Services

Doran Schranz
ISAIAH

Tom Sorel
Minnesota Dept. of Transportation

Barb Sporlein
Minnesota Housing Finance Agency

Maria Veronica Svetaz
Hennepin County Medical Center

Deborah L. Swackhamer
Water Resources Center

Donna Zimmerman
Itasca Project

TBD: Local Public Health
Association (Greater MN)

Alternates

Ann Bajari
Minnesota Public Health Association

Carol Berg
Minnesota Council of Health Plans

Jackie Keaveny
Minnesota Board on Aging

Kristin Loncorich
Minnesota Hospital Association

Todd Monson
Local Public Health Association (Metro)

Stacey Millett
Blue Cross Blue Shield of Minnesota Foundation

Carmen Reckard
Local Public Health Association (Greater MN)

Jolynn Shopteese
Indian Affairs Council

Janet L. Silversmith
Minnesota Medical Association

Faye Sleeper
Water Resources Center

Nick Thompson
Minnesota Department of Transportation

Resources and References

The Health of Minnesota, Part Two (http://www.health.state.mn.us/statewidehealthassessment)

Part Two of *The Health of Minnesota* provides information chronic diseases and conditions, infections disease, and injury and violence.

Minnesota Center for Health Statistics (http://www.health.state.mn.us/divs/chs/)

The Minnesota Center for Health Statistics coordinates, collects and analyses a wide range of Minnesota health-related data, including data from the U.S. Census Bureau, the Centers for Disease Control and Prevention (CDC), the Minnesota Student Survey, and other programs within the Minnesota Department of Health.

Behavioral Risk Factor Surveillance System (http://www.cdc.gov/brfss/)

The Behavioral Risk Factor Surveillance System, administered by the Centers for Disease Control and Prevention (CDC) is the world's largest ongoing telephone health survey system, and has tracked health conditions and risk behaviors in the United States yearly since 1984. Currently, data are collected monthly in all 50 states, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and Guam.

Minnesota Student Survey (http://www.health.state.mn.us/divs/chs/mss/)

The Minnesota Student Survey is the result of collaboration between Minnesota schools and the Minnesota Departments of Education, Employment and Economic Development, Health, Human Services and Public Safety. The survey is administered every three years to sixth, ninth, and 12th-grade students.

Atlas of Minnesota Online (http://www.ruralmn.org/atlas-outline/)

The Atlas of Minnesota Online is administered by the Center for Rural Policy and Development, and provides data in map form for a number of social and economic characteristics of Minnesota.

Minnesota: People and Place: Additional Resources

Population Overview

Minnesota State Demographic Center. Retrieved from http://www.demography.state.mn.us/

Minnesota Department of Health, Office of Rural Health and Primary Care. (Revised 2011). *Health status of rural Minnesotans.* Retrieved from http://www.health.state.mn.us/divs/orhpc/pubs/workforce/status.pdf

Immigration and Growing Diversity

Minnesota State Demographic Center. (2011). *Demography A-Z: Immigration*. Retrieved January 1 2012 from http://www.demography.state.mn.us/a2z.html#Immigration

Aging and Retirement

Gillaspy, T. & McMurray, M. (2011). *The long run has become the short run: Budget implications of demographic change*. Minnesota State Demographic Center. Retrieved from http://www.demography.state.mn.us/documents/LongRun.pdf

Water, Weather, and the Air

Minnesota Department of Natural Resources. (2011). *Nature*. Retrieved January 1 2012 from http://www.dnr.state.mn.us/nr/

Minnesota Department of Health. *Environmental Health Topic Index*. Retrieved January 1 2012 from http://www.health.state.mn.us/divs/eh/topics.html

Minnesota Pollution Control Agency. *Groundwater in Minnesota*. Retrieved January 1 2012 from http://www.pca.state.mn.us/index.php/water/water-types-and-programs/groundwater/groundwater.html

University of Minnesota Water Resources Center. *Minnesota Water Sustainability Framework*. Retrieved January 1 2012 from http://wrc.umn.edu/watersustainabilityframework/

Minnesota Department of Health. (2011). *Minnesota Public Health Data Access: Air quality*. Retrieved January 1 2012 from https://apps.health.state.mn.us/mndata/air

Minnesota Department of Health. *Climate change*. Retrieved January 1 2012 from http://www.health.state.mn.us/divs/climatechange/

Minnesota Department of Health. (2011). *Minnesota Public Health Data Access: Carbon monoxide*. Retrieved January 1 2012 from https://apps.health.state.mn.us/mndata/co

Minnesota Department of Health. *Waterline* [Newsletter]. Retrieved from http://www.health.state.mn.us/divs/eh/water/com/waterline/

The Opportunity for Health in Minnesota: Additional Resources

Robert Wood Johnson Foundation. (2011). *What shapes health?* Retrieved January 1 2012 from http://www.rwjf.org/pr/product.jsp?id=72455

Outdoor and Indoor Environments

America Walks. *Resources and data: Benefits of a walkable community*. Retrieved January 20 2012 from http://americawalks.org/resources/benefitsofawalkablecommunity/

Walk Score. *Walkable neighborhoods*. Retrieved January 20 2012 from http://www.walkscore.com/walkable-neighborhoods.shtml

Robert Wood Johnson Foundation. *Active living research*. Retrieved January 20 2012 from http://www.activelivingresearch.org/

Social Connectedness

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

Access to Health Care

Minnesota Department of Health. *Minnesota Health Access Survey* [Data set]. Retrieved January 1 2012 from https://pqc.health.state.mn.us/mnha/Welcome.action

Healthy Living in Minnesota: Additional Resources

A Healthy Start for Children

Mathews, T.J., Sutton, P.D., Hamilton, B.E., & Ventura, S.J. (2010). *State disparities in teenage birth rates in the United States.* Centers for Disease Control and Prevention, National Center for Health Statistics. Retrieved from http://www.cdc.gov/nchs/data/databriefs/db46.pdf

Kirby, D. (2007). *Emerging answers: Research findings on programs to reduce teen pregnancy and sexually transmitted diseases*. The National Campaign to Prevent Teen and Unwanted Pregnancy. Retrieved from http://www.thenationalcampaign.org/EA2007/EA2007_full.pdf

Hoffman, S.D. (2006). *By the numbers: The public costs of adolescent childbearing*. The National Campaign to Prevent Teen and Unwanted Pregnancy. Retrieved from http://www.thenationalcampaign.org/resources/pdf/pubs/btn_full.pdf

Haveman, R.H., Wolfe, B., & Peterson, E. (1997). Children of early childbearers as young adults. In R. Maynard (Ed.), *Kids having kids: Economic costs and social costs of teen pregnancy* (pp. 257-284). Washington, DC: The Urban Institute Press.

Physical Activity and Eating Habits

Blue Cross and Blue Shield of Minnesota & Minnesota Department of Health. (2010). *Physical activity and healthy eating in Minnesota: Addressing the root causes of obesity*. Retrieved from http://www.health.state.mn.us/divs/hpcd/chp/cdrr/obesity/pdfdocs/ReportBCBSaddressrootcausesobesity.pdf

From the Text: Endnotes

[1] World Health Organization. (1946; Revised 2006). *Constitution of the World Health Organization: Preamble*. Retrieved January 1 2012 from http://www.who.int/governance/eb/who_constitution_en.pdf
[2] Institute of Medicine. (1988). *The future of public health*. Washington, DC: National Academy Press.
[3] Minnesota Department of Health, Minnesota Department of Human Services. (2011). *Collection of racial/ethnic health data by*
[3] Minnesota Department of Health, Minnesota Department of Human Services. (2011). *Collection of racial/ethnic health data by the Minnesota Departments of Health and Human Services.* Retrieved from http://www.health.state.mn.us/ommh/publications/racialethnicdata2011.pdf
[4] World Health Organization. *Social determinants of health*. Retrieved April 2 2012 from http://www.who.int/social_determinants/en/ and Centers for Disease Control and Prevention. *Social determinants of health*. Retrieved April 2 2012 from http://www.cdc.gov/socialdeterminants/
[5] Dahlgren, G., & Whitehead M. (1991). *Policies and strategies to promote social equity in health*. Stockholm, Sweden: Institute of Futures Studies.
[6] Heise, L.L. (1998). Violence against women: An integrated, ecological framework. *Violence Against Women 4*(3), 262-290.
[7] U.S. Department of Health and Human Services. (Updated 2011). *HealthyPeople.gov: About Healthy People*. Retrieved January 1 2012 from http://www.healthypeople.gov/2020/about/default.aspx
[8] Centers for Disease Control and Prevention. (Updated 2010). *Healthy Places: About Healthy Places*. Retrieved January 1 2012 from http://www.cdc.gov/healthyplaces/about.htm
[9] Shonkoff, J.P. & Phillips, D.A. (Eds.). (2000). *From neurons to neighborhoods: The science of early childhood development.* Washington, D.C.: National Academy Press. Retrieved from http://www.nap.edu/openbook.php?record_id=9824
[10] Harvard University, Center on the Developing Child. (2010). *How early experiences get into the body: A biodevelopmental framework.* Retrieved April 2 2012 from http://developingchild.harvard.edu/index.php/resources/multimedia/interactive_features/biodevelopmental-framework/

[11] United Health Foundation. (2011). *America's Health Rankings: 2011 rankings* [Data]. Retrieved January 1 2012 from http://www.americashealthrankings.org/MN
[12] Centers for Disease Control and Prevention. (2010). Retrieved January 21 2012 from http://wonder.cdc.gov/
[13] Minnesota Department of Health, Minnesota Center for Health Statistics. (2011).
[14] Minnesota State Demographic Center. (2009). *Minnesota population projections by race and Hispanic origin, 2000 to 2035*. Retrieved from http://www.demography.state.mn.us/documents/MinnesotaPopulationProjectionsbyRaceandHispanicOrigin2005to2035.pdf
[15] U.S. Census Bureau. (2011).
[16] U.S. Census Bureau. (2011).
[17] Council on Asian Pacific Minnesotans. (2011). *Asian and Native Hawaiian and other Pacific Islander population: U.S. Census 2010 and American Community Survey 2008-2010 short report*. Retrieved from http://www.capm.state.mn.us/pdf/2010demographicreport.pdf
[18] U.S. Census Bureau. (2011).
[19] U.S. Census Bureau. (2011).
[20] Minnesota Department of Natural Resources. (2008). *Lakes, rivers, and wetland facts*. Retrieved January 1 2012 from http://www.dnr.state.mn.us/faq/mnfacts/water.html
[21] Minnesota Department of Health. (2011). *Minnesota Public Health Data Access: Drinking water quality*. Retrieved January 1 2012 from https://apps.health.state.mn.us/mndata/drinkingwater
[22] Minnesota Department of Health. (2011). *Minnesota Public Health Data Access: Drinking water quality: Arsenic*. Retrieved January 1 2012 from https://apps.health.state.mn.us/mndata/arsenic-messaging
[23] National Climatic Data Center. (2006). *Climate of Minnesota.* Retrieved April 2 2012 from http://cdo.ncdc.noaa.gov/climatenormals/clim60/states/Clim_MN_01.pdf
[24] Seeley, M. & Zandlo, J. (2010). *Climate change in Minnesota: Current trends and projections*. Retrieved from http://climate.umn.edu/seeley/climate_summit_2010.ppt
[25] Seeley, M. (Updated 2011). *Mark Seeley's Weather and Climate Information Resources*. Retrieved January 1 2012 from http://climate.umn.edu/seeley/
[26] Minnesota Department of Natural Resources. (2008). *Climate*. Retrieved April 2, 2012 from http://www.dnr.state.mn.us/faq/mnfacts/climate.html
[27] Minnesota Department of Health. *Radon in Minnesota homes*. Retrieved January 1 2012 from http://www.health.state.mn.us/divs/eh/indoorair/radon/
[28] Minnesota Pollution Control Agency. (2012).
[29] Minnesota Department of Transportation. (2011). *Capital programs: State Transportation Improvement Program*. Retrieved April 2 2012 from http://www.dot.state.mn.us/planning/program/stip.html
[30] Minnesota Department of Transportation. (2011). *MnDOT performance measurement: Transportation performance reporting and management at MnDOT*. Retrieved April 2 2012 from http://www.dot.state.mn.us/measures/
[31] Grady Barbaccia, T. (2011, November 11). The state of our bridges. *Better Roads.* Retrieved April 2 2012 from http://www.betterroads.com/the-state-of-our-bridges/
[32] Toward Zero Deaths. Retrieved April 2 2012 from http://www.minnesotatzd.org/
[33] Minnesota Department of Transportation. (2012). *Metropolitan freeway system 2011 congestion report.* Retrieved from http://www.dot.state.mn.us/congestionreport/CongestionReport2011.pdf
[34] Robert Wood Johnson Foundation. (2011). *Exploring the social determinants of health: Education matters for health*. Retrieved from http://www.rwjf.org/files/research/sdohseries2011education.pdf
[35] American Cancer Society, Midwest Division. (2011). *Minnesota cancer facts and figures: 2011*. Retrieved from http://www.health.state.mn.us/divs/hpcd/cdee/mcss/documents/mncancerfactsfigures2011033011.pdf
[36] MN Compass. (2011). *Education: Overview*. Analysis of data from the Minnesota Department of Education. Retrieved January 1 2012 from http://www.mncompass.org/education/
[37] Austin, A. (2010). *Uneven pain: Unemployment by metropolitan area and race*. Economic Policy Institute. Retrieved from http://www.epi.org/page/-/ib278/ib278.pdf
[38] Austin, A. (2010). *Uneven pain: Unemployment by metropolitan area and race*. Economic Policy Institute. Retrieved from http://www.epi.org/page/-/ib278/ib278.pdf
[39] U.S. Census Bureau, American Community Survey. (2011).
[40] U.S. Census Bureau, American Community Survey. (2011).
[41] Luechtefeld, S. (2011). *CFED research release highlights Twin Cities' financial insecurity* [Blog post]. Corporation for Enterprise Development. Retrieved from http://cfed.org/blog/inclusiveeconomy/cfed_research_release_highlights_financial_insecurity/
[42] U.S. Census Bureau, American Community Survey. (2011).

[43] Robert Wood Johnson Foundation. (2011). *Exploring the social determinants of health: How social factors shape health: The role of stress*. Retrieved from http://www.rwjf.org/files/research/sdohstressandhealthissuebrief20110324.pdf
[44] U.S. Department of Agriculture, Economic Research Service. (2010). *Food security in the U.S.: Current Population Survey Food Security Supplement*. Analysis of data from Current Population Survey Food Security Supplement [Data set]. Retrieved January 1 2012 from http://www.ers.usda.gov/Data/foodsecurity/cps/
[45] U.S. Department of Agriculture, Economic Research Service. (2011). *Food security in the U.S.: Key statistics and graphics*. Retrieved January 1 2012 from http://www.ers.usda.gov/Briefing/FoodSecurity/stats_graphs.htm
[46] Feeding America. (2011). *Map the meal gap*. Retrieved January 1 2012 from http://feedingamerica.org/hunger-in-america/hunger-studies/map-the-meal-gap.aspx
[47] Dietz, R.D. (2003). *The social consequences of homeownership*. Ohio State University: Department of Economics and the Center for Urban and Regional Analysis. Retrieved from http://web.mit.edu/~cwuz/Public/14.33/dietz%20social_consequences.pdf
[48] Corporation for Enterprise Development (CFED). (2011). *Assets and opportunity profile: Minneapolis*. Retrieved January 1 2012 from http://cfed.org/assets/pdfs/minneapolis_ao_profile.pdf. *Assets and opportunity profile: St. Paul*. Retrieved January 1 2012 from http://cfed.org/assets/pdfs/stpaul_ao_profile.pdf
[49] Corporation for Enterprise Development (CFED). (2011). *Assets and opportunity profile: Minneapolis*. Retrieved January 1 2012 from http://cfed.org/assets/pdfs/minneapolis_ao_profile.pdf. *Assets and opportunity profile: St. Paul*. Retrieved January 1 2012 from http://cfed.org/assets/pdfs/stpaul_ao_profile.pdf
[50] HealthyPeople.gov. Retrieved February 24 2012 from http://www.healthypeople.gov/2020/
[51] Centers for Disease Control and Prevention. (2010). *State indicator report on physical activity*. Retrieved from http://www.cdc.gov/physicalactivity/downloads/PA_State_Indicator_Report_2010.pdf
[52] Mowen, A. (2010). *Parks, playgrounds, and active living*. Active Living Research. Retrieved from http://www.activelivingresearch.org/files/Synthesis_Mowen_Feb2010.pdf
[53] Minnesota Department of Health, Environmental Health Division. *Lead poisoning prevention*. Retrieved January 1 2012 from http://www.health.state.mn.us/lead
[54] Minnesota Department of Health, Environmental Health Division. *Mold and moisture in homes*. Retrieved January 1 2012 from http://www.health.state.mn.us/divs/eh/indoorair/mold/index.html
[55] Centers for Disease Control and Prevention, Agency for Toxic Substances and Disease Registry. (2008). *Asbestos: health effects*. Retrieved January 1 2012 from http://www.atsdr.cdc.gov/asbestos/asbestos/health_effects/
[56] Minnesota Department of Health, Office of Public Health Practice. (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
[57] U.S. Census Bureau, American Community Survey. (2010).
[58] Minnesota Board on Aging. (2005). *Survey of Older Minnesotans* [Data set]. Retrieved January 1 2012 from http://www.mnaging.org/advisor/survey.htm
[59] Metropolitan Area Agency on Aging. (2009). *2008 Minnesota Behavioral Risk Factor Surveillance Survey caregiving module*. Analysis of data from Centers for Disease Control and Prevention: Behavioral Risk Factor Surveillance System: 2008 caregiving module. Retrieved from http://www.tcaging.org/downloads/2008caregiver.pdf
[60] Metropolitan Area Agency on Aging. (2009). *2008 Minnesota Behavioral Risk Factor Surveillance Survey caregiving module*. Analysis of data from Centers for Disease Control and Prevention: Behavioral Risk Factor Surveillance System: 2008 caregiving module. Retrieved from http://www.tcaging.org/downloads/2008caregiver.pdf
[61] Robert Wood Johnson Foundation & University of Wisconsin Population Health Institute. *County Health Rankings: Family and social support*. Retrieved January 1 2012 from http://www.countyhealthrankings.org/health-factors/family-and-social-support
[62] U.S. Census Bureau. (2011).
[63] Minnesota Department of Health, Center for Health Statistics. (2011). *Minnesota Student Survey*. Retrieved January 1 2012 from http://www.health.state.mn.us/divs/chs/mss/
[64] Wildeman, C. (2010). *Incarceration and population health in wealthy democracies.* Retrieved February 24 2012 from http://www.yale.edu/ciqle/CIQLEPAPERS/Wildeman%28Crossnational%29.pdf
[65] London, A.S. & Myers, N.A. (2006). Race, incarceration, and health: A life-course approach. *Research on Aging 28*(3): 409-422.
[66] Mauer, M. & King, R.S. (2007). *Uneven justice: State rates of incarceration by race and ethnicity*. The Sentencing Project. Retrieved from http://www.sentencingproject.org/doc/publications/rd_stateratesofincbyraceandethnicity.pdf
[67] Mauer, M. & King, R.S. (2007). *Uneven justice: State rates of incarceration by race and ethnicity*. The Sentencing Project. Retrieved from http://www.sentencingproject.org/doc/publications/rd_stateratesofincbyraceandethnicity.pdf

[68] Minnesota Department of Health, Office of Public Health Practice. (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
[69] Minnesota Department of Health, Center for Health Statistics. (2011). *Minnesota Student Survey*. Retrieved January 1 2012 from http://www.health.state.mn.us/divs/chs/mss/
[70] Greater Twin Cities United Way & Minnesota Department of Public Safety, Office of Justice Programs. (2009). *Domestic violence: Results from the 2008 Minnesota Crime Victim Survey*. Retrieved from https://www.unitedwaytwincities.org/_asset/fphxh5/2009_Domestic_Violence_Report.pdf
[71] Greater Twin Cities United Way & Minnesota Department of Public Safety, Office of Justice Programs. (2011). *Domestic violence. Top line summary: 2010. Minnesota Crime Victim Survey*. Retrieved from http://unitedfrontmn.org/family-violence/files/2011/08/MN_Crime_Victim_Survey_Summary_2010_reduced-size.pdf
[72] U.S. Department of Health and Human Services, Office of the National Coordinator. (2011).
[73] Minnesota Board of Medical Practice. (2011).
[74] Minnesota Board of Dentistry. (2011).
[75] Minnesota Department of Health, Health Economics Program. (2012). *Health insurance coverage in Minnesota, early results from the 2011 Minnesota Health Access Survey.* Retrieved April 13 2012 from http://www.health.state.mn.us/divs/hpsc/hep/publications/coverage/healthinscovmhas2011.pdf
[76] Minnesota Department of Health, Health Economics Program. (2012). *Health insurance coverage in Minnesota, early results from the 2011 Minnesota Health Access Survey.* Retrieved April 13 2012 from http://www.health.state.mn.us/divs/hpsc/hep/publications/coverage/healthinscovmhas2011.pdf
[77] Minnesota Department of Health, Health Economics Program. (2010). *Minnesota Health Access Survey* [Data set]. Retrieved January 1 2012 from https://pqc.health.state.mn.us/mnha/Welcome.action
[78] United Health Foundation. (2011). America's Health Rankings 2011. Retrieved from http://www.americashealthrankings.org/SiteFiles/Statesummary/MN.pdf
[79] Minnesota Department of Health, Emergency Preparedness. (2007). Ready to respond. Retrieved February 24 2012 from http://www.health.state.mn.us/oep/news/07feb.html
[80] Minnesota Department of Public Safety. (2011). *Minnesota all-hazard mitigation plan update.* Retrieved from https://dps.mn.gov/divisions/hsem/hazard-mitigation/Documents/2011%20Minnesota%20All-Hazard%20Mitigation%20Plan%20Update.pdf
[81] Minnesota Department of Health, Center for Health Statistics. (2011).
[82] Minnesota Department of Health, Minnesota Center for Health Statistics. (2011).
[83] Centers for Disease Control and Prevention & U.S. Department of Health and Human Services. (2007). *Preventing smoking and exposure to secondhand smoke before, during, and after pregnancy*. Retrieved from http://www.health.state.mn.us/divs/fh/mch/mortality/documents/CDCsmokingPGfactsheet.pdf
[84] Minnesota Department of Health. (2011). *Minnesota Pregnancy Risk Assessment Monitoring System (PRAMS)* [Data set]. Retrieved January 1 2012 from http://apps.nccd.cdc.gov/cPONDER/
[85] Minnesota Department of Health. (2011). *Minnesota Pregnancy Risk Assessment Monitoring System (PRAMS)* [Data set]. Retrieved January 1 2012 from http://apps.nccd.cdc.gov/cPONDER/
[86] Minnesota Department of Health. (2011). *Minnesota Pregnancy Risk Assessment Monitoring System (PRAMS)* [Data set]. Retrieved January 1 2012 from http://apps.nccd.cdc.gov/cPONDER/
[87] Minnesota Department of Health. (2011). *Minnesota Pregnancy Risk Assessment Monitoring System (PRAMS)* [Data set]. Retrieved January 1 2012 from http://apps.nccd.cdc.gov/cPONDER/
[88] US Department of Health and Human Services. (2011). *The Surgeon General's call to action to support breastfeeding.* Retrieved April 2 2012 from http://www.surgeongeneral.gov/topics/breastfeeding/
[89] Centers for Disease Control and Prevention. (2011). *Breastfeeding report card 2011*. Retrieved January 1 2012 from http://www.cdc.gov/breastfeeding/data/reportcard2.htm
[90] Centers for Disease Control and Prevention. *Adverse Childhood Experiences study.* Retrieved February 24 2012 from http://www.cdc.gov/ace/outcomes.htm; Felitti, V.J., Anda, R.F., Nordenberg, D., Williamson, D.F., Spitz, A.M., Edwards, V., et. al. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) study. *American Journal of Preventive Medicine 14*(4): 245-258.
[91] US Department of Health and Human Services, Administration for Children and Families, Child Welfare Information Gateweay. (2008). *Long-term consequences of child abuse.* Retrieved from http://www.childwelfare.gov/pubs/factsheets/long_term_consequences.cfm
[92] Minnesota Department of Human Services. (2010). *Minnesota's child welfare report 2009: Report to the 2010 Minnesota Legislature*. Retrieved from https://edocs.dhs.state.mn.us/lfserver/Public/DHS-5408B-ENG

[93] Minnesota Department of Health, Center for Health Statistics. (2011). *Minnesota Student Survey*. Retrieved January 1 2012 from http://www.health.state.mn.us/divs/chs/mss/
[94] Minnesota Department of Health, Center for Health Statistics. (2011). *Minnesota Student Survey*. Retrieved January 1 2012 from http://www.health.state.mn.us/divs/chs/mss/
[95] Minnesota Department of Health, Center for Health Statistics. (2011).
[96] Minnesota Department of Health, Center for Health Statistics. (2011).
[97] Hoffman, S.D. (2006). *By the numbers: The public costs of adolescent childbearing*. The National Campaign to Prevent Teen and Unwanted Pregnancy. Retrieved from http://www.thenationalcampaign.org/resources/pdf/pubs/btn_full.pdf
[98] Center for Law and Social Policy. (2007). *Early start and teen parent families: Partnerships for success*. Retrieved from http://www.clasp.org/admin/site/publications_archive/files/0210.pdf
[99] Hennepin County. *2010 Survey of the Health of All the Population and the Environment (SHAPE).* Retrieved October 25 2012 from http://www.hennepin.us/SHAPE
[100] Largent, B. (2012, October 24). New data out on LGBT health. *Minnesota Daily*. Retrieved October 25 2012 from http://www.mndaily.com/2012/10/24/new-data-out-lgbt-health
[101] Minnesota Department of Health, Environmental Health Division. *Children's environmental health*. Retrieved January 1 2012 from http://www.health.state.mn.us/divs/eh/children/index.html
[102] Minnesota Department of Health, Center for Health Statistics. (2011). *Minnesota Student Survey*. Retrieved January 1 2012 from http://www.health.state.mn.us/divs/chs/mss/
[103] Centers for Disease Control and Prevention. (2011). *Behavioral Risk Factor Surveillance System*. Retrieved January 1 2012 from http://apps.nccd.cdc.gov/brfss/
[104] Minnesota Department of Health, Center for Health Statistics. (2011). *Minnesota Student Survey*. Retrieved January 1 2012 from http://www.health.state.mn.us/divs/chs/mss/
[105] US Department of Health and Human Services. (2008). *2008 physical activity guidelines for Americans.* Retrieved from http://www.health.gov/paguidelines/
[106] Minnesota Department of Health, Center for Health Statistics. (2011). *Minnesota Student Survey*. Retrieved January 1 2012 from http://www.health.state.mn.us/divs/chs/mss/
[107] Centers for Disease Control and Prevention. (2011). *Behavioral Risk Factor Surveillance System*. Retrieved January 1 2012 from http://apps.nccd.cdc.gov/brfss/
[108] Minnesota Department of Health, Chronic Disease Risk Reduction Unit. (2011). *Alcohol use in Minnesota*. Retrieved from http://www.health.state.mn.us/divs/hpcd/chp/cdrr/alcohol/alcpdf/AlcoholFactsheet.pdf
[109] Centers for Disease Control and Prevention. (2011). *Behavioral Risk Factor Surveillance System*. Retrieved January 1 2012 from http://apps.nccd.cdc.gov/brfss/
[110] Centers for Disease Control and Prevention. (2010). *Alcohol and public health: Binge drinking*. Retrieved January 1 2012 from http://www.cdc.gov/alcohol/fact-sheets/binge-drinking.htm
[111] Untied Health Foundation. (2011). *America's Health Rankings: Minnesota: Overview*. Retrieved January 1 2012 from www.americashealthrankings.org/MN
[112] Minnesota Department of Health, Center for Health Statistics. (2011). *Minnesota Student Survey*. Retrieved January 1 2012 from http://www.health.state.mn.us/divs/chs/mss/
[113] ClearWay Minnesota & Minnesota Department of Health. (2010). *Minnesota Adult Tobacco Survey*. Retrieved January 1 2012 from http://www.mnadulttobaccosurvey.org/.
[114] Centers for Disease Control and Prevention. (2011). *Behavioral Risk Factor Surveillance System*. Retrieved January 1 2012 from http://apps.nccd.cdc.gov/brfss/
[115] Minnesota Department of Health, Center for Health Statistics. (2011). *Minnesota Student Survey*. Retrieved January 1 2012 from http://www.health.state.mn.us/divs/chs/mss/
[116] ClearWay Minnesota. (2006). *The evidence is clear: Secondhand smoke is harmful.* Retrieved from http://www.clearwaymn.org/vertical/Sites/%7BF1680E9A-EF78-41E7-8793-6913CF57DBAB%7D/uploads/%7B87F82E6B-0A54-49E4-89C7-875CF007D0E9%7D.PDF
[117] Minnesota Department of Health. (2011). Minnesota Public Health Data Access: Environmental tobacco smoke (ETS). Retrieved April 2 2012 from https://apps.health.state.mn.us/mndata/ets
[118] ClearWay Minnesota & Minnesota Department of Health. (2010). *Minnesota Adult Tobacco Survey*. Retrieved January 1 2012 from http://www.mnadulttobaccosurvey.org/
[119] Minnesota Department of Health, Center for Health Statistics. (2011). *Teens and tobacco in Minnesota, 2011 update: Results from the Minnesota Youth Tobacco and Asthma Survey.* Retrieved from http://www.health.state.mn.us/divs/chs/tobacco/FullReport2011.pdf
[120] Centers for Disease Control and Prevention. (2011).

[121] U.S. Census Bureau. (2010). *American Community Survey.*
[122] U.S. Census Bureau. (2010). *American Community Survey.*
[123] U.S. Department of Health and Human Services, Health Resources and Services Administration. *National Survey of Children with Special Health Care Needs.* Retrieved February 24 2012 from http://mchb.hrsa.gov/cshcn05/
[124] Centers for Disease Control and Prevention. *National Survey of Children with Special Health Care Needs.* Retrieved February 24 2012 from http://www.cdc.gov/nchs/slaits/cshcn.htm
[125] Centers for Disease Control and Prevention. (2010). *State indicator report on physical activity*. Retrieved from http://www.cdc.gov/physicalactivity/downloads/PA_State_Indicator_Report_2010.pdf
[126] Minnesota Department of Health. (2010). *Diabetes and prediabetes in Minnesota*. Retrieved from http://www.health.state.mn.us/diabetes/pdf/FactSheet2010.pdf
[127] Centers for Disease Control and Prevention. (2010). *Behavioral Risk Factor Surveillance System*. Retrieved January 1 2012 from http://apps.nccd.cdc.gov/brfss/
[128] Minnesota Department of Health, School-Based Dental Sealant Program. *Sealant FAQs.* Retrieved February 24 2012 from http://www.health.state.mn.us/oralhealth/sealant.html; Centers for Disease Control and Prevention. *Dental sealants.* Retrieved February 24 2012 from http://www.cdc.gov/oralhealth/publications/factsheets/sealants_faq.htm
[129] Minnesota Department of Health, Oral Disease Prevention Unit. (2011). Third grade oral health basic screening survey. Retrieved from http://www.health.state.mn.us/oralhealth/pdfs/BSS2010factsheet.pdf
[130] Centers for Disease Control and Prevention. (2011). *Behavioral Risk Factor Surveillance System*. Retrieved January 1 2012 from http://apps.nccd.cdc.gov/brfss/
[131] Minnesota Dept. of Health, Minnesota Immunization Information Connection (MIIC). (2011). *Childhood immunization coverage in Minnesota.* Retrieved April 2 2012 from http://www.health.state.mn.us/divs/idepc/immunize/stats/coverdata.html
[132] Minnesota Department of Health, Center for Health Statistics. (2011). *Minnesota Student Survey*. Retrieved January 1 2012 from http://www.health.state.mn.us/divs/chs/mss/
[133] Centers for Disease Control and Prevention. (2010). *National Immunization Survey* [Data]. Retrieved April 2 2012 from http://www.cdc.gov/vaccines/stats-surv/nis/default.htm#nisteen
[134] Centers for Disease Control and Prevention. *Genital HPV infection: Fact sheet.* Retrieved April 2 2012 from http://www.cdc.gov/std/HPV/STDFact-HPV.htm
[135] Minnesota Department of Health, Center for Health Statistics. (2011). *Minnesota Student Survey*. Retrieved January 1 2012 from http://www.health.state.mn.us/divs/chs/mss/
[136] Allwood, P. (2005). *Handwashing among public restroom users at the Minnesota State Fair*. Minnesota Department of Health, Division of Environmental Health. Retrieved from http://www.health.state.mn.us/handhygiene/stats/fairstudy.pdf
[137] Minnesota Department of Public Safety, Office of Traffic Safety. *Seat belt law*. Retrieved January 22 2012 from https://dps.mn.gov/divisions/ots/laws/Pages/seat-belts.aspx
[138] Eby, D.W., Vivoda, J.M., & Cavanagh, J. (2011). *Minnesota safety belt and motorcycle helmet use*. Minnesota Department of Public Safety, Office of Traffic Safety. Retrieved January 1 2012 from https://dps.mn.gov/divisions/ots/reports-statistics/
[139] Minnesota Department of Public Safety. (2011).
[140] Eby, D.W., Vivoda, J.M., & Cavanagh, J. (2011). *Minnesota safety belt and motorcycle helmet use*. Minnesota Department of Public Safety, Office of Traffic Safety. Retrieved January 1 2012 from https://dps.mn.gov/divisions/ots/reports-statistics/
[141] Druss, B.G. & Reisinger, W.E. (2011). Mental disorders and medical comorbidity. *The Synthesis Project 21.* Retrieved from http://www.rwjf.org/pr/product.jsp?id=71883
[142] Minnesota Department of Health, Center for Health Statistics. (2011). *Minnesota Student Survey*. Retrieved January 1 2012 from http://www.health.state.mn.us/divs/chs/mss/
[143] Bernat, D. & Resnick, M. (2006). Healthy youth development: Science and strategies. *Journal of Public Health Management and Practice, 12*, S10-S16.
[144] Minnesota Department of Health, Center for Health Statistics. (2011). *Minnesota Student Survey*. Retrieved January 1 2012 from http://www.health.state.mn.us/divs/chs/mss/
[145] The Asset-Based Community Development Institute. Retrieved April 2 2012 from http://www.abcdinstitute.org/
[146] Minnesota's Future: An early childhood agenda for the youngest Minnesotans. Retrieved April 2 2012 from http://www.minnesotasfuture.net/
[147] Chicano Latino Affairs Council. Retrieved April 2 2012 from http://www.clac.state.mn.us/. Council on Black Minnesotans. Retrieved April 2 2012 from http://www.state.mn.us/portal/mn/jsp/home.do?agency=CBM. Council on Asian Pacific Minnesotans. Retrieved April 2 2012 from http://www.capm.state.mn.us/. Indian Affairs Council. Retrieved April 2 2012 from http://www.indianaffairs.state.mn.us/.
[148] Minnesota Board on Aging. Retrieved April 2 2012 from http://www.mnaging.org/
[149] Minnesota Alliance with Youth. *About us.* Retrieved April 2 2012 from http://mnyouth.net/about/

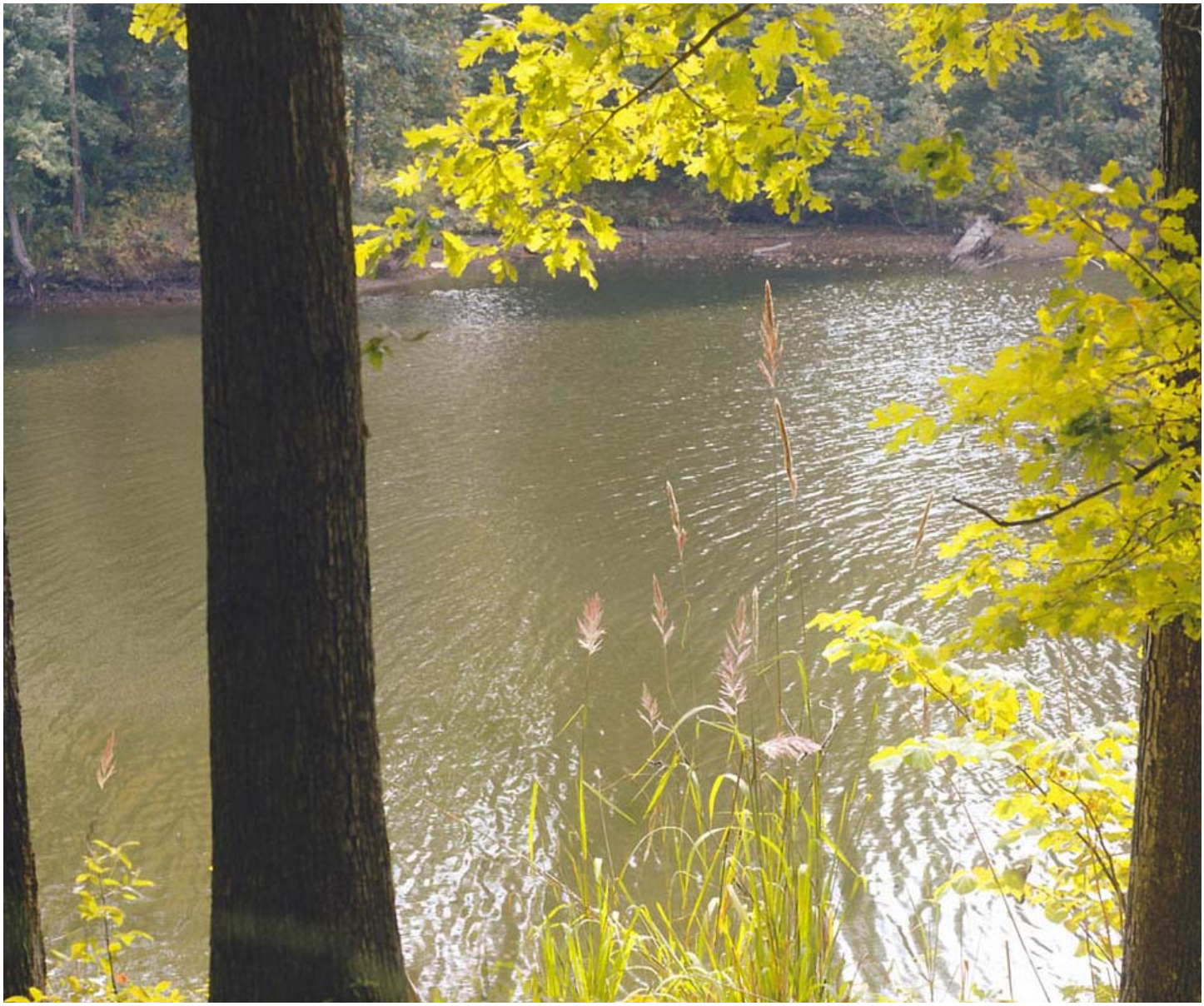
[150] Volunteering in America. Retrieved April 2 2012 from http://www.volunteeringinamerica.gov/
[151] Minnesota Department of Health, Office of Performance Improvement. *Strengthening Minnesota's public health system.* Retrieved April 2 2012 from http://www.health.state.mn.us/divs/cfh/ophp/system/index.html
[152] The McKnight Foundation. Retrieved April 2 2012 from http://www.mcknight.org/. Bush Foundation. *About the Bush Foundation.* Retrieved April 2 2012 from http://www.bushfoundation.org/about. The Saint Paul Foundation. Retrieved April 2 2012 from http://www.saintpaulfoundation.org/. Otto Bremer Foundation. Retrieved April 2 2012 from http://www.ottobremer.org/.
[153] Blue Cross and Blue Shield of Minnesota Foundation. Retrieved April 2 2012 from http://www.bcbsmnfoundation.org/. Target. *Community outreach.* Retrieved April 2 2012 from http://sites.target.com/site/en/company/page.jsp?contentId=WCMP04-031700. 3M. 3M community giving. Retrieved April 2 2012 from http://solutions.3m.com/wps/portal/3M/en_US/CommunityAffairs/CommunityGiving/. General Mills. *Communities*. Retrieved April 2 2012 from http://www.generalmills.com/responsibility/community_engagement.aspx.
[154] Minnesota Department of Transportation. *Hear every voice: Policy and goals.* Retrieved April 2 2012 from http://www.dot.state.mn.us/publicinvolvement/policy.html. Central Corridor Funders Collaborative. Retrieved April 2 2012 from http://www.funderscollaborative.org/.
[155] Minnesota Council of Churches. Retrieved April 2 2012 from http://www.mnchurches.org/. NECHAMA. Retrieved April 2 2012 from http://nechama.org/. Muslim American Society of Minnesota. *What is MASMN?* Retrieved April 2 2012 from http://www.masmn.org/8.html.
[156] Augsburg College: Center for Democracy and Citizenship. Retrieved April 2 2012 from http://www.augsburg.edu/democracy/index.html. Augsburg College. (2009). *Minnesota civic health index: Integrating civic engagement into community life.* Retrieved from http://www.augsburg.edu/democracy/documents/MN2009CHI_web.pdf. State Voices. *Minnesota Civic Engagement Table.* Retrieved April 2 2012 from http://www.statevoices.org/states/minnesota.
[157] Augsburg College. (2009). *Minnesota civic health index: Integrating civic engagement into community life.* Retrieved from http://www.augsburg.edu/democracy/documents/MN2009CHI_web.pdf
[158] Minnesota Department of Education. Retrieved April 2 2012 from http://education.state.mn.us/
[159] Minnesota Farmers' Market Association. Retrieved April 2 2012 from http://www.mfma.org/. Minnesota Department of Agriculture. *Minnesota grown.* Retrieved April 2 2012 from http://www3.mda.state.mn.us/mngrown/. Egerstrom, L. (2011). *Made in Minnesota 2011: Fertile ground for minority opportunity.* Minnesota 2020. Retrieved from http://www.mn2020.org/assets/uploads/article/Fertile_Ground_web.pdf.
[160] Mayo Clinic. Retrieved April 2 2012 from http://www.mayoclinic.org/. University of Minnesota Medical Center, Fairview. Retrieved April 2 2012 from http://www.uofmmedicalcenter.org/.
[161] Minneapolis St. Paul Regional Economic Development Partnership. (2011). *Industries and companies.* Retrieved April 2 2012 from http://www.greatermsp.org/industries-and-companies/industries-and-companies/
[162] Explore Minnesota Tourism. Retrieved April 2 2012 from http://www.exploreminnesota.com/. Minnesota Department of Natural Resources. *Minnesota state parks.* Retrieved April 2 2012 from http://www.dnr.state.mn.us/state_parks/index.html.
[163] Minnesota Department of Health. *Minnesota Electronic Disease Surveillance System.* Retrieved April 2 2012 from http://www.health.state.mn.us/divs/istm/medss/index.html. Minnesota Department of Health. *Emergency preparedness, response, and recovery.* Retrieved April 2 2012 from http://www.health.state.mn.us/macros/topics/emergency.html. Minnesota Department of Public Safety. *Homeland security and emergency management.* Retrieved April 2 2012 from https://dps.mn.gov/divisions/hsem/Pages/default.aspx
[164] Minnesota Department of Health. *Eliminating Health Disparities Initiative (EHDI).* Retrieved April 2 2012 from http://www.health.state.mn.us/ommh/grants/ehdi/index.html
[165] Minnesota Department of Health. *Statewide Health Improvement Program.* Retrieved April 2 2012 from http://www.health.state.mn.us/divs/oshii/ship/index.html
[166] The Itasca Project. *About the Itasca Project.* Retrieved April 2 2012 from http://www.theitascaproject.com/overview.htm
[167] Minnesota Public Health Research to Action Network. Retrieved April 2 2012 from http://www.health.state.mn.us/divs/cfh/ophp/system/ran/
[168] Minnesota Department of Human Services. *Children's Mental Health and Family Services Collaboratives.* Retrieved April 2 2012 from http://www.dhs.state.mn.us/main/id_001475. Minnesota Department of Health. *The QI Collaborative: Minnesota Public Health Collaborative for Quality Improvement.* Retrieved April 2 2012 from http://www.health.state.mn.us/divs/cfh/ophp/consultation/mlc2/index.html.
[169] Land Stewardship Project. Retrieved April 2 2012 from http://www.landstewardshipproject.org/
[170] Minnesota Pollution Control Agency. *Minnesota Sustainable Communities Network.* Retrieved April 2 20o12 from http://www.pca.state.mn.us/index.php/topics/preventing-waste-and-pollution/sustainability/sustainable-communities/minnesota-sustainable-communities-network.html

The Health of Minnesota

Statewide Health Assessment : Part Two

May 2012

Chronic Diseases and Conditions • Infectious Disease • Injury and Violence



Minnesota Department of Health &
Healthy Minnesota Partnership
PO Box 64975 | 625 Robert Street N
Saint Paul, MN 55164-0975
Phone: (651) 201-5000
www.health.state.mn.us/healthymnpartnership

The Health of Minnesota

Statewide Health Assessment, Part Two: Disease and Injury — May 2012

For the electronic version of this document and for ***Part One*** of the Statewide Health Assessment, visit the Minnesota Department of Health website: www.health.state.mn.us/statewidehealthassessment. ***The Health of Minnesota: Statewide Health Assessment*** was produced in collaboration by the Minnesota Department of Health and the Healthy Minnesota Partnership.

Minnesota Department of Health and Healthy Minnesota Partnership
PO Box 64975 | 625 Robert Street N | Saint Paul, MN 55164-0975
Phone: (651) 201-5000 | Online: www.health.state.mn.us/healthymnpartnership

Introduction

A statewide health assessment provides an overview of a state's population characteristics, social and economic factors, and health outcomes. The purpose of a statewide health assessment is to collect and analyze data in a way that educates and mobilizes communities to develop health priorities, leverage resources, and plan actions to improve population health. This is accomplished through the systematic collection and analysis of data from a wide range of sources to provide a thorough basis for decision-making, and with the active involvement of partners throughout each step.

The two parts of Minnesota's statewide health assessment present a wide array of indicators and information about statewide influences on health as well as individual indicators of health behaviors and health status:

> ***The Health of Minnesota: Statewide Health Assessment, Part One*** examines the conditions and factors in Minnesota that *create health* and provide people in Minnesota with the opportunity to be healthy. These factors include the environment, education, employment, and much more. ***Part One*** also looks at individual behaviors like smoking, use of alcohol, and physical activity, which also have an impact on health.
>
> ***The Health of Minnesota: Statewide Health Assessment, Part Two*** looks at the *lack of health*, in the form of rates of death and disability from disease and injury.

The two documents complement each other: without the opportunity to be healthy or the conditions and behaviors that create health, people in Minnesota suffer from many negative health outcomes.

The Healthy Minnesota Partnership

Minnesota's statewide health assessment was prepared under the auspices of the Healthy Minnesota Partnership, a multi-sector group of community leaders.* The Partnership is charged with developing innovative public health priorities, goals, objectives and strategies to improve the health of all Minnesotans, and to ensure ownership of these priorities and strategies in communities across the state. ***The Health of Minnesota*** is the first step toward fulfilling this charge, and provides the basis for creating a ***Healthy Minnesota 2020*** statewide health plan. The Partnership hopes that assessing and addressing a broad array of health-related conditions and factors will change the conversation around health, energize the public, private and nonprofit sectors, and create a groundswell of community efforts to improve health in every Minnesota community.

For information on the public input process, the statewide health assessment framework, and limitations of the assessment, please refer to ***The Health of Minnesota: Statewide Health Assessment, Part One***.

---

* *Partners range from state agencies to communities of color, local public health, elected officials, nonprofits, health care providers and the community. For a list of Partnership members, please visit http://www.health.state.mn.us/healthymnpartnership*

Leading Causes of Death in Minnesota

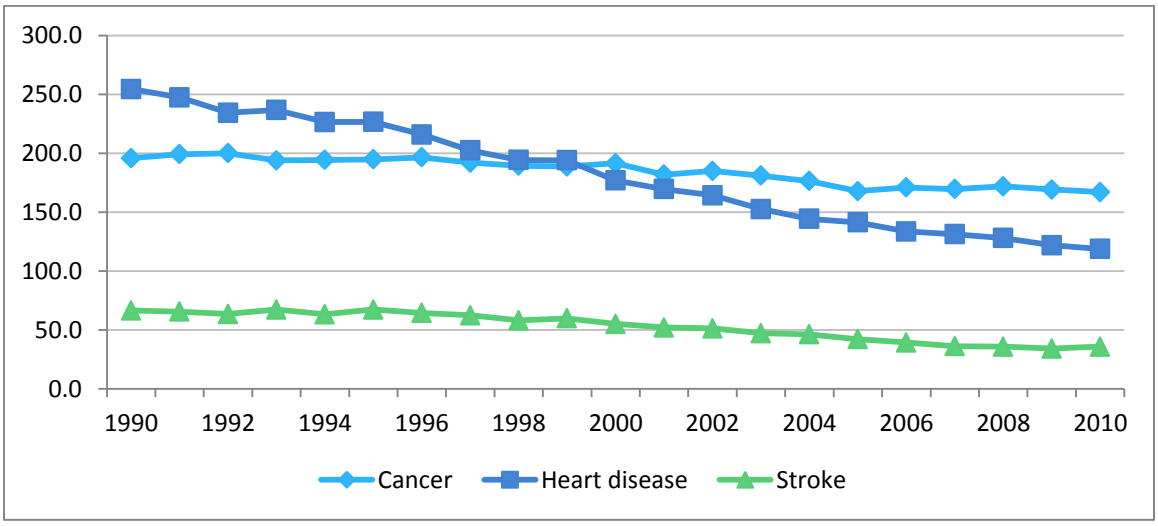
Cancer, heart disease, and stroke are the leading causes of death in Minnesota, although the mortality rate for all three diseases has declined over the past ten years. These three diseases have been the leading causes of death in Minnesota for decades; in 2000, cancer eclipsed heart disease as the leading cause of death in Minnesota.[1]

Leading causes of death in Minnesota: 2010

Cause of Death	Count	Age-Adjusted Rate *
Cancer	9,599	166.9
Heart Disease	7,144	118.7
Unintentional Injury	2,087	36.4
Stroke	2,154	35.8
Chronic Lower Respiratory Disease	2,012	35.1
Alzheimer's Disease	1,450	23.4
Diabetes	1,036	17.7
Nephritis	895	15.0
Suicide	599	11.1
Pneumonia and Influenza	591	9.7
Cirrhosis	412	7.0
Septicemia	337	5.8
Congenital Anomalies	190	3.6
Perinatal Conditions	140	2.7
Homicide	111	2.1

** Rate per 100,000. Source: Minnesota Department of Health, Center for Health Statistics. (2012).*[2]

Leading causes of death in Minnesota: 1990-2010



Age-adjusted rate per 100,000. Source: Minnesota Dept. of Health, Center for Health Statistics. (2012).[3]

Chronic Diseases and Conditions

Chronic diseases and conditions persist over a long period of time, over months and years, andes are among the leading causes of death and years of potential life lost in Minnesota. Chronic disease and conditions also significantly contribute to long-term disability and poor quality of life.[4]

Alzheimer's Disease

Alzheimer's disease is the most common form of dementia among older adults. It affects a person's ability to think, remember, and make decisions. Adults younger than 65 may get Alzheimer's disease, but it is much less common than among adults over 65; the risk for developing Alzheimer's in any population goes up with age, doubling every five years beyond age 65. About 5 percent of men and women ages 65 to 74 have Alzheimer's disease, and it is estimated that nearly half of those age 85 and older may have the disease. About 94,000 Minnesotans are estimated to have Alzheimer's disease.[5]

Arthritis

Arthritis is not a single disease, but instead signifies a group of over 100 medical conditions that primary affect the musculoskeletal system, and specifically the joints. Arthritis commonly occurs with other chronic conditions, such as diabetes, heart disease, and obesity. Arthritis affects all age groups, but the likelihood of occurrence increases with age.[6]

Arthritis is a major cause of disability in Minnesota and the U.S., and the third leading cause of work limitation.[7] In 2009, 21 percent of all Minnesotans had been told that they had arthritis, while 45 percent of Minnesotans over age 65 had been told they have arthritis. The proportion of individuals with arthritis decreases with income: nearly 34 percent of Minnesotans with incomes under $15,000 had even been told they had arthritis, compared to just 16 percent of Minnesotans with incomes over $50,000.

Minnesotans with arthritis: 2009

Yearly Income	With Arthritis	Without Arthritis
Less than $15,000	33.6 %	66.4 %
$15,000 - $24,999	29.6 %	70.4 %
$25,000 - $34,999	24.8 %	75.2 %
$35,000 - $49,999	27.5 %	72.5 %
$50,000 and above	15.7 %	84.3 %

Source: Centers for Disease Control and Prevention. (2010). [8]

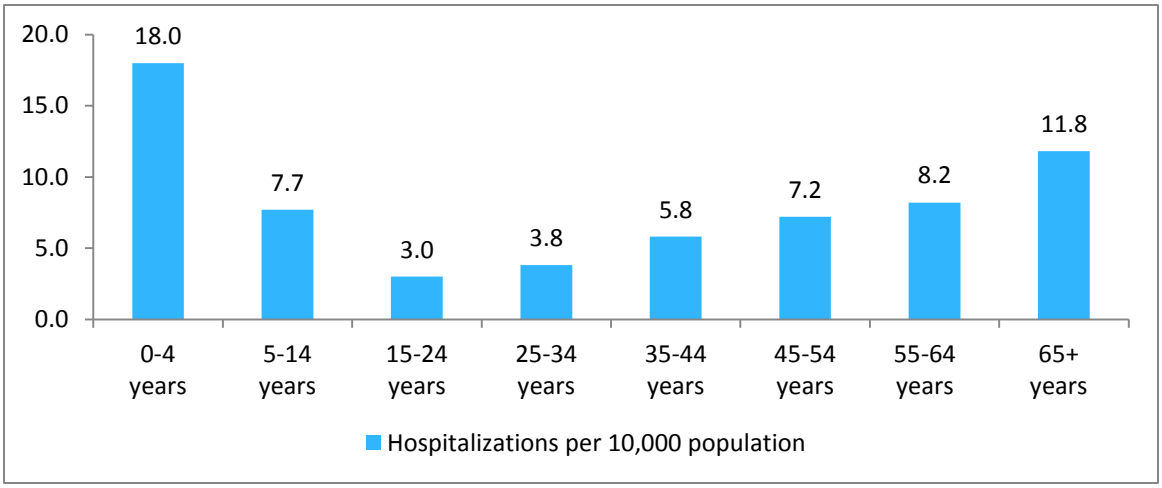
Asthma

Asthma is a chronic respiratory disease affecting the lungs and bronchial tubes. Approximately 392,000 Minnesotans currently have asthma, including about 90,000 children.[9]

The majority of problems associated with asthma are preventable, including hospitalization. Asthma attacks can be triggered by viral infections, pollen, dust mites, secondhand smoke, mold, air pollution, and stress. Asthma prevention includes control of exposure to factors that trigger exacerbation, appropriate medication use, continual monitoring of the disease, and patient education in asthma care. Hospitalizations due to asthma are an indicator both of the severity of the disease and of barriers to regular asthma care (e.g., lack of health insurance).

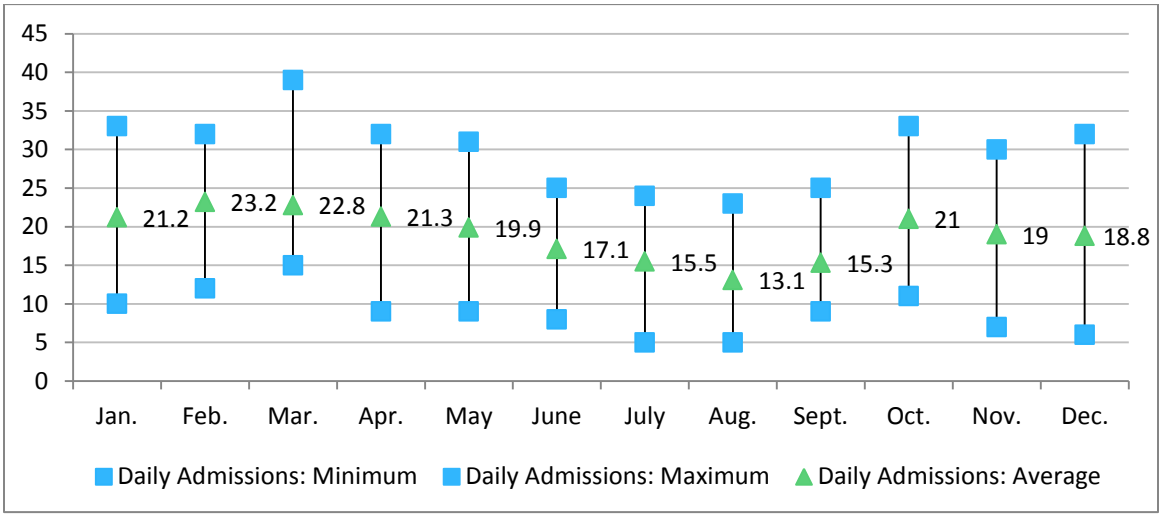
Asthma hospitalizations in Minnesota: 2009

Minnesota's youngest children are hospitalized for asthma at a higher rate than other age groups.



Source: Minnesota Department of Health. (2011).[10]

Daily asthma hospitalizations Minnesota: 2009



Source: Minnesota Department of Health, Health Promotion and Chronic Disease Division. (2012).[11]

Cancer

Cancer is currently the leading cause of death in Minnesota. The American Cancer Society estimates that there were over 25,000 new cases of cancer in 2010 and 9,200 deaths. About half of Minnesota's men and 40 percent of the state's women will be diagnosed with a potentially

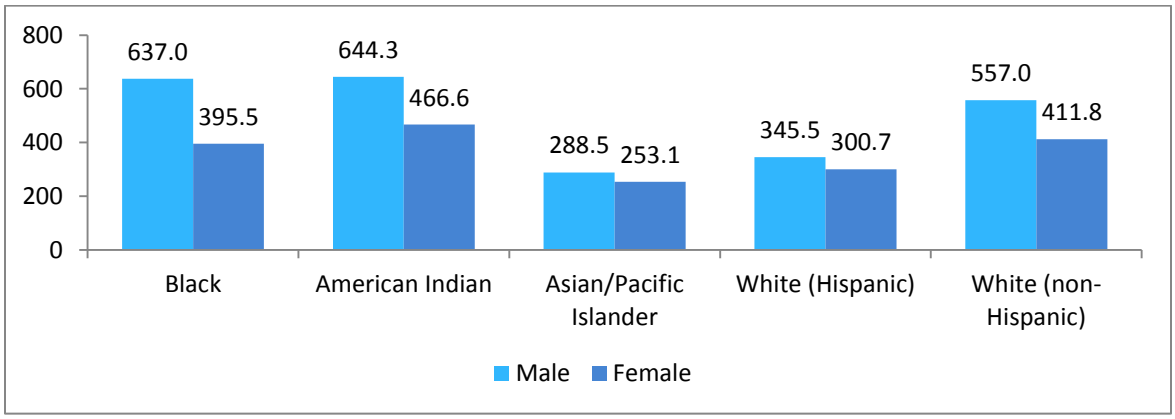
serious form of cancer during their lifetimes. The lifetime risk of developing cancer is somewhat higher in Minnesota because life expectancy in the state is higher, and therefore more people live to develop cancer. The most commonly diagnosed cancers in Minnesota include lung cancer, colorectal, breast and prostate cancer.[12]

According to the American Cancer Society, the risk of death from cancer is influenced by poverty more than by race.[13] People in poverty are more likely to smoke and to be obese, two major risk factors for cancer. In addition, poverty may expose people to unhealthy environments, limit awareness of health promotion messages and access to cancer screening, and lead to seeking medical care at a later stage of illness, when treatment options are limited and the potential for death is much higher.

In Minnesota, overall cancer incidence and mortality are highest among American Indians and African-Americans, and lowest among Hispanic and Asian-Pacific Islander populations.[14] Race- and ethnicity-specific cancer rates in Minnesota are very similar to national rates, save for among American Indians—among American Indians in Minnesota, cancer incidence and mortality is twice as high as in the rest of the U.S. Despite higher poverty rates among Hispanics and Asian-Pacific Islanders, their cancer rates tend to be considerably lower than among non-Hispanic whites. However, their risk for stomach and liver cancers, two of the most deadly cancers, are considerably higher.[15]

Cancer and cancer-related mortality in Minnesota both occur at rates similar to those in the rest of the U.S. However, the disparity in both measures between the state's white and American Indian populations is twice as high as that in the rest of the U.S.

Cancer* in Minnesota: 1999-2008



** Incidence calculated for all types of cancer combined. Source: Minnesota Department of Health (2011).*[16]

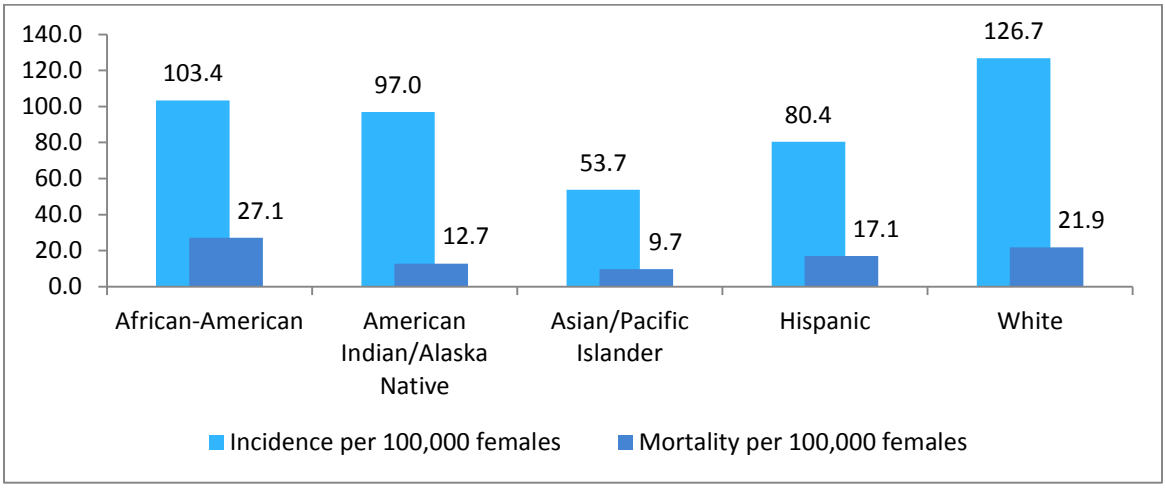
Breast Cancer

Breast cancer is the most common form of cancer and the second leading cause of cancer deaths among Minnesota women. Surviving breast cancer is directly related to the stage of the disease at the time of diagnosis.[17] African-American and Hispanic women in Minnesota are more likely to be diagnosed with later-stage breast cancer.

As in the rest of the U.S., Minnesota's women of color are slightly less likely than white women to be diagnosed with breast cancer, but African-American women are at the greatest risk of dying from the disease. In fact, breast cancer mortality among African-American women is 24 percent higher than white women, despite the incidence of breast cancer among African-American women being 18 percent lower.[18] This population's higher rate of mortality can clearly be partially attributed to later stage diagnosis.[19]

Breast cancer in Minnesota women: 2003-2007

Breast cancer mortality is highest in the state's African-American population.

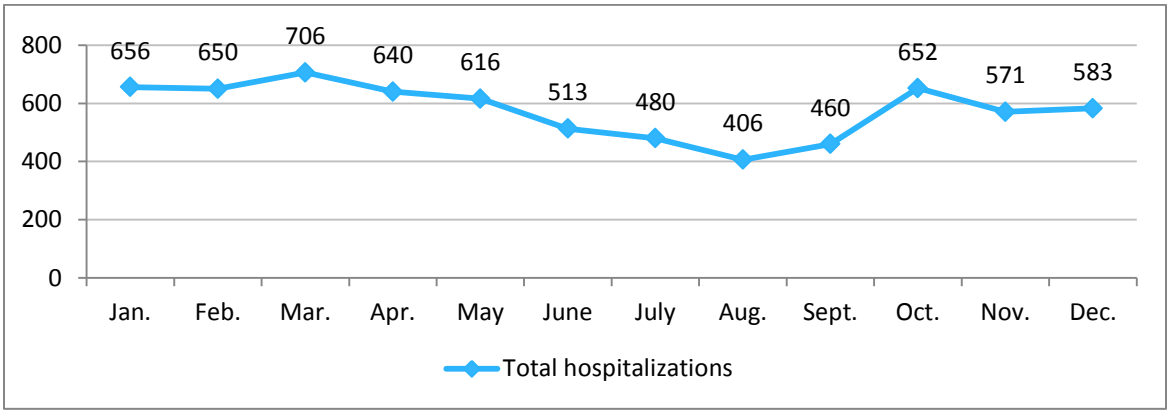


Source: American Cancer Society. (2011).[20]

Chronic Obstructive Pulmonary Disease

Chronic obstructive pulmonary disease, or COPD, is a group of slowly progressive lung diseases (such as emphysema and chronic bronchitis) characterized by obstruction to air flow that interferes with normal breathing. The most common cause of COPD is exposure to tobacco smoke, but not all smokers develop COPD. In Minnesota in 2009, 1,771 people died from COPD;[21] nearly all deaths from COPD occur among adults age 25 and older. While COPD is preventable and treatable, the effects of COPD are not fully reversible.

COPD hospitalizations in Minnesota: 2009



Source: Minnesota Department of Health, Health Promotion and Chronic Disease Division. (2012).[22]

COPD may be exacerbated by certain environmental exposures, such as smoke, dust mites and mold, and dirty furnace air filters. Because of sensitivity to these environmental factors, hospitalization for COPD varies by time of year. Admissions are highest during the fall and winter months, when people are indoors, and lower in the summer.

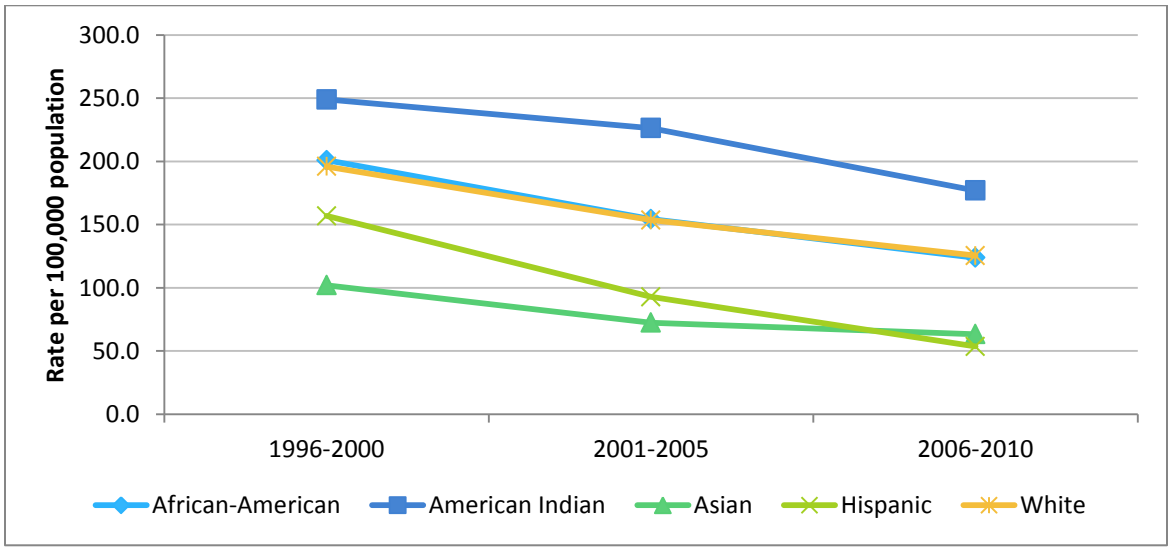
Heart Disease and Stroke

Heart Disease

Heart disease currently is the second leading cause of death in Minnesota. Minnesota consistently has one of the lowest rates of heart disease mortality in the nation—about 30 percent lower than the national average.

Between 1996 and 2010 the mortality rate for heart disease declined in all race/ethnicity groups, for both men and women. Heart disease death rates are higher in men than in women, for all racial and ethnic groups.

Heart disease-related death in Minnesota: 1996-2010



Disparities in rates of heart disease persist in Minnesota, despite the fact that overall rates have fallen across all races and ethnicities in the state.

	1996-2000	2001-2005	2006-2010
African-American	200.9	154.3	123.8
American Indian	248.9	226.3	177.0
Asian	102.0	72.4	63.3
Hispanic	156.9	92.8	53.6
White	195.9	153.5	125.5

Source: Minnesota Department of Health, Heart Disease and Stroke Prevention Unit. (2011).[23]

As with cancer, heart disease mortality rates differ between races and ethnicities—most notably, American Indians have a much higher rate of heart disease-related mortality than other races and ethnic groups in the state. Heart disease rates also vary by geography; Minnesota's rural residents experience higher rates of heart disease-related mortality.

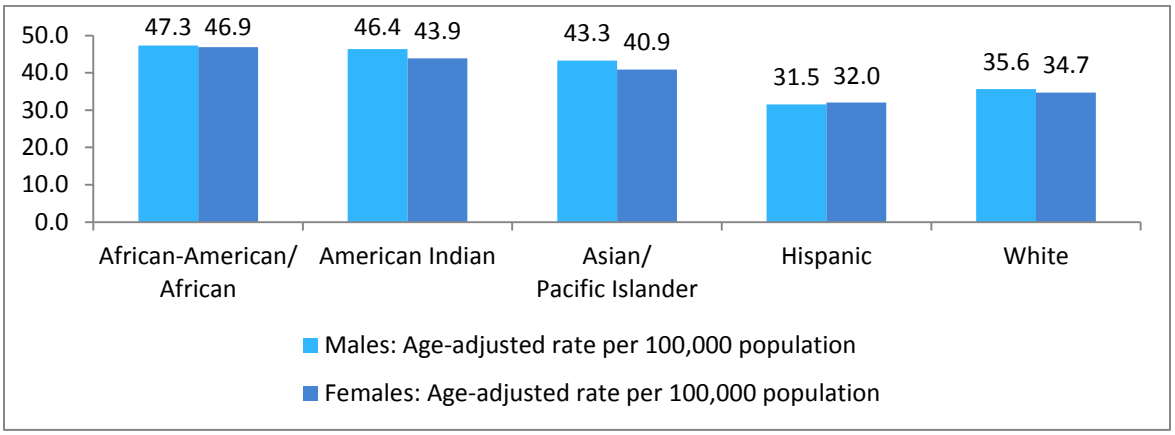
Stroke

Stroke is a major cause of death in Minnesota. In 2010, approximately 1.9 percent of adults in the state reported ever having had a stroke in their lifetime—a total of over 75,000 people. [24]

Stroke kills more women than men, and is disproportionately fatal for individuals over the age of 75. Compared to the non-Hispanic white population, mortality due to stroke is significantly higher for the African-American, American Indian and Asian populations in Minnesota. As with heart disease, stroke mortality rates are higher in the rural areas of Minnesota.

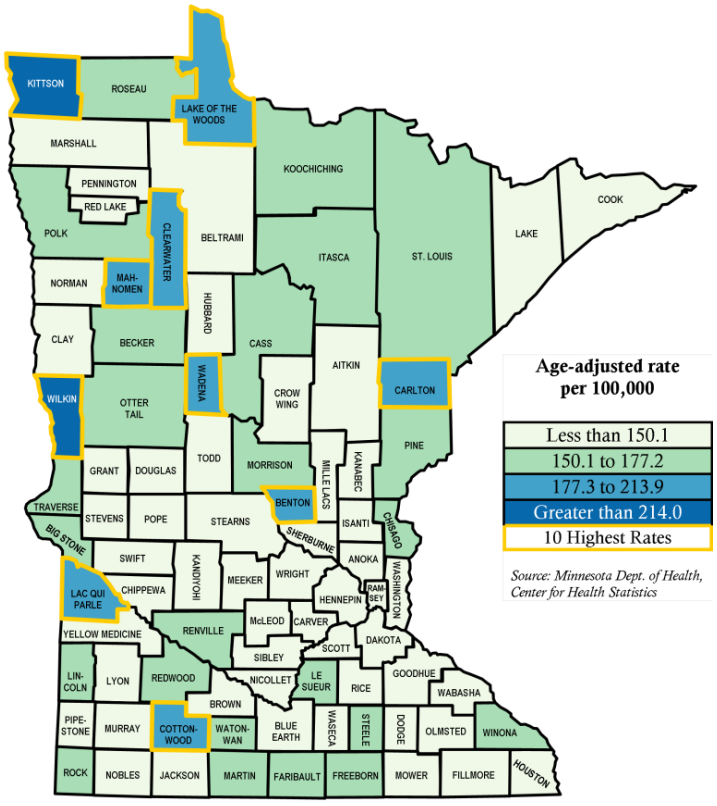
Stroke death in Minnesota: 2006-2010

Minnesota's African-American, American Indian, and Asian populations have the highest rates of stroke-related mortality.

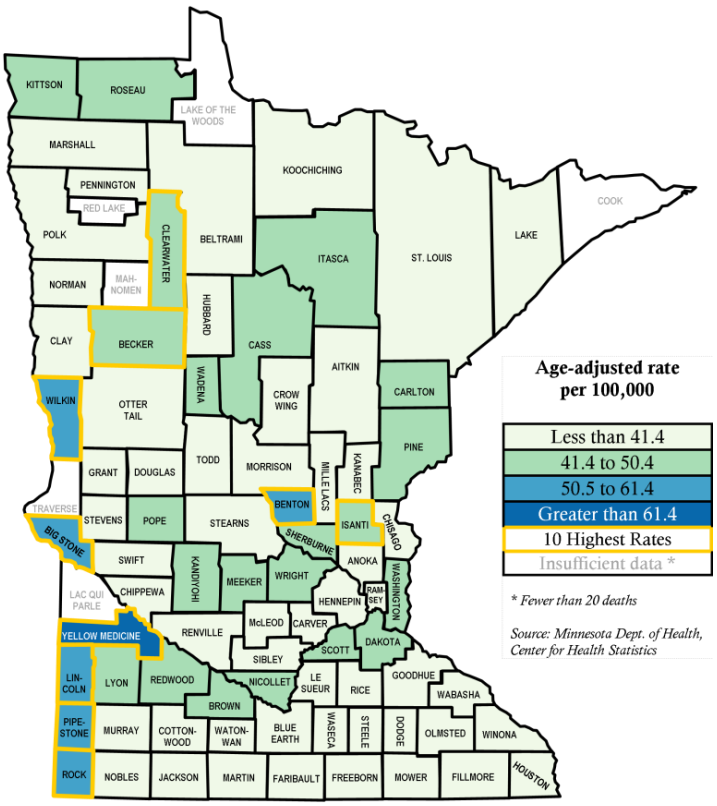


Source: Minnesota Department of Health, Center for Health Statistics. (2011).[25]

Heart disease mortality in Minnesota: 2005-2009



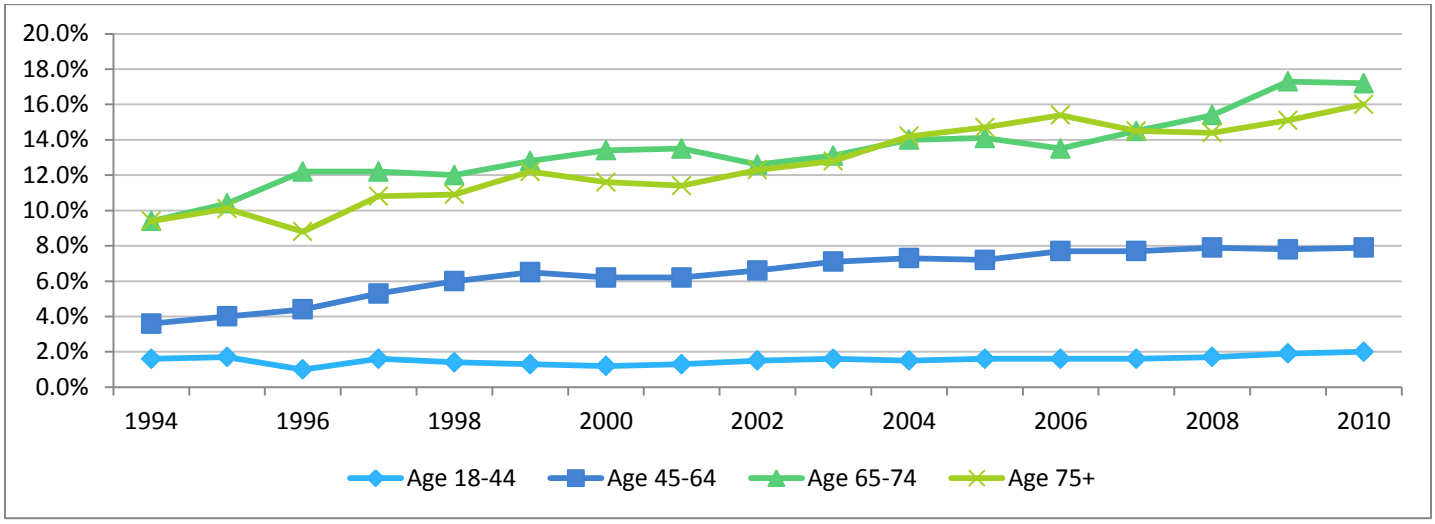
Stroke mortality in Minnesota: 2005-2009



Diabetes

Diabetes is a leading cause of death in Minnesota, and is on the rise. It is the leading cause of blindness in adult Minnesotans, the leading cause of chronic kidney disease among the same group, and the leading complication among mothers giving birth in the state. Diabetes limits daily activities, increases the incidence of heart disease and stroke, and contributes to depression.[26]

Minnesotans with diabetes: 1994-2010



	1994	1996	1998	2000	2002	2004	2006	2008	2010
Age 18-44	1.6%	1.0%	1.4%	1.2%	1.5%	1.5%	1.6%	1.7%	2.0%
Age 45-64	3.6%	4.4%	6.0%	6.2%	6.6%	7.3%	7.7%	7.9%	7.9%
Age 65-74	9.4%	12.2%	12.0%	13.4%	12.6%	14.0%	13.5%	15.4%	17.2%
Age 75+	9.4%	8.8%	10.9%	11.6%	12.3%	14.2%	15.4%	14.4%	16.0%

Source: Centers for Disease Control and Prevention (CDC). (2011).[27]

Obesity and being overweight are the primary risk factors for diabetes. The growing burden of diabetes affects everyone in Minnesota, but disproportionately affects people of color and American Indians. The death rate from diabetes is nearly five times as high for the American Indian population in Minnesota as for the state's white population. [28]

Mental Illness

Serious mental illness, such as schizophrenia, schizoaffective disorder, and bipolar affective disorder, can significantly increase mortality. Individuals with serious mental illness die an average of 25 years earlier than those without.[29] This holds true in Minnesota, as well: a study of Minnesotans receiving services through Minnesota Health Care Programs found that Minnesotans with serious mental illness do not live past an average age of 58, while those without mental illness live to an average age of 82.[30]

On average, Minnesotans with serious mental illness do not live past 58, while those without mental illness live to 82.

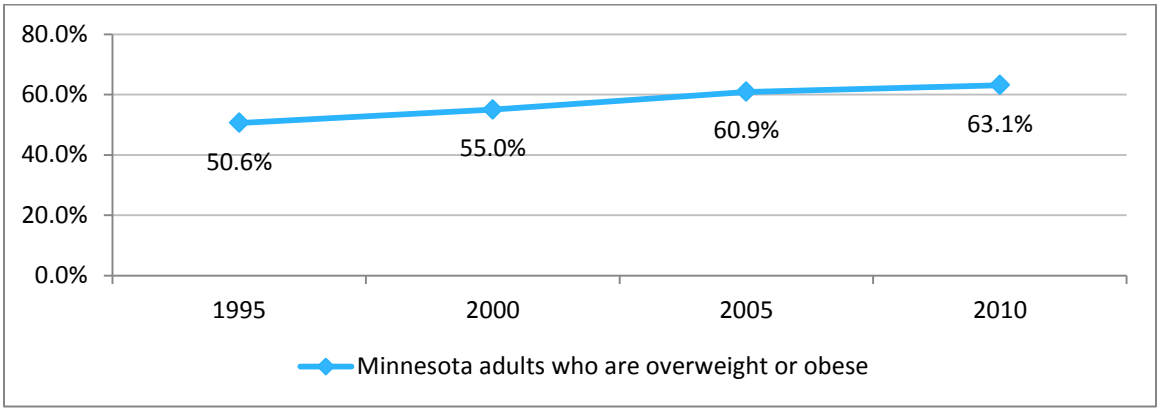
Serious mental illness has other important influences on health: individuals with serious mental illnesses are more likely to experience homelessness, uninsurance, and a lack of social support. The difficulty of changing behaviors such as smoking or alcohol use in persons with serious mental illnesses is compounded by their mental status and these life circumstances. Over 8 percent of Minnesota's adult population—or about 350,000 Minnesotans—experienced significant depressive symptoms in 2011; and 3 percent (about 125,000) had symptoms of suggestive of serious psychological distress (although these groups are not mutually exclusive).[31]

Obesity

The rate of obesity continues to rise in every racial and ethnic population in Minnesota, as well as among children, adolescents, and adults, and among both males and females. Minnesota is neither the most obese state in the nation nor is it the slimmest. Minnesota is ranked the 32nd most obese state in the nation.[32]

Minnesota adults who are overweight or obese: 1995-2010

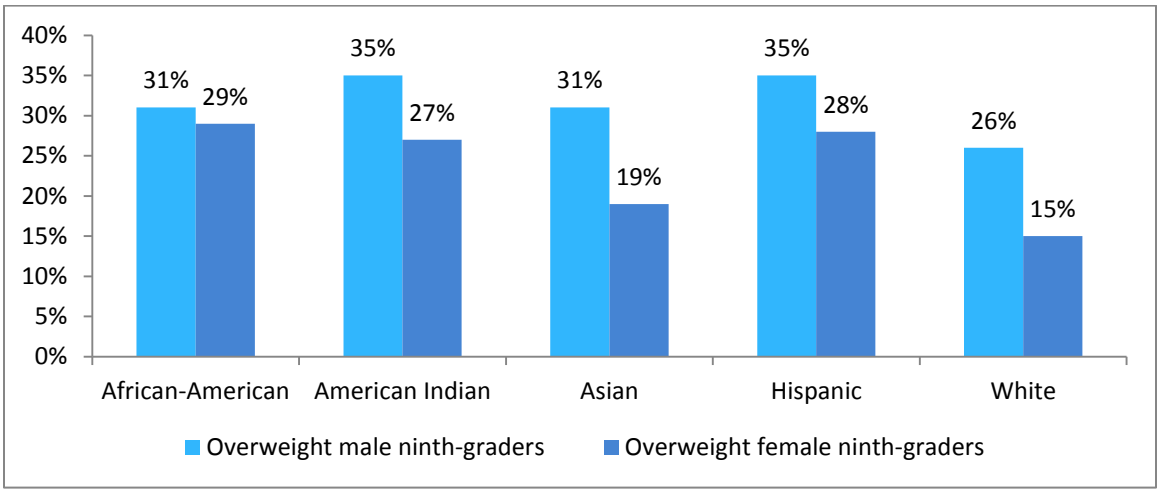
Minnesotans have grown increasingly overweight and obese over the past 15 years.



Source: Centers for Disease Control and Prevention. (2011).[33]

Minnesota ninth-graders who are overweight or obese: 2010*

Teen boys in Minnesota are more likely to be overweight and obese than teen girls.



** Based on self-reported height and weight. Source: Minnesota Department of Health, Center for Health Statistics. (2011).*[34]

Obesity puts people at much greater risk for the development and early onset of a wide variety of chronic diseases and health conditions, including hypertension, diabetes, coronary heart disease and stroke, gallbladder disease, depression, osteoarthritis, sleep apnea, and some cancers.[35] Obesity often has social consequences, as well: children and adolescents who are overweight or obese may be teased or ostracized, and obese adults can face discrimination in the workplace.

Because of its link to so many serious health conditions, obesity significantly raises health care costs. According to a recently published study, in 2009 Minnesota paid an estimated $2.8 billion in state funds for obesity-related Medical Assistance (Medicaid) and Medicare costs. The report estimated that expenditures for these programs would be about 9 percent lower if all obese Minnesotans were normal weight.[36]

Minnesota children aged two to five enrolled in WIC* who are overweight or obese: 2009

Race/Ethnicity	Overweight (85th to 94th percentile)	Obese (95th percentile and above)
White, non-Hispanic	16.0	10.0
Black, non-Hispanic	14.7	12.0
Hispanic	18.2	17.7
American Indian	23.2	27.7
Asian and Pacific Islander	17.0	15.8
Multiple Races	18.5	13.1

** WIC is the Special Supplemental Nutrition Program for Women, Infants, and Children, administered by the U.S. federal government. Source: Centers for Disease Control and Prevention. (2009).*[37]

Infectious Disease

Infectious diseases are a significant cause of illness, disability, and death in Minnesota. Infectious diseases are illnesses caused by organisms such as bacteria, viruses, fungi, or parasites. Some infectious diseases can be passed from person to person, some are transmitted via bites from insects or animals, and others are acquired by ingesting contaminated food or water or other exposures in the environment.

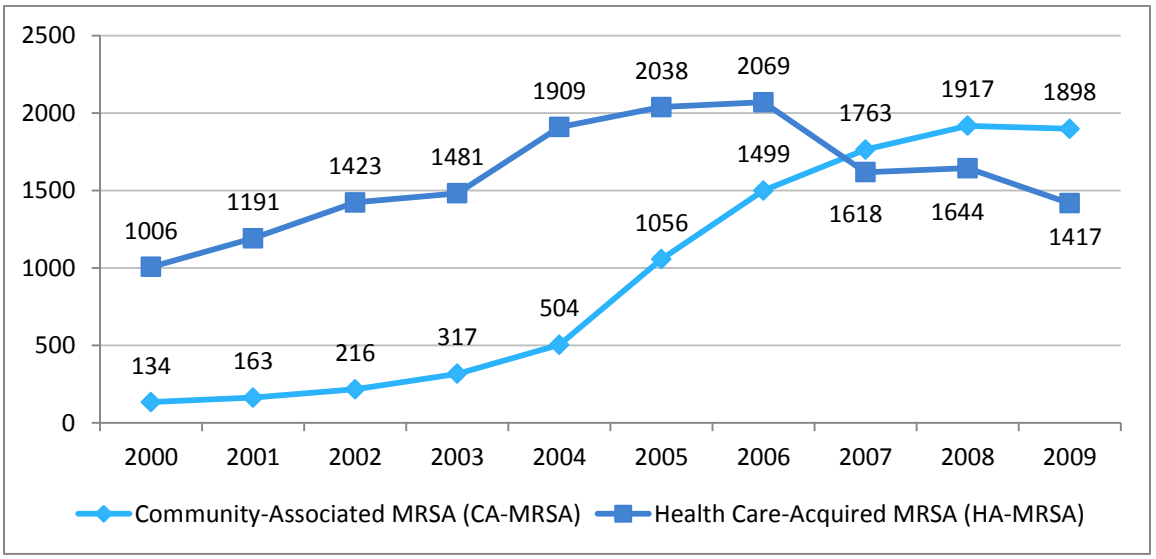
Antibiotic-Resistant Infections

Antibiotics are powerful medicines developed to inhibit the growth and reproduction of bacteria, which makes them critical in combatting bacterial infections. The first antibiotic was introduced in the 1940s, and more than 100 different antibiotics are available today to cure a variety of infections from skin infections to life-threatening blood infections. However, the overuse and inappropriate use of antibiotics have led to antibiotic-resistant infections, which threatens to make many infections untreatable.

Bacteria that develop resistance against more than one antibiotic are called multidrug-resistant bacteria. Infections caused by these bacteria include extremely drug resistant tuberculosis (XDR-TB) and carbepenem-resistant *Enterobacteriaceae*, both of which are resistant to nearly all currently available antibiotics.

Reported MRSA cases in Minnesota: 2000-2009 *

The number of community-associated MRSA infections (CA-MRSA) in Minnesota has increased at a rapid rate since 2000.



** Reported at 12 sentinel sites. Source: Minnesota Department of Health, Emerging Infections Unit. (2012).*[38]

One particular infection is caused by *Staphylococcus aureus* (more commonly known as "staph"). Strains of *S. aureus* that are multidrug resistant are referred to as *methicillin-resistant S. aureus* (or MRSA). There are two main types of MRSA. The first type is referred to as healthcare-associated MRSA (HA-MRSA) that is associated with people who have been hospitalized, had surgery, lived in a nursing home, or had an indwelling device in the year before the infection. The second

type is referred to as community-associated MRSA (CA-MRSA) where the infection develops in healthy, younger people who do not have those traditional healthcare-associated risk factors, but have likely acquired the disease in a community, recreational, or educational setting.

Monitoring of the number of MRSA infections reported from 12 sentinel sites across the state revealed a substantial increase in the number of CA-MRSA infections between 2000 and 2009, and a decrease in the number of HA-MRSA infections during the same time period.

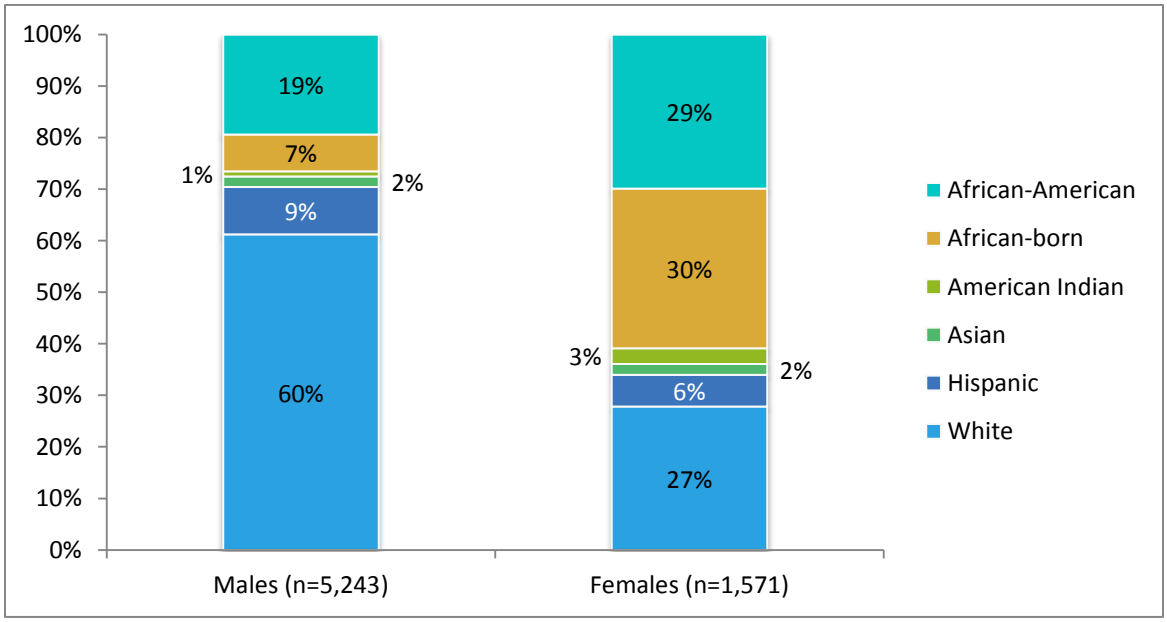
HIV and AIDS

The number of persons assumed to be living with HIV (human immunodeficiency virus) and AIDS (acquired immune deficiency syndrome) in Minnesota has been steadily increasing during the past 30 years. As of 2010, almost 7,000 persons were known to be living with HIV/AIDS in Minnesota, a 4 percent increase from the year prior.

Both the number of newly-diagnosed AIDS cases and the number of deaths among AIDS cases declined between 1996 and 2000. These decreases were primarily due to the success of new treatments introduced in 1995 (protease inhibitors) and 1996 (highly active antiretroviral therapy). These treatments do not cure AIDS, but can delay progression of the disease and improve survival.

Three-fourths of the cases of HIV/AIDS in Minnesota occur among males. Of those diagnosed with HIV/AIDS, nearly two-thirds are white. Only about one-fourth of Minnesota women with HIV/AIDS, however, are white; nearly 30 percent are African-American and 30 percent are African-born.

Minnesotans living with HIV/AIDS: 2010



Two-thirds of Minnesota men living with HIV/AIDS are white, while two-thirds of Minnesota women living with HIV/AIDS are African-American or African-born.

Source: Minnesota Department of Health, Infectious Disease Epidemiology, Prevention and Control Division. (2010).[39]

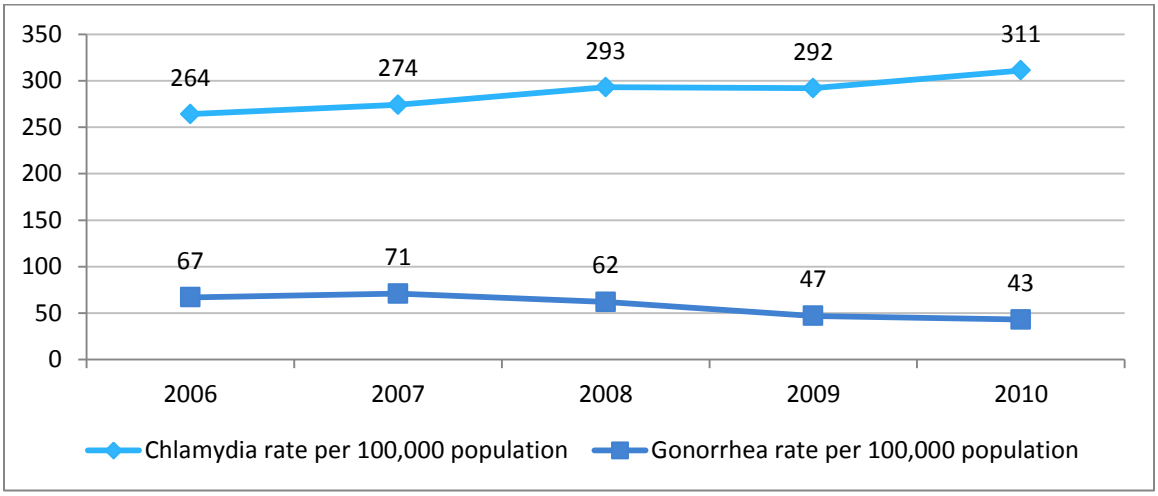
Sexually Transmitted Infections

Sexually transmitted infections (STIs), also known as sexually transmitted diseases, are the most commonly reported communicable diseases in Minnesota, and account for nearly 70 percent of all notifiable diseases reported to the Minnesota Department of Health. In 2010, the number of reported bacterial STIs increased to nearly 18,000 cases, a 5 percent increase from the previous year. The majority of those (over 15,000) are cases of chlamydia. Since 1996, the rates of chlamydia in Minnesota have more than doubled. Changes in STI incidence varied by disease, with chlamydia increasing by 6 percent, primary/secondary syphilis increasing by 110 percent and gonorrhea decreasing by 9 percent.

Youth and young adults between 15 and 24 are much more likely to contract both chlamydia and gonorrhea: they comprise 69 percent of all chlamydia cases and 65 percent of all gonorrhea cases reported in 2010. Three-fourths of these cases are young women.

Sexually transmitted infections in Minnesota: 2006-2010

Rates of chlamydia continue to climb in Minnesota.



Source: Minnesota Dept. of Health, Infectious Disease Epidemiology, Prevention and Control Division. (2011).[40]

Significant disparities exist in the incidence of STIs among racial/ethnic groups in Minnesota. The state's African-American population is almost 15 times more likely to have chlamydia than Minnesota's white population. Other populations of color in Minnesota are three to five times more likely to have chlamydia than the state's white population. The rate of gonorrhea among the state's African-American population is 34 times higher than that of the state's white population, and rates of syphilis have also disproportionately increased among African-American's in the state, at almost five times that of the white population.

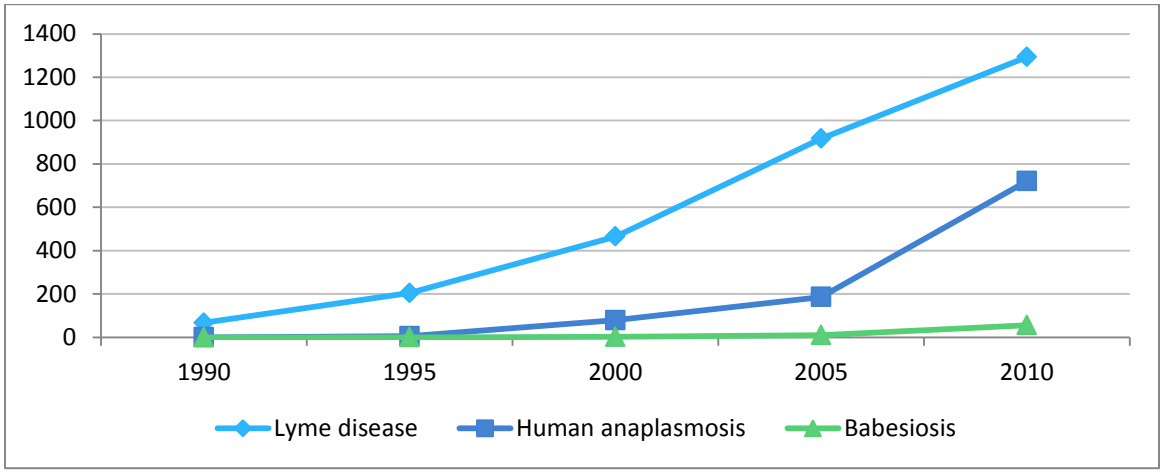
Tick-Transmitted Disease

Minnesota is a state that prides itself on its natural resources, and many Minnesotans participate in outdoor activities that put them at risk for the diseases carried by insects. Minnesota tick-borne disease case numbers have increased substantially in recent years. In 1990 there were 67 cases of Lyme disease and none of babesiosis or anaplasmosis; by the year 2000 there were nearly 500

cases of Lyme disease and 79 of babesiosis, and by 2010 there were nearly 1,300 cases of Lyme disease, over 700 cases of babesiosis, and 56 cases of anaplasmosis. Several less common and newly emerging diseases also have been reported in recent years, including Powassan virus disease, Rocky Mountain spotted fever, and a newly described form of human ehrlichiosis.

The blacklegged tick (or deer tick) transmits the agents of all of the diseases listed above except Rocky Mountain spotted fever. In general, the risk of tick-borne disease is higher in eastern Minnesota counties, and most diagnosed cases report blacklegged tick exposure in forested areas of east central, north central, and southeastern Minnesota. In recent years, however, blacklegged ticks have emerged in forested regions of the state where they had not previously been reported, particularly in west central and northern Minnesota.[41]

Tick-borne disease in Minnesota: 1990-2010*



Rates of tick-borne disease in Minnesota have increased tenfold since 1990.

	1990	1995	2000	2005	2010
Lyme disease	67	204	465	917	1293
Human anaplasmosis	0	5	79	186	720
Babesiosis	0	0	2	10	56

Source: Minnesota Department of Health, Acute Disease Investigation and Control Section. (2011).[42]

Foodborne Illness

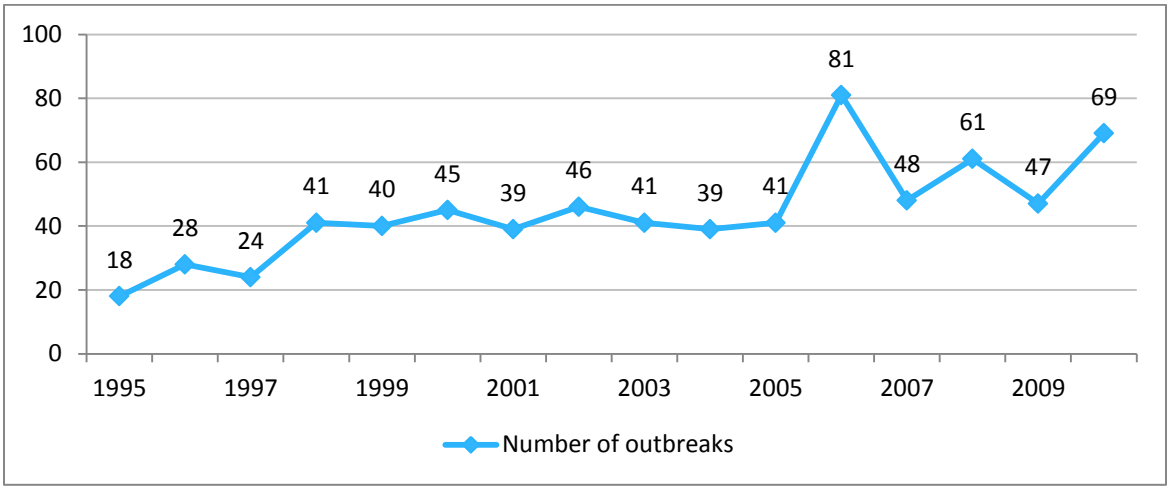
Food is part of the natural environment, although the origins of Minnesota's food supply range far beyond our state's borders. During the past few decades, the food supply system in Minnesota has become part of a complex global industry. Food contains natural chemicals from the original plant or animal sources, and may also come in contact with many natural and artificial substances during production, processing, and preparation. Potential food hazards include microorganisms, naturally present chemicals, chemicals produced by cooking, environmental contaminants, additives, and pesticides. Foodborne illness is caused by consuming food or beverages that are contaminated by disease-causing microbes or pathogens.

The annual number of confirmed foodborne illness outbreaks has gradually increased, from a median of 40 between 1995 and 2005 to a median of 46.5 between 2001 and 2010. Some (but not

all) of this increase is due to more effective outbreak monitoring like the establishment of a toll-free foodborne illness hotline in 1998.[43]

Confirmed foodborne outbreaks in Minnesota: 1995-2010

Reported foodborne outbreaks have increased in Minnesota during the past 15 years.



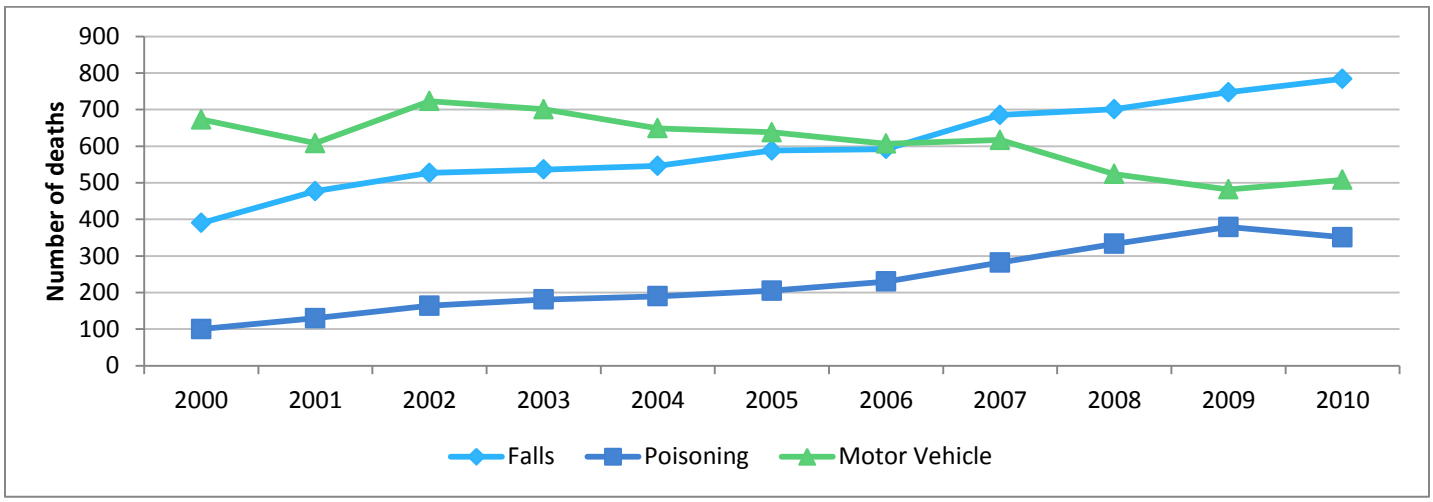
Source: Minnesota Department of Health; Foodborne, Vectorborne, and Zoonotic Diseases Program. (2011).[44]

Injury and Violence

Injury is the leading cause of death for children and young adults in Minnesota, but deaths are a small proportion of the impact of injury. For every one injury death, there are three severe traumas (including brain and spinal cord injuries), ten other hospitalized injuries, and 100 injuries that result in emergency department treatment only.

Injuries may be intentional (the result of violence) or unintentional. The leading causes of unintentional injury-related deaths in Minnesota between 2000 and 2009 were falls, motor vehicle crashes and poisoning. When all intent is factored into injury, then self-inflicted firearm injuries rank third and self-inflicted poisoning ranks sixth in overall injury-related mortality.[45]

Leading causes of unintentional injury deaths in Minnesota: 2000-2010



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Falls	390	477	527	536	546	588	592	685	701	747	784
Poisoning	100	130	164	181	190	205	230	282	333	379	351
Motor Vehicle	673	608	723	701	649	638	607	617	524	482	508

Source: Minnesota Department of Health, Minnesota Center for Health Statistics. (2011).[46]

Falls-Related Injury

Falls are the leading cause of injuries for children (under age 19) treated in hospital emergency departments, and the leading cause of hospitalized injury among persons over 65.

Falls can cause moderate to severe injuries, including hip fractures and head traumas, and increase the risk of early death. Among older adults (65+), falls are the leading cause of injury death, and Minnesota has one of the highest mortality rates due to falls among the elderly in the nation.

Minnesota has one of the nation's highest rates of death from falls among the elderly.

Falls-related mortality for older adults in the United States: 2009

States with highest rates of death from falls		*States with lowest rates of death from falls*	
State	Rate per 100,000*	State	Rate per 100,000*
Vermont	117.12	New Jersey	23.36
New Mexico	101.60	Alabama	25.04
Wisconsin	97.87	South Carolina	29.22
Minnesota	85.11	Louisiana	30.93
Colorado	84.53	New York	33.06

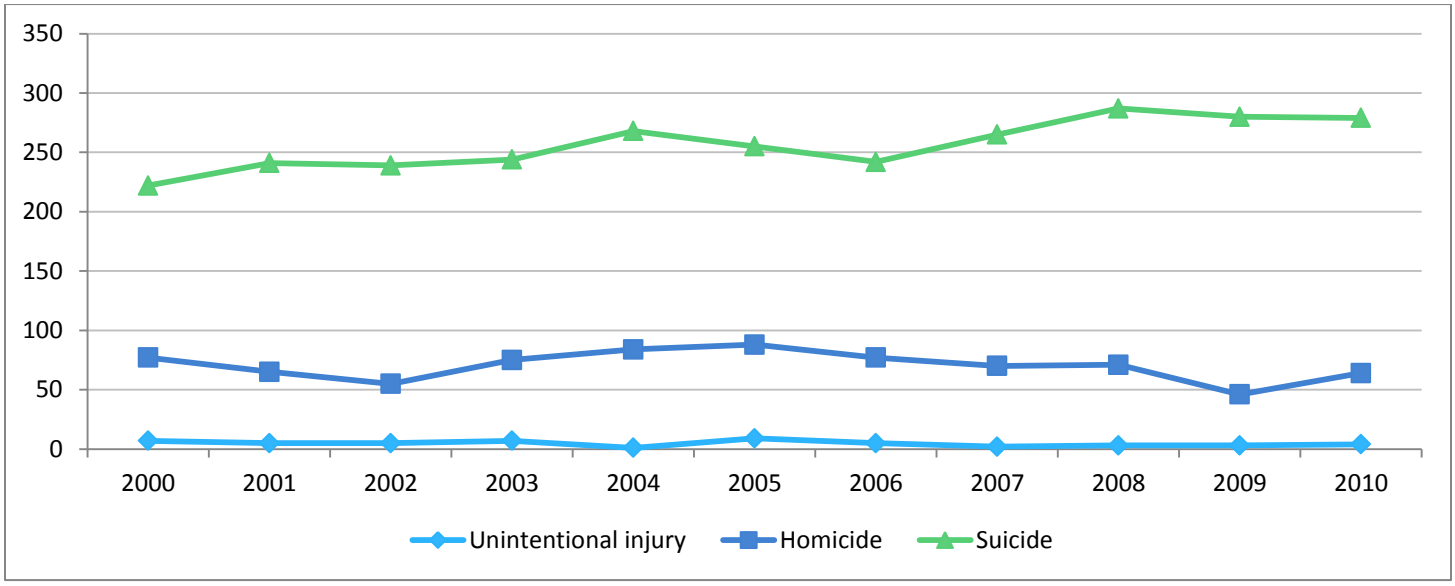
** Rate adjusted for age, in the year 2000; all races, both sexes, adults aged 65-85. Rate in Alaska (26.85) not included due to inadequate sample size. Source: Centers for Disease Control and Prevention. (2011).*[47]

The majority of firearm-related deaths in Minnesota are due to suicide.

Firearm Injury

Every day, approximately one Minnesotan dies and another is injured from a firearm. Firearms are the second leading cause of traumatic brain injury death in Minnesota. Nearly three-fourths of firearm-related deaths are suicides, however, rather than assaults or unintentional injuries on another person.

Firearm deaths in Minnesota: 2000-2010



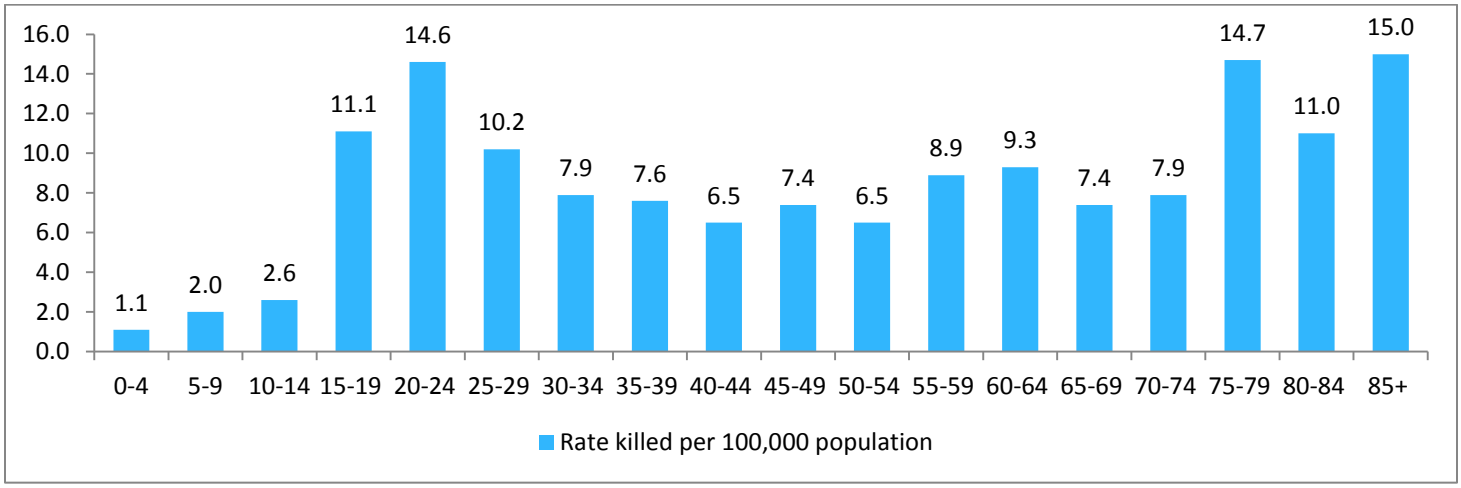
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Unintentional Injury	7	5	5	7	1	9	5	2	3	3	4
Homicide	77	65	55	75	84	88	77	70	71	46	64
Suicide	222	241	239	244	268	255	242	265	287	280	279

Source: Minnesota Department of Health, Minnesota Center for Health Statistics. (2011).[48]

Motor Vehicle Injury

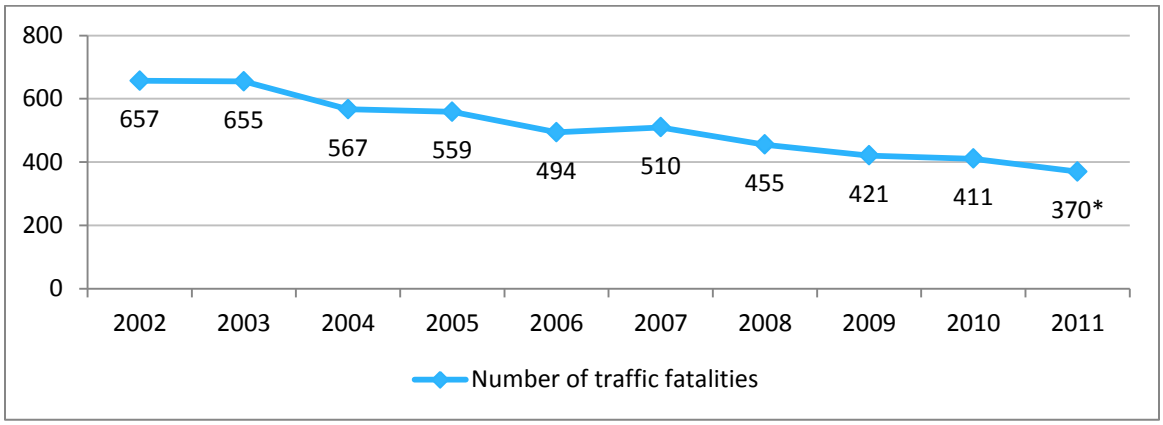
In Minnesota, motor vehicle-related injuries are the leading cause of injury-related death for individuals up to the age of 44, and for adults between 55 and 64.[49] While these rates are declining, teenagers and young adults still pay the heaviest price in terms of both deaths and injuries, including traumatic brain injuries and spinal cord injuries.

Motor vehicle death in Minnesota, by age group: 2010



Source: Minnesota Department of Health, Minnesota Injury Data Access System (2011).[50]

Traffic fatalities in Minnesota: 2002-2011



Motor vehicle crash-related mortality is highest among young adults and the elderly.

** Preliminary number.*
Source: U.S. Department of Transportation, National Highway Traffic Safety Administration.[51]

On an average day in 2011, at least one person died on Minnesota highways and at least three were seriously injured. Serious injuries prevent walking, driving or continuing other activities of daily life, creating both significant economic costs and a decline in the quality of life.

Those at greatest risk of injury from traffic crashes are 20- to 24-year-old drivers, elderly drivers, male drivers, unbelted occupants, and unrestrained children; pedestrian injuries are among the most expensive in terms of hospital charges.[52]

The numbers of teen-involved traffic crashes have decreased in recent years. In 2004, 23 percent of all traffic crashes in Minnesota were teen-related. In 2010, that percentage dropped to 18 percent. Consequently, teen (ages 13-19) fatalities and teen injuries have both decreased. In 2004, 16 percent of all traffic fatalities and 18 percent of all traffic injuries in Minnesota were among teens. In 2010, those percentages dropped to 11 and 15 percent, respectively.[53]

Fatalities on Minnesota's state and local roads fell for the fourth straight year in 2010, to 411, and are expected to fall again once a final count of fatalities is known for 2011. In 2009, Minnesota's fatality rate was third-lowest among the 50 states.[54]

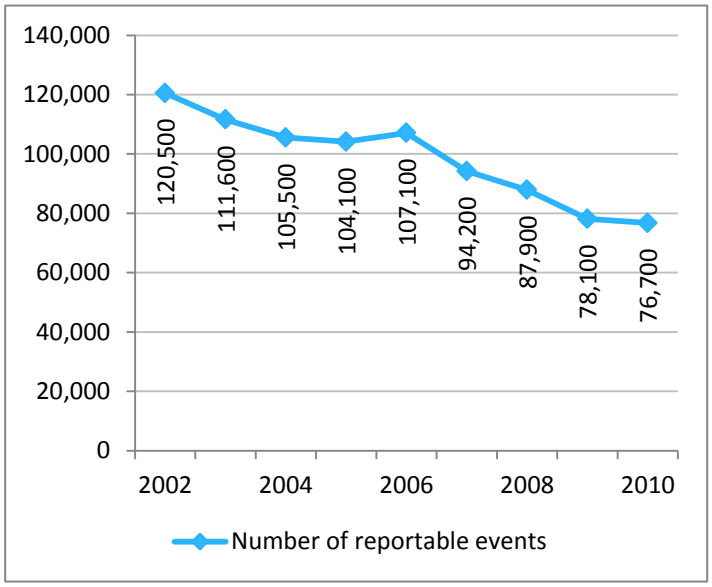
Work-Related Injury and Illness

Minnesota has over 2.5 million people in the labor force;[55] these workers spend up to half their waking lives at work or commuting. While employment has many obvious economic, social, and even health benefits, the workplace can be a significant source of injury and exposure to hazardous substances leading to disability, illness, and death. Workplace settings vary widely in terms of safety and risks to workers; workers too, differ by training, culture, gender, age, and access to resources, such as prevention information and preventive health care.[56]

Fatal workplace injuries in Minnesota: 2002-2010

Source: U.S. Department of Labor, Bureau of Labor Statistics. (2011).[57]

Non-fatal workplace injuries and illnesses in Minnesota: 2002-2010



Source: U.S. Department of Labor, Bureau of Labor Statistics. (2011).[58]

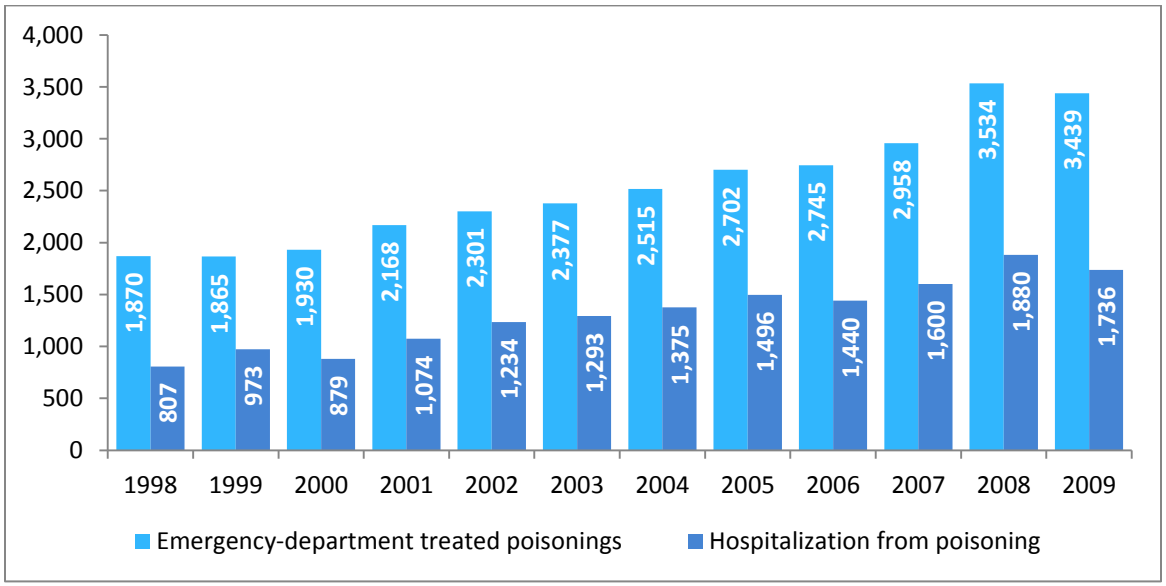
State and national databases track work injury-related deaths in industries such as agriculture, forestry, mining, construction, transportation and warehousing; conditions such as overexertion, repetitive motion, and hearing loss; and illnesses such as respiratory disease, elevated blood lead levels, and skin diseases.[59] In 2010, 69 Minnesotans succumbed to fatal work-related injuries,[60] and over 76,000 non-fatal occupational illnesses and injuries.[61] Approximately 90 percent of injuries occur among males, and rates tend to be higher among the youngest and oldest aged workers.

Prescription Drug Poisoning

Poisonings, both self-inflicted and unintentional, are leading causes of injury death and hospital-treated injury in Minnesota, and the numbers are growing. The main source of this increase is the misuse of prescription drugs.

Very few prescription drugs involved in overdoses come from pharmacy theft: about three-fourths are obtained from friends or family members. Rates of prescription drug overdoses vary widely by state; Minnesota's rate, at 7.2 per 100,000 population, is similar to surrounding states and about one-third of the rates for New Mexico (27.0 per 100,000), and West Virginia (25.8 per 100,000). The state with the lowest rate in 2010 was Nebraska, with not quite six deaths per 100,000.[62]

Unintentional poisoning in Minnesota: 1998-2009



The number of non-fatal, hospital-treated, unintentional poisonings has more than doubled between 1998 and 2008.

** Emergency department-treated. Source: Minnesota Department of Health, Minnesota Injury Data Access System. (2010).*[63]

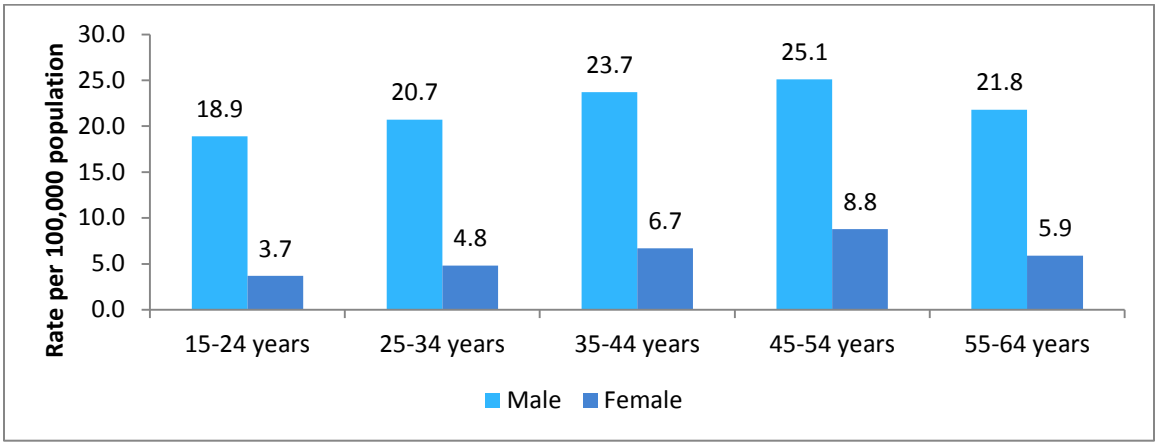
Suicide

In 2010, nearly six hundred Minnesotans died by suicide, an average rate of 11.3 per 100,000. Suicide rates are higher for males than for females, and the suicide rate among the American Indian population (18.3 per 100,000 for 2006-2010) is nearly double the rate in the state's white population (10.9 per 100,000).

- The number of people who died by suicide (599) in Minnesota in 2010 was more than five times higher than the number of homicide victims (111).
- Minnesota's suicide rate has been steadily climbing in the last ten years, from a low of 8.9 per 100,000 in 2000 to 11.1 per 100,000 in 2010.
- While many people assume that suicide rates are highest among teenagers, males over the age of 35 actually have the highest rates of suicide.

Suicide in Minnesota, by age group: 2006-2010

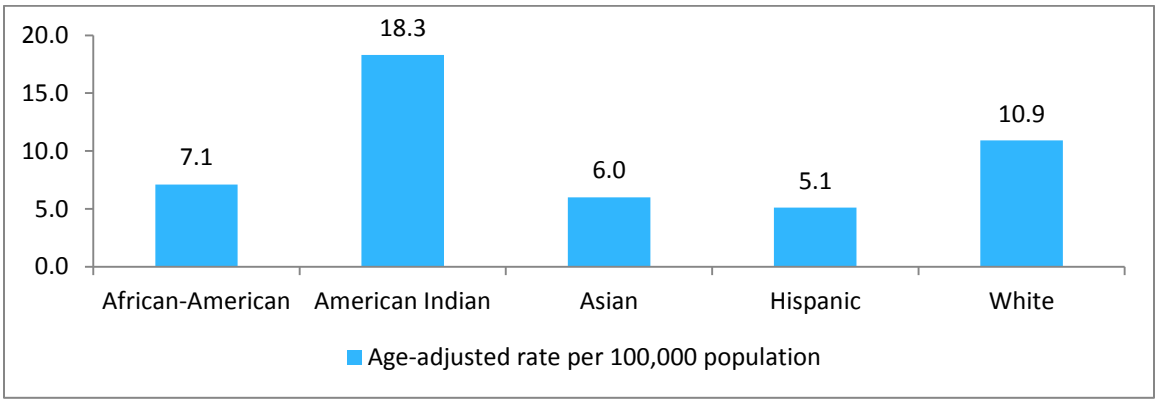
The rate of suicide among the state's males is much higher than that of females.



Source: Minnesota Department of Health, Minnesota Center for Health Statistics. (2011).[64]

Suicide in Minnesota, by race/ethnicity: 2006-2010

The rate of suicide among the state's American Indian population is nearly double that of the state's white population.

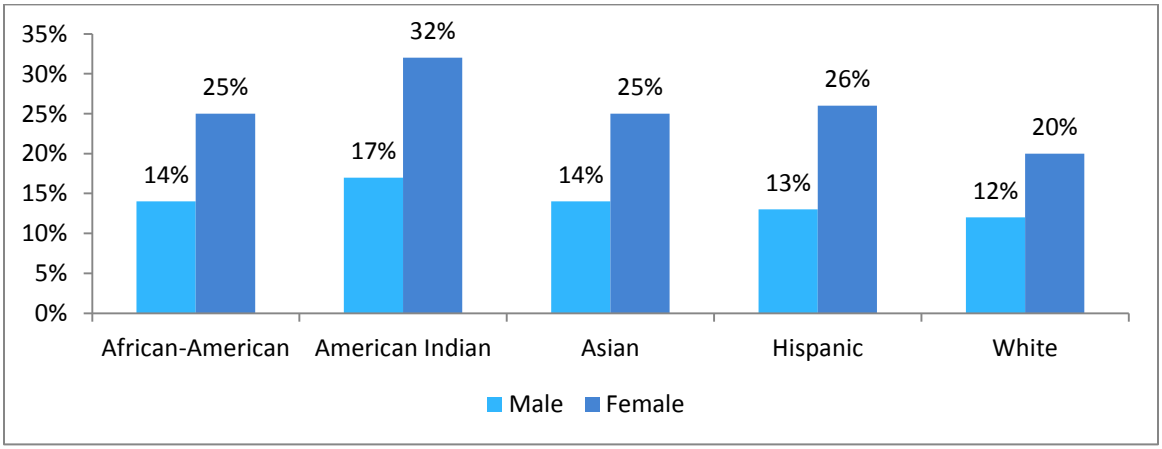


Source: Minnesota Department of Health, Minnesota Center for Health Statistics. (2011).[65]

Minnesota ninth-graders thinking about suicide: 2010

Minnesota ninth-graders who have thought about killing themselves during the past year

Minnesota's teen girls report thinking about suicide more than the state's teen boys.



Source: Minnesota Department of Health, Center for Health Statistics. (2011).[66]

Among adolescents, girls are much more likely to have thought about killing themselves than boys, and students of color are more likely to report both thinking about suicide and attempting suicide. American Indian students have the highest rate of attempted suicide among ninth-graders and the highest rate of death by suicide in Minnesota among all age groups.[67]

Vulnerable Adult Abuse

Adult protection report* victims in Minnesota: 2010

Age group	Victims (Count)	Percent of Victims
Under 30	1,912	10.7%
30 to 49	3,062	17.1%
50 to 64	3,444	19.2%
65 to 74	2,092	11.7%
85 and older	3,247	18.1%
Total	17,895	100.0%

Vulnerable adult abuse affects nearly 18,000 victims in Minnesota.

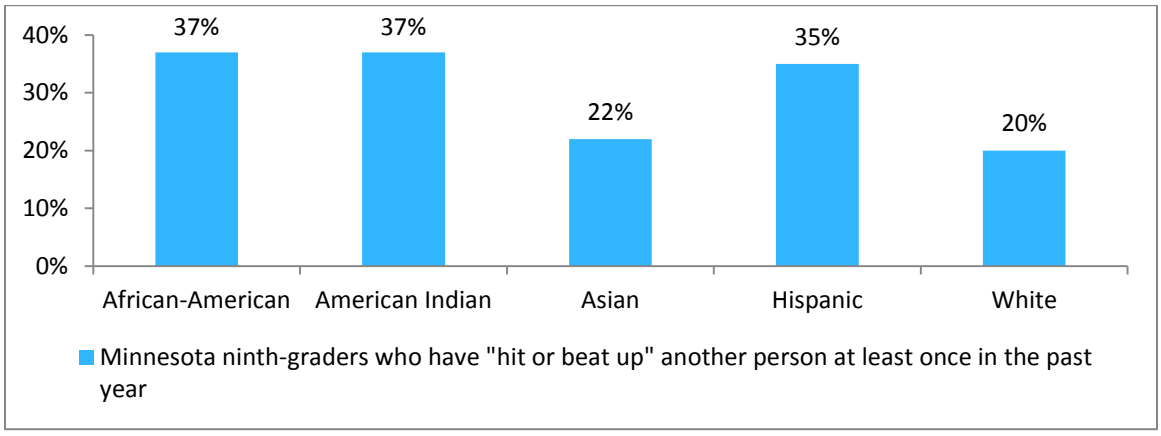
** Not yet substantiated. Number of reports: 23,909; number of victims: 17,905; missing data: 10.*
Source: Minnesota Department of Human Services, Data Warehouse. (2011, April).[68]

Vulnerable adults include the elderly and adults of all ages with physical or mental disabilities, whether living at home or being cared for in a health facility. The most reported victims are over age 85. Abuse and maltreatment of vulnerable adults can include physical, emotional, or sexual abuse; caregiver neglect; self-neglect; and financial exploitation.

Youth Violence

Among Minnesota students, younger students are more likely to engage in hitting or beating up another person; reports of hitting or beating up another person are more common in sixth and ninth grade than in 12th grade. In all three grades, African-American, American Indian, and Hispanic students are more likely than other students to report hitting or beating up someone.

Minnesota ninth-graders and physical violence: 2010



More than one-third of the state's Hispanic, American Indian, and African-American ninth-graders report involvement in violence.

Source: Minnesota Department of Health, Center for Health Statistics. (2011).[69]

Resources and References

Obesity

Minnesota Department of Health. *Overweight and obesity prevention: Fact sheets and data*. Retrieved January 1 2012 from http://www.health.state.mn.us/divs/hpcd/chp/cdrr/obesity/facts.html

Cancer

Minnesota Department of Health. (2011). *Chronic diseases and their risk factors in Minnesota*. Retrieved from http://www.health.state.mn.us/divs/hpcd/do/HPCDtrendreport2011.pdf

American Cancer Society, Midwest Division. (2011). *Minnesota cancer facts and figures: 2011*. Retrieved from http://www.health.state.mn.us/divs/hpcd/cdee/mcss/documents/mncancerfactsfigures2011033011.pdf

Heart Disease and Stroke

Peacock, J.M., & Shanedling, S. (2011). *Heart disease and stroke in Minnesota: 2011 burden report*. Minnesota Department of Health, Heart Disease and Stroke Prevention Unit. Retrieved from http://www.health.state.mn.us/divs/hpcd/chp/cvh/pdfs/hdspBurdenRpt2011.pdf

Injury and Violence

Minnesota Department of Public Safety. (2011). *Minnesota motor vehicle crash facts: 2010*. Retrieved from https://dps.mn.gov/divisions/ots/educational-materials/Documents/CRASH-FACTS-2010.pdf

From the Text

[1] Minnesota Department of Health, Center for Health Statistics. (2011). Vital Statistics 2009. *Minnesota VitalSigns 7*(1). Retrieved from http://www.health.state.mn.us/divs/chs/vitalsigns/2010natmorttrends.pdf
[2] Minnesota Department of Health, Center for Health Statistics. (2012).
[3] Minnesota Department of Health, Center for Health Statistics. (2012).
[4] Chronic Diseases and Their Risk Factors, MDH, 2011
[5] Minnesota Department of Health. (2010). *Alzheimer's disease*. Retrieved January 1 2012 from http://www.health.state.mn.us/divs/hpcd/alzheimer/
[6] HealthyPeople.gov. Arthritis, osteoporosis, and chronic back conditions. Retrieved February 24 2012 from http://www.healthypeople.gov/2020/topicsobjectives2020/overview.aspx?topicid=3
[7] Minnesota Department of Health, Office of Statewide Health Improvement Initiatives. (2011). *Chronic diseases and their risk factors in Minnesota: 2011.* Retrieved from http://www.health.state.mn.us/divs/hpcd/do/HPCDtrendreport2011.pdf
[8] Centers for Disease Control and Prevention. (2010). Behavioral Risk Factor Surveillance System.
[9] Centers for Disease Control and Prevention. (2010). Behavioral Risk Factor Surveillance System.
[10] Minnesota Department of Health. (2011). *Minnesota Public Health Data Access: Asthma hospitalizations: Basic facts and figures*. Analysis of Minnesota Hospital Discharge Data. Retrieved January 1 2012 from https://apps.health.state.mn.us/mndata/asthma_hosp
[11] Minnesota Department of Health. (2012). *Minnesota Public Health Data Access: Chronic obstructive pulmonary disease: Basic facts and figures.* Analysis of Minnesota Hospital Discharge Data from the Minnesota Hospital Association. Retrieved 26 April 2012 from https://apps.health.state.mn.us/mndata/copd

[12] American Cancer Society, Midwest Division. (2011). *Minnesota cancer facts and figures: 2011*. Retrieved from http://www.health.state.mn.us/divs/hpcd/cdee/mcss/documents/mncancerfactsfigures2011033011.pdf
[13] American Cancer Society, Midwest Division. (2011). *Minnesota cancer facts and figures: 2011*. Retrieved from http://www.health.state.mn.us/divs/hpcd/cdee/mcss/documents/mncancerfactsfigures2011033011.pdf
[14] American Cancer Society, Midwest Division. (2011). *Minnesota cancer facts and figures: 2011*. Retrieved from http://www.health.state.mn.us/divs/hpcd/cdee/mcss/documents/mncancerfactsfigures2011033011.pdf
[15] Minnesota Department of Health, Minnesota Cancer Surveillance System. *Cancer in Minnesota, 1988-2008* (In press). Saint Paul, MN.
[16] Minnesota Department of Health. (2011). *Minnesota Public Health Data Access: All cancer types combined: Basic facts and figures*. Analysis of data from Minnesota Cancer Surveillance System. Retrieved January 1 2012 from https://apps.health.state.mn.us/mndata/cancer_all
[17] Minnesota Department of Health, Office of Minority and Multicultural Health. *Priority health areas of the Eliminating Health Disparities Initiative: Breast cancer*. Retrieved January 1 2012 from http://www.health.state.mn.us/ommh/grants/ehdi/priority.html#bcancer
[18] American Cancer Society, Midwest Division. (2011). *Minnesota cancer facts and figures: 2011*. Retrieved from http://www.health.state.mn.us/divs/hpcd/cdee/mcss/documents/mncancerfactsfigures2011033011.pdf
[19] Roper-Baker, L. & Hanson, M.B. (2010). *Status of women and girls in Minnesota: Research overview*. Minnesota Women's Foundation. Retrieved from http://www.wfmn.org/research/2010Reports/2010StatusOfWomenGirls_FINAL_web.pdf
[20] American Cancer Society, Midwest Division. (2011). *Minnesota cancer facts and figures: 2011*. Retrieved from http://www.health.state.mn.us/divs/hpcd/cdee/mcss/documents/mncancerfactsfigures2011033011.pdf
[21] Centers for Disease Control and Prevention, National Center for Health Statistics. (2012). *Underlying Cause of Death 1999-2009*. Retrieved April 23 2012 from http://wonder.cdc.gov/ucd-icd10.html
[22] Minnesota Department of Health (2012). Analysis of Minnesota Hospital Discharge Data from the Minnesota Hospital Association.
[23] Peacock, J.M., & Shanedling, S. (2011). *Heart disease and stroke in Minnesota: 2011 burden report*. Minnesota Department of Health, Heart Disease and Stroke Prevention Unit. Retrieved January 1 2012 from: http://www.health.state.mn.us/divs/hpcd/chp/cvh/pdfs/hdspBurdenRpt2011.pdf
[24] Peacock, J.M., & Shanedling, S. (2011). *Heart disease and stroke in Minnesota: 2011 burden report*. Minnesota Department of Health, Heart Disease and Stroke Prevention Unit. Retrieved January 1 2012 from: http://www.health.state.mn.us/divs/hpcd/chp/cvh/pdfs/hdspBurdenRpt2011.pdf
[25] Minnesota Department of Health, Center for Health Statistics. (2011).
[26] Minnesota Department of Health, Minnesota Diabetes Program. (2010). *Diabetes and prediabetes in Minnesota.* Retrieved from http://www.health.state.mn.us/diabetes/pdf/FactSheet2010.pdf
[27] Centers for Disease Control and Prevention (CDC). (2011). *National Diabetes Surveillance System* [Data set]. Retrieved January 1 2012 from http://apps.nccd.cdc.gov/ddtstrs/default.aspx
[28] Minnesota Department of Health, Minnesota Diabetes Program. *Data and statistics.* Retrieved March 22 2012 from http://www.health.state.mn.us/diabetes/data/
[29] Parks, J., Svendsen, D., Singer, P., & Foti, M.E. (Eds.). (2006). *Morbidity and mortality in people with serious mental illness.* National Association of State Mental Health Program Directors (NASMHPD) Medical Directors Council. Retrieved from http://www.nasmhpd.org/general_files/publications/med_directors_pubs/Mortality%20and%20Morbidity%20Final%20Report%208.18.08.pdf
[30] Trangle, M., Mager, G., Goering, P., & Christensen, R. (2010). Minnesota 10 by 10: Reducing morbidity and mortality in people with serious mental illness. *Minnesota Medicine* (June 2010). Retrieved from http://www.minnesotamedicine.com/PastIssues/PastIssues2010/June2010/ClinicalTrangleJune2010.aspx
[31] McAlpine, D., Boudreaux, M., Call, K., & Beebe, T. (2011). *Estimating the need for treatment for substance abuse among adults in Minnesota: Results of the 2010 Minnesota Survey on Adult Substance Use.* Minnesota Department of Human Services, University of Minnesota School of Public Health. Retrieved from https://edocs.dhs.state.mn.us/lfserver/Public/DHS-6423A-ENG
[32] Trust for America's Health. (2010). *F as in fat: How obesity threatens America's future 2010*. Retrieved January 1 2012 from http://healthyamericans.org/reports/obesity2010/
[33] Centers for Disease Control and Prevention. (2011). *Behavioral Risk Factor Surveillance System*. Retrieved January 1 2012 from http://apps.nccd.cdc.gov/brfss/
[34] Minnesota Department of Health, Center for Health Statistics. (2011). *Minnesota Student Survey*. Retrieved January 1 2012 from http://www.health.state.mn.us/divs/chs/mss/

[35] Minnesota Department of Health, Heart Disease and Stroke Prevention Unit. *Overweight and obesity prevention: The importance of a healthy weight.* Retrieved March 22 2012 from http://www.health.state.mn.us/divs/hpcd/chp/cdrr/obesity/healthyweights.html
[36] Trogdon, J.G., Finkelstein, E.A., Feagan, C.W., & Cohen, J.W. (2012). State- and payer-specific estimates of annual medical expenditures attributable to obesity. *Obesity, 20*, 214-220.
[37] Centers for Disease Control and Prevention. (2009). *Pediatric and Pregnancy Nutrition Surveillance System* [Data set]. Retrieved January 1 2012 from http://www.cdc.gov/pednss/
[38] Minnesota Department of Health, Emerging Infections Unit. (2012). More information available at http://www.health.state.mn.us/divs/idepc/eip.html
[39] Minnesota Department of Health, Infectious Disease Epidemiology, Prevention and Control Division. (2010). *HIV/AIDS Prevalence and Mortality Tables*. Retrieved January 1 2012 from http://www.health.state.mn.us/divs/idepc/diseases/hiv/stats/pmtables2010.html
[40] Minnesota Department of Health, Infectious Disease Epidemiology, Prevention and Control Division. (2011). *STD Surveillance Statistics*. Retrieved January 1 2012 from http://www.health.state.mn.us/divs/idepc/dtopics/stds/stdstatistics.html
[41] Minnesota Department of Health, Foodborne, Vectorborn, and Zoonotic Diseases Program. (2010). *Tick-transmitted diseases*. Retrieved January 1 2012 from http://www.health.state.mn.us/divs/idepc/dtopics/tickborne/index.html
[42] Minnesota Department of Health, Foodborne, Vectorborne, and Zoonotic Diseases Program. (2011).
[43] Minnesota Department of Health; Foodborne, Vectorborne, and Zoonotic Diseases Program. (2011).
[44] Minnesota Department of Health, Foodborne, Vectorborne, and Zoonotic Diseases Program. (2011).
[45] Kinde, M. (Ed.). (2011). *Proceedings of Minnesota Safety Council: Third Annual Childhood Injury Summit: Injury trends, MN*. Saint Paul, MN. Retrieved from http://www.minnesotasafetycouncil.org/safekids/summit/2011/MinnesotaChildhoodInjuryDataBehindtheNumbers.pdf
[46] Minnesota Department of Health, Minnesota Center for Health Statistics. (2011).
[47] Centers for Disease Control and Prevention, Injury and Prevention Control: Data and Statistics. (2011). *Web-based injury statistics query and reporting system*. Analysis of data from NCHS Vital Statistics System and U.S. Census Bureau. Retrieved January 22 2012 from http://www.cdc.gov/injury/wisqars/index.html
[48] Minnesota Department of Health, Minnesota Center for Health Statistics. (2011).
[49] Minnesota Department of Health, Health Promotion and Chronic Disease Division. (2012). *Ten leading causes of injury death by age group: Minnesota 2000-2009*. Retrieved from http://www.health.state.mn.us/injury/pub/charts/Leading_Causes_Injury_Death_2000-2009.pdf
[50] Minnesota Department of Health, Minnesota Injury Data Access System (2011). Retrieved January 12 2012 from http://www.health.state.mn.us/injury/midas/ub92/
[51] U.S. Department of Transportation, National Highway Traffic Safety Administration. More information available at http://www-nrd.nhtsa.dot.gov/cats/index.aspx
[52] Minnesota Department of Health, Injury and Violence Prevention Program. (2002). *Best practices to prevent motor vehicle crashes*. Retrieved January 1 2012 from http://www.health.state.mn.us/injury/best/best.cfm?gcBest=car
[53] Minnesota Department of Public Safety. (2011). *Minnesota motor vehicle crash facts: 2010*. Retrieved from https://dps.mn.gov/divisions/ots/educational-materials/Documents/CRASH-FACTS-2010.pdf
[54] U.S. Department of Transportation, National Highway Traffic Safety Administration. (2009). *Traffic safety performance (core outcome) measures for Minnesota.* Retrieved April 26 2012 from http://www-nrd.nhtsa.dot.gov/departments/nrd-30/ncsa/STSI/27_MN/2009/27_MN_2009.htm
[55] U.S. Department of Labor, Bureau of Labor Statistics. (2011). *May 2011 state occupational and wage estimates: Minnesota*. Retrieved April 26 2012 from http://www.bls.gov/oes/current/oes_mn.htm#00-0000
[56] U.S. Department of Health and Human Services. *Occupational safety and health*. Retrieved April 26 2012 from http://www.healthypeople.gov/2020/topicsobjectives2020/overview.aspx?topicid=30
[57] U.S. Department of Labor, Bureau of Labor Statistics. (2011). *State occupational injuries, illnesses, and fatalities: Minnesota.* Retrieved April 26 2012 from http://www.bls.gov/iif/oshstate.htm#MN
[58] U.S. Department of Labor, Bureau of Labor Statistics. (2011). *State occupational injuries, illnesses, and fatalities: Minnesota.* Retrieved April 26 2012 from http://www.bls.gov/iif/oshstate.htm#MN
[59] Centers for Disease Control and Prevention. *All workplace safety and health topics.* Retrieved April 26 2012 from http://www.cdc.gov/niosh/topics/
[60] U.S. Department of Labor, Bureau of Labor Statistics. (2011). *Fatal occupational injuries in Minnesota*. Retrieved April 26 2012 from http://www.bls.gov/iif/oshwc/cfoi/tgs/2010/iiffi27.htm
[61] U.S. Department of Labor, Bureau of Labor Statistics. (2011). *Numbers of nonfatal occupational injuries and illnesses by industry and case types, 2010*. Retrieved from http://www.bls.gov/iif/oshwc/osh/os/pr107mn.pdf

[62] Centers for Disease Control and Prevention. (2011). *Policy impact: Prescription painkiller overdoses*. Retrieved January 1 2012 from http://www.cdc.gov/homeandrecreationalsafety/rxbrief/
[63] Minnesota Department of Health, Minnesota Injury Data Access System. (2010). Analysis of Minnesota Hospital Discharge Data. Retrieved August 20 2010 from http://www.health.state.mn.us/injury/midas
[64] Minnesota Department of Health, Minnesota Center for Health Statistics. (2011).
[65] Minnesota Department of Health, Minnesota Center for Health Statistics. (2011).
[66] Minnesota Department of Health, Center for Health Statistics. (2011). *Minnesota Student Survey*. Retrieved January 1 2012 from http://www.health.state.mn.us/divs/chs/mss/
[67] Minnesota Department of Health, Mental Health Promotion. *Suicide trends in Minnesota.* Retrieved March 22 2012 from http://www.health.state.mn.us/divs/cfh/connect/index.cfm?article=suicideprevention.suicidetrend
[68] Source: Minnesota Department of Human Services, Data Warehouse. (2011, April).
[69] Minnesota Department of Health, Center for Health Statistics. (2011). *Minnesota Student Survey*. Retrieved January 1 2012 from http://www.health.state.mn.us/divs/chs/mss/