Michigan Surgeon General's

HEALTH STATUS
REPORT

HEALTHY MICHIGAN 2010

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Acknowledgements

More than 200 Department of Community Health employees contributed to the creation of the Healthy Michigan 2010 report. These outstanding individuals work in the following areas:

Bureau of Epidemiology
Bureau of Health Promotion and Disease Control
Division of Chronic Disease and Injury Control
Tobacco Section
Division of HIV/AIDS-STD
Division of Family and Community Health
Children's Special Health Care Services Plan Division
Bureau of Laboratories - Infectious Disease Division
Medical Services Administration
Bureau of Substance Abuse and Addiction Services
Bureau of Community Mental Health Services
Health Policy, Regulation, and Professions Administration

April 8, 2004

To the Citizens of Michigan,

We are proud to present you with Healthy Michigan 2010, a health status report on key health issues in the state of Michigan. This report will serve as a valuable tool as we work cooperatively with local, state and federal partners to make Michigan a healthier place to live, work and raise a family.

Michigan has a proud history of innovation and leadership in health care. Our focus at the Michigan Department of Community Health is to build on this history to strengthen health care and improve the health status of the citizens of Michigan. As the first state in the nation to have a Surgeon General, Michigan can lead the way in making dramatic improvements in the state of our health.

Our challenge from Governor Jennifer M. Granholm is clear: bring back a focus on prevention in health care to help improve Michigan's economy. If we can reduce the demand for sickness care, we can see great improvements in our state.

As the Governor pointed out in her 2004 State of the State Address, there is a direct link between our collective health status and Michigan's economic outlook. By addressing these critical issues that affect long-term health, we can ensure that Michigan's workforce remains productive and vibrant, thereby reducing health care costs and making the state a more attractive place to locate a business.

At the Department of Community Health, we also continue to strive for a healthier Michigan by promoting access to the broadest possible range of quality services and supports, by taking steps to prevent disease, and by striving to deliver those services and supports in a fiscally prudent manner.

The Healthy Michigan 2010 report is the first of many initiatives that we will use to guide our work as we strive to increase physical activity, reduce obesity, eliminate our dependency on tobacco, promote health, prevent disease, and achieve healthier outcomes for Michigan. We also would like to thank the more than 200 Department of Community Health employees who actively contributed to this report.

Read about where we are and where we want to go to become as the nation's health leader. Then after reading, let's act. We invite you to work with us at the Department of Community Health as we endeavor to achieve these goals together.

Sincerely,
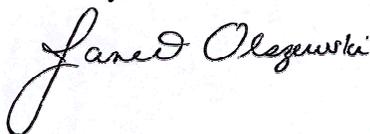
Janet Olszewski
Director

Kimberlydawn Wisdom, MD
Michigan Surgeon General

Executive Summary

The definition of health is more than the absence of illness or disease. A broader definition of health that includes aspects of mental, emotional, spiritual, and social well-being should be used. Recognizing and eliminating risk factors that lead to negative health outcomes may improve the quality and life expectancy of Michiganians. The Michigan Department of Community Health (MDCH) continually strives to provide knowledge and resources, thus empowering Michigan residents to improve health behaviors. One such activity is a health improvement process entitled Healthy Michigan 2010.

Healthy Michigan 2010 (HM2010) is akin to Healthy People 2010, which is *"a set of health objectives for the Nation to achieve over the first decade of the new century…to help them develop programs to improve health."* The HM2010 planning process began in early 2003 to re-evaluate Michigan's critical health issues, and develop new health goals, objectives and strategies to guide health policy and improvement in Michigan through the year 2010.

The HM2010 process began with a team of MDCH experts led by Michigan's first Surgeon General, who were charged with developing Michigan's Health Status Report. This report identifies ten primary health focus areas and underlying indicators for the State of Michigan. Healthy Michigan 2010*: A Health Status Report* is the first in a series of documents to be compiled in Michigan's health improvement process.

The ten focus areas in *A Health Status Report* are: Chronic Disease, Lifestyles, Tobacco, Substance Abuse, Mental Health, Maternal and Child Health, Immunizations, Injuries and Violence, Healthy Environments, and Infectious and Emerging Diseases. Notably, each item on the Michigan Surgeon General's agenda of health priorities is represented in *A Health Status Report*.

Michigan's Demographic, Socioeconomic and Healthcare Profile
According to the 2000 Census, Michigan had the eighth largest population in the United States. Over three-quarters of the residents live in metropolitan areas. Minority populations are increasing in proportion, compared to the population as a whole.

Michigan has recently been facing socioeconomic challenges, as illustrated by the recent increase in the unemployment rate. Almost 14 percent of children under the age of 18 in Michigan were living in poverty per the 2000 Census. While this was less than the national average of nearly 17 percent, there is still cause for concern because children living in poverty may have increased health risks and lack health insurance to cover primary healthcare needs.

While Michigan has high numbers of persons with insurance coverage, many residents are uninsured or underinsured and are unable to consistently access quality healthcare. Medicaid provides coverage for approximately 10% of Michigan's population, but residents still face other challenges in accessing healthcare. For example, recruitment and retention of medical personnel is a growing problem.

In 1999, over 3.2 million Michiganians were medically underserved and over 1.5 million were unserved. This issue appears to affect rural Michiganians more, as they must travel longer distances for care. Rural residents (12.4%) had a slightly greater risk for being without health insurance than urban residents (11.7%). However, almost nine out of ten residents (87.9%) without health insurance coverage live in an urban area. Michigan has a lower percentage of uninsured residents, on average, than the United States, but has over 1.1 million uninsured residents. Residents at the greatest risk of being uninsured are young adults (particularly those ages 21-24), minorities, and the working poor (less than 200% of poverty).

Healthy Michigan 2010: *A Health Status Report* provides an overview that includes leading causes of death and premature death, life expectancy, preventable hospitalizations, disabilities, and a summary of Michigan's healthcare system. Highlights from this section in the report are as follows:

- Life expectancy has increased for all races over the last several decades. Michigan's white population is estimated to live six-and-a-half years longer than the black population. Black males have the shortest life expectancy at 67.3 years, while white females continue to have the longest life expectancy at 79.9 years.
- Leading causes of death in Michigan have changed over time, moving from those of infectious diseases to deaths due to chronic diseases such as cancer and heart disease, or diseases associated with aging.
- Premature causes of death are greatly influenced by health behaviors, lack of social support, and/or chronic stress.
- Among whites and blacks of both genders, the leading causes of premature death were predominantly due to chronic illnesses. However, homicide is the second leading cause of premature death and the third leading cause of overall death in black males.
- Heart and lung problems were among the four leading causes of preventable hospitalizations among Michigan residents.
- Over 19% of Michigan residents have some type of disability, which is higher than the United States. Detroit is estimated to have one in four persons (28.3%) with some type of disability.
- In Michigan, 42% of the uninsured have used the emergency room as their source of care or have no regular source of care.
- Each year, Federally Qualified Health Centers (FQHCs) serve approximately 350,000 Michigan residents who are either uninsured or have inadequate coverage.

Michigan's Health Status Profile
Focus areas and status indicators determined for use in this report are presented in non-specific order and are not classified by level of importance. Additionally, there are ten focus areas containing several indicators for review. Each indicator includes an overview and a description of Michigan's status. There is also a section that provides the Nation's *Healthy People 2010* goals that relate to the reported Michigan health indicator. The next section discusses the impact of disparities that may exist by race, age, gender, etc. Finally, additional information that helps the audience better understand the indicator is included.

Chronic Disease
The first focus area, *Chronic Disease*, shows that Michigan's 65 and older age group is growing steadily. As the population ages, chronic illnesses increase in prevalence. Indicators reported are:

breast, cervical and colorectal and prostate cancer; heart disease; stroke; diabetes; end-stage renal disease; asthma hospitalizations and deaths; arthritic and other rheumatic conditions; and osteoporosis.

Michigan is making strides in preventing chronic diseases. The following are evidence of improvement in chronic disease prevention and control:

- From 1990 to 2000 breast cancers that were diagnosed at an early, more survivable state increased from 52.3% to 61.1%.
- Almost 61% of Michigan men and women 50 years and older have had at least one sigmoidoscopy or colonoscopy.
- Between 1990 and 2000 there has been a significant decrease in the asthma hospitalization rate in children <18 years (from 32.6 to 26.6) as well as in older adults (65+) (from 25.7 to 15.2).
- Michigan met the national Healthy People 2010 target rate for asthma mortality for adults ages 65 and older between 1999 and 2001 (54.8 in 2001).

However, significant racial disparities in many chronic diseases exist including:

- Black women reported lower breast screening rates (48.5%) and higher breast cancer mortality rates (58%) than white women.
- The incidence rate for cervical cancer in black women (10.6/100,000) is higher than that of white women (7.8) who also have a higher five-year survival rate.
- Blacks diagnosed with colorectal cancer at *any* stage are less likely than other races to survive five years.
- Minority populations have higher diabetes prevalence rates than the overall population (Black 11.3/100; Hispanic 6.2; Native American 9.4; Overall 8.1/100).
- In 2001, the asthma hospitalization rate for black persons age 5-64 was about 5 times higher than the rate for white persons (39.2 vs. 8.0/100,000).

Additional concerns in the realm of chronic disease involve increasing medical expenses and out-of-pocket expenses.

Healthy Lifestyles

When it comes to healthy lifestyles, such as physical activity, healthy weight, and good nutrition, Michigan has room for improvement. Over 50 percent of adults reported participating in physical activity less than the recommended 30 minutes per day. Twenty-five percent said that they participated in no leisure time physical activity at all. The rate of obesity, especially in Michigan's children, is of particular concern.

- Seventy-five percent (75%) of Michigan adults and 79% of students surveyed ate less than the recommended five servings of fruits and vegetables a day.
- Michigan ranks the third worst among the states for rate of obesity and has been among the ten heaviest states for the past 14 years.
- Sixty-two percent (62%) of adults in Michigan are considered either overweight or obese.
- A majority of high school students and adults indicated that they were trying to lose or maintain weight.

Tobacco
Tobacco use is the leading preventable cause of morbidity and mortality in the U.S. In Michigan, there has been progress in educating youth, but smoking-related morbidity and mortality persist:

- The percentage of youth smoking among high-school students has declined in the past decade, especially from 1999 (34.1%) to 2001 (27.6%).
- An estimated 24.1% of adults in Michigan smoked in 2002, a slight drop from 2001.
- About 1,800 Michiganians die annually from exposure to secondhand smoke.
- There are a total of over 16,000 tobacco-related deaths in Michigan each year.

Substance Abuse
Michigan's rate of death with an underlying cause of alcohol *and* deaths that were drug-induced were below the national rate. However, throughout the last decade, the age-adjusted rate for drug deaths has increased 81.8%, from 4.4 in 1991 to 8.0 in 2001, in Michigan.

Mental Health
Mental Health issues, another focus area for this report, are more prevalent than statistics may indicate. It is estimated that in the year 2000 about 412,000 Michigan adults had a serious mental illness. Unfortunately, suicide rates are the only reliable indicator reported for mental health, and these rates have changed very little in the past decade.

Maternal and Child Health
The health of women before, during and after pregnancy is an important factor in determining the health of their infants and children – who represent one of the most vulnerable populations. Both pre- and postnatal care support healthy outcomes. This chapter focuses predominantly on health indicators associated with infants and young children, but also discusses maternal morbidity and mortality commonly associated with childbirth.

In some cases, tremendous improvement in the health of mothers and infants has been achieved. For instance:

- Michigan's adequate prenatal care rate, showing a slight improvement in 2001, is equivalent to that of the United States at about 83 percent.
- Overall SIDS deaths have declined by almost 60% from 1.7 in 1992 to .5/1,000 in 2001.
- Breastfeeding rates in Michigan have been steadily increasing and reached an all-time high in 2001 at 64.3%.
- In 2001, Michigan's rate of teen pregnancy (35.2/1,000) and rate of teen births (21.3/1,000) for 15-17 year olds have steadily decreased since 1990.
- From 1992-1996 Michigan ranked tenth nationally in teen pregnancy rate reduction.

There are also obstacles to improving maternal and infant health that still must be addressed:

- There has been little increase in the percentage of women beginning prenatal care during the first trimester of pregnancy in Michigan since the 1970s.
- The majority (>80%) of post-neonatal deaths are due to preventable causes.
- The higher infant mortality rate in Michigan, as compared to the U.S., is due to a greater disparity between black and white infant deaths than in other states.
- The birthrate for black females in the 10-14 year-old age range is eight times higher than the rate for white females in the same age group in 2001 (2.4 vs. .3/1,000).

Other health indicators represented in this section highlight concerns related to younger children and adolescents. Highlights from this age group are:

- In 2002, 4.4% of children under age six in Michigan were identified as lead poisoned, nearly double that of the U.S. rate.
- From 1987 to 2000, the number of youth accessing School-based/linked Health Centers for primary care increased each year. About 60% of youth accessing these clinics were covered by Medicaid.

Immunizations

Immunizations are imperative to keeping the population healthy. For infants and children, immunizations are essential because these groups have undeveloped immune systems and are more susceptible to certain illnesses. Michigan has made significant headway with respect to the provision of childhood immunizations. For example, Michigan has moved from a 70 percent immunization level (2001) to 81.6 percent in 2002 for doses of 4:3:1:3:3 series, for children age 19-35 months. This is the sixth highest immunization level in the United States. Due to vaccinations, Michigan has had success in reducing vaccine preventable diseases to nearly zero.

Injury

Unintentional injuries are the fifth leading cause of death for all ages in Michigan. Injury data presented in *A Health Status Report* includes total injury deaths, motor vehicle injury deaths, fall injury deaths, and poisoning deaths. Some points of interest contained in the report are:

- Michigan's motor vehicle injury death rate decreased 27% between 1990 and 2001.
- Michigan had a 55% increase in fatal falls from 1998 to 2001.
- Male death rates for each reported type of injury death were higher than those rates of female injury deaths.

Violence

Violence includes a range of offenses, from assault to homicide. Homicide, rape, physical assault, and youth violence are included in this section of *A Health Status Report*. While violent crime is likely underreported, each reported offense type shows progress, but also offers reason for concern for Michigan's health.

- In Michigan, homicide rates have declined 35% since 1992.
- Homicide is nearly five times as likely to occur to blacks as it is to other races, increasing to 13 times greater when compared to whites alone.
- While over 5,400 rape offenses were reported in Michigan, the actual number is expected to be six to seven times higher due to unreported cases.

Healthy Environments

The environment in which people work and live can have a negative affect on their health. This chapter discusses work-related injuries, deaths, incidence of work-related lead exposure, and pesticide exposure rates, for example:

- Every other day in Michigan a worker dies from an injury sustained at work.
- Work-related injuries in the private sector decreased 32% from 1992 to 2001. Younger workers age 20-34 are more at risk of injury.

Infectious and Emerging Diseases

Michigan has been very successful in reducing the occurrence of many communicable diseases that historically caused illness and death. The final section in summarizing the health status of Michigan is divided into two sections: Infectious Diseases and Emerging Diseases. Infectious diseases covered are those with at least five years of data on which to report. The emerging diseases section offers a sample of the diseases that were relatively foreign to Michigan until recently and are anticipated to be observed in the future.

Infectious Diseases
- There is concern over the increase in resistance among organisms being monitored in hospital studies.
- The number of cases of E coli O157 has varied over the years, but a disproportionate number of cases (40%) still occur among children under age 19.
- Cases of Lyme disease may be increasing in the Southwestern region of Michigan, where it did not previously exist in high numbers.
- The number of cases and the rate of tuberculosis are steadily declining, albeit a slower decline now than in the past.
- Due to an increase in the use of drug therapies, the number of people living with HIV/AIDS in Michigan has steadily increased and the number of deaths due to HIV/AIDS is decreasing.

Emerging Diseases

Emerging diseases defined in *A Health Status Report* include Monkeypox, Severe Acute Respiratory Syndrome (SARS) and West Nile Virus. These diseases are not altogether new, but have recently been discovered in North America. The only emerging disease with cases identified in Michigan is West Nile Virus.

Stepping into the Future of Michigan's Health

For the most part, the health of Michiganians has been improving over time. Modern medicine, health education, outreach, and rapid response to disease outbreaks have improved health outcomes. As Michigan's state of health is affected by a diverse set of issues, such as the aging of the population and economics, initiatives around health improvement must continually adjust to keep up with the changing needs of the population. Ultimately, Michigan's goal is to be the healthiest state in the nation.

There is a link between the health status and economic status in Michigan. As portrayed in Healthy Michigan 2010: *A Health Status Report,* the unhealthy lifestyles of Michigan's residents has led to higher obesity, diabetes, heart disease, and other chronic disease rates. Each of these factors has led to increase in the cost of health care throughout the state. Employers in Michigan often incur these health costs causing them, as well as potential new employers in Michigan, to question the impact of this cost on their bottom line. By recognizing that health status is a major denominator in the economic status of Michigan, we can take a step towards committing to a healthier lifestyle and inviting employers to take a more favorable glance at becoming a part of Michigan's economy.

Since the summer of 2003, Michigan's Surgeon General, Kimberlydawn Wisdom, MD, has been completing her Surgeon General Rounds, where information on multiple health topics has been

presented to various health agencies in Michigan. Each group reflected on how the health of Michigan could be improved. A planning session was held to guide in the development of a public health strategic plan. These discussions, along with *A Health Status Report*, will assist Michigan's Surgeon General in developing *A Prescription for Health*, which will be a "call to action" for Michigan's residents. While the initial health plan will be for one to two years, a long-term strategic plan will be developed consisting of goals and objectives for the Department of Community Health and partnering agencies to strategize to improve Michigan's health.

Health is an investment that continues to benefit every citizen. Continual surveillance and measurement of health outcomes, as well as policies that will help Michigan's environment become more health-friendly to its residents may need to be enacted. Additionally, new initiatives may need to be pursued and implemented based on changing health needs. The Surgeon General will build collaborative relationships between stakeholders in Michigan to strengthen Michigan's public health system and develop sound public health policy. Stronger community and state partnerships, as well as policy development can help make the goal of improving Michigan's health a reality.

Healthy Michigan 2010: *A Health Status Report*

MICHIGAN DEMOGRAPHIC PROFILE

Michigan is diverse in its geography, its economy and its people. The state is made up of two peninsulas of land separated by the Straits of Mackinac. Michigan is bordered on the north by Lake Superior, on the west by Lake Michigan and Wisconsin, and on the east by Ontario, Canada and Lakes Huron and Erie. Ohio and Indiana border it on the south and within its boundaries are 83 counties. The estimated year 2000 population was over 9.9 million, making Michigan the eighth most populous state. Twenty-five counties (30%) are designated urban, although 82% of the population lives in metropolitan areas, a slightly higher percentage than in the rest of the U.S. (80%). Forty-five percent of Michigan's population lives in the Detroit Primary Metropolitan Statistical Area, which includes Wayne, Macomb, Oakland, Lapeer, St. Clair, and Monroe counties.

Population by Gender/Race/Ethnicity

According to year 2000 single race population estimates, 80.2% of the population in Michigan is white, 14.2% black or African American, and 1.8% Asian. American Indians or Alaskan Natives make up less than 1% of Michigan's population. A little over 3% are of Hispanic origin, an increase from 2.2% in 1990. The gender distribution is 51% female and 49% male. Approximately 12% of Michigan residents are over age 65.

MICHIGAN SOCIOECONOMIC PROFILE

Michigan compares favorably on socioeconomic factors with the rest of the U.S. An estimated 86.2% are high school graduates and of those, nearly one in four (23%) have a college degree or more (US: 84.1%, 25.6%, respectively). In 2002, the estimated **per capita personal income** in Michigan was $30,222 compared to $30,832 for the U.S., ranking Michigan 18th among all states. Eight out of ten residents are **private wage** or **salaried workers** (83.1%) compared to 77.4% in the nation. Nearly one quarter (22.5%) of Michigan's workers are employed in manufacturing. Between 1993 and 2002, the unemployment rate was at its lowest in 1998 (Michigan: 3.8%, US: 4.2%) and rose to higher levels in 2002 (Michigan: 6.2%; US: 5.8%).

Child Well-being

Economic indicators of child well-being are critical to assess a state's capacity to support one of its most vulnerable populations. Information from the 2000 census suggests that Michigan fared slightly better than the U.S. as a whole on some of these indicators. The proportion of children under age 18 who were below poverty was 13.9% in Michigan (16.6% in the U.S.), and the proportion of children, aged 15 to 17 years, having difficulty speaking English was estimated at 2.5% (6.6% in the nation). Sixteen percent of Michigan's children lived in high poverty neighborhoods (20% or more of the population is below poverty), while 20.4% of their national counterparts did. Among adolescents aged 16 to 19, 8.7% in Michigan and 9.8% in the U.S. were high school dropouts.

HEALTH COVERAGE & PUBLIC HEALTH INSURANCE

Access to care, including healthcare coverage, is a crucial marker of population well-being. The system of financing healthcare in Michigan resembles that of many other states, with employer groups contracting with insurance companies and **Health Maintenance Organizations (HMOs)** to obtain the best benefits for their employees. In 2000, approximately 27% of the State's

population was enrolled in a managed care organization (US: 29.7%). Managed care penetration in Michigan tends to be significant in the southern part of the state. To support more vulnerable groups, the Medicaid program provides coverage for approximately 10% of Michigan's population. In terms of insurance coverage, data from the 2002 Michigan **Behavioral Risk Factor Surveillance Survey (BRFSS)**, an annual statewide telephone survey designed to measure lifestyle and other factors associated with **mortality** and **morbidity**, indicates that 13.8% of respondents between the ages of 18 and 64 had no public or private healthcare coverage at the time of the survey. Nearly one in five blacks (19.7%) in this age group indicated they had no coverage, a percentage that was significantly higher than among whites (11.9%). Of those with a household income of less than $20,000, over one in three (36.7%) lacked healthcare coverage, nearly one in seven was unable to get medical care some time in the past 12 months, and one in four (24.9%) said they had no personal healthcare provider.

According to the Michigan Department of Community Health's/Michigan Primary Care Association's *Primary Healthcare Profile of Michigan*, published in February 2002, among the over 9.9 million residents of Michigan, 3,231,922 were **medically underserved** during 1999 (32.9%) and 1,575,861 (16.1%) were **unserved**.

The *Profile* also stated that in 1999, there were 1,166,727 persons without health insurance. Of those, 239,209 were aged 18 and younger and 8,500 were 65 and older. Among all age groups, 262,522 were below 100% of the **Federal Poverty Level** (FPL), 348,588 were 100-199% of FPL and 555,617 were over 200% of the FPL.

Using three-year aggregate data, in 1999-2001, 11.7% of Michigan residents were uninsured among persons aged 0-64. During that time frame, 16.8% of U.S. residents were uninsured.

Michigan's manufacturing base contributes to our state's high level of employer-based coverage. During 1999-2001, 73.5% of Michigan residents had employer-based insurance coverage, as contrasted with the national rate of 66.1%. Michigan ranks ninth among the fifty states on employer-based coverage. Those who do not have employer-based coverage are typically employed in wholesale/retail trade (19.7%); the service industry (17.1%), or they are self-employed (11.5%).

The majority of Michigan residents without healthcare coverage are adults under age 65, white, living in urban areas, and those in working families. However, residents who are at the greatest risk of being uninsured are young adults (particularly those ages 21-24), minorities, and the working poor (less than 200% of poverty), according to the 2002 Current Population Survey (CPS) estimates.

Approximately 17.8% of Michigan's population lives in 58 rural counties. This population is served by approximately 60 rural hospitals in Michigan according to the 2002 Michigan Department of Community Health Directory. Rural residents (12.4%) had a slightly greater risk for being without health insurance than urban residents (11.7%). However, almost 9 out of 10 residents (87.9%) without health insurance coverage reside in an urban area. Residents of rural Michigan face unique healthcare challenges including long distances between health facilities and difficulty recruiting and retaining medical personnel.

Michigan has several public programs in place that make health insurance coverage accessible to children and families who meet certain criteria, such as having particular health conditions, or

those who fall within income eligibility guidelines. The current public health insurance programs in Michigan are:

- **County, or multi-county-based coverage programs** were established in local communities with state support for low-income uninsured adults who are not eligible for Medicaid. Seventeen of these programs serve approximately 93,995 enrollees.
- **"1/3 Share Programs"** are insurance programs wherein the employee, employer and community funding share the premium in three equal or similar parts. Currently, Kent, Muskegon and Wayne Counties have 1/3 Share Programs in operation, and Washtenaw County is developing such a program.
- **Medicaid** provides healthcare coverage to about 1.3 million eligible Michigan residents.
- **Healthy Kids**, Michigan's Medicaid expansion program for children, provides coverage to children in households at or below 150% of the FPL, and infants and pregnant women are also covered by this program that are living below 185% of the FPL. Between 1998 and 2001, this program enrolled about 115,000 children.
- **MIChild** is a separate State Children's Health Insurance Program (SCHIP) established in 1997. This program covers approximately 33,000 children living in households between 150-200% of the FPL.
- **Michigan's Elder Prescription Insurance Program** (EPIC) helps seniors at or below 200% of FLP who need assistance paying for prescription medications. The current program serves about 15,000 individuals.
- **Legislation on small group health insurance reform** will take effect in January 2004. This will help regulate rates and limit how much insurers can charge small businesses for healthcare coverage.
- **The State Medical Plan (SMP)** reimburses providers giving care to very poor adults (generally 35% of the FPL), many of whom have both medical problems and disabilities, but do not qualify for Medicaid. Michigan has submitted a Health Insurance Flexibility and Accountability Section 1115 waiver to the Centers for Medicaid and Medicare (CMS) to expand this coverage. There are approximately 68,000 persons currently served in this program.
- **Children's Special Healthcare Services** covers children, age 20 or less, who have a qualifying diagnosis for service; more than 2,700 diagnoses are covered. This program serves over 25,000 children. Persons 21 and older with cystic fibrosis or certain blood coagulation disorders may also qualify for services.
- **MOMS** (Maternity Outpatient Medical Services) provides prenatal and postpartum outpatient pregnancy-related services to women at or below 185% of the FPL, who are pregnant or were recently pregnant, and do not qualify for Medicaid.
- **The Breast and Cervical Cancer Control Program** (BCCCP), operating since 1991, provides early identification of women with breast and cervical cancer, follow-up care and treatment. Michigan also implemented Medicaid coverage in 2000 for women diagnosed with cancer whose income is at or below 250% of the FPL.
- **Transitional Medical Assistance** (TMA) is available to families leaving TANF because of increased income. TMA provides 12 months of coverage. TMA-Plus is available to families who have exhausted TMA coverage if their household incomes are below 185% of the FPL; there are income limits for the TMA-Plus program and the family must pay monthly premiums.

- Michigan has ten (as of October 2003) **Community Access Programs** funded by Health Resources and Services Administration (HRSA). These grants are designed to increase healthcare access by eliminating fragmented service delivery, improving efficiencies among safety net providers, and by encouraging greater public sector involvement.

Despite these efforts, a distressing number of Michigan residents are uninsured and underinsured.

MICHIGAN HEALTH STATUS PROFILE

Michigan has long been a leader in public health activities, from policy - such as consolidating related health laws into a Public Health Code - to practice, as in the manufacture of vaccines. Today, Michigan is the first state to appoint a state Surgeon General to address health promotion and disease prevention. However, to improve the health of a population, an understanding of the burden of disease, as expressed through mortality, hospitalizations, or other data is necessary.

Leading Causes of Death

The diseases contributing to the leading causes of death in this country have changed dramatically over the last century thanks to public health measures. In 1900, the first leading cause of death was pneumonia followed by tuberculosis. Diphtheria was the tenth leading cause of death with heart disease, stroke and cancer being the fourth, fifth and eighth leading causes of death, respectively. As of 2001, heart disease ranked first and was responsible for over one-third of all deaths followed by cancer (22.7%) and stroke (6.6%). Now, of diseases that are clearly infectious in origin, only pneumonia (including influenza) continues to remain among the 10 leading causes of death.

Figure 1: Number of Deaths, Ten Leading Causes of Deaths, Michigan 2001
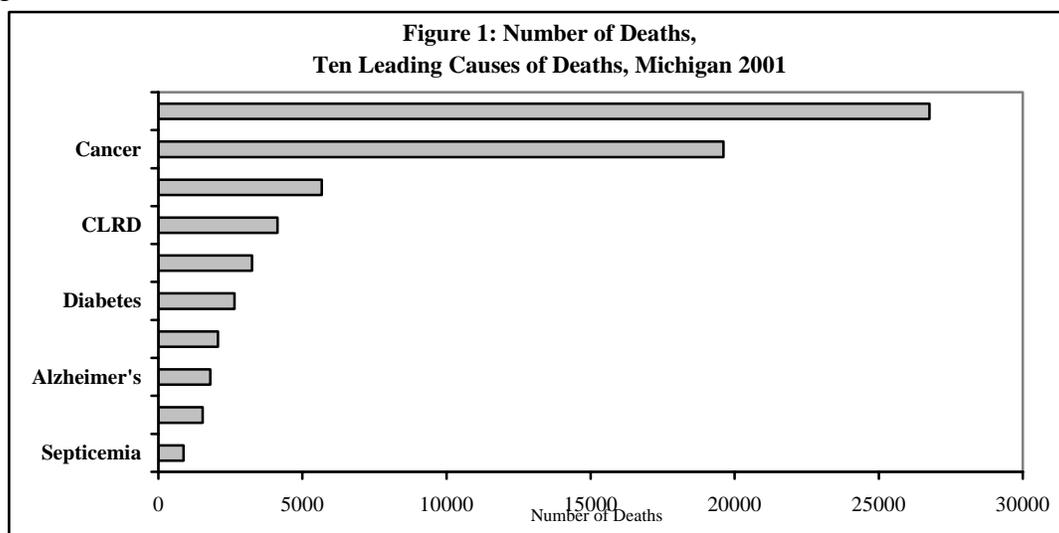
Source: Michigan Resident Death File, Vital Records and Health Data Development Section, MDCH

The leading causes of death in Michigan parallel statistics for the country. Figure 1 indicates that heart disease is the leading cause of death followed by cancer. In Figures 2 and 3, we see that heart disease and cancer remain the leading causes of death for white males and females as well as black males and females. The third leading cause of death for black males, however, is homicide compared to stroke for white males. Unintentional injury is the fifth leading cause of death for both white and black males, with motor vehicle crashes being the most common cause of injury fatalities in this category. Among females, stroke is the third leading cause of death

while diabetes appears as the fifth leading cause of death for white females and the fourth for blacks. **Chronic lower respiratory disease** (CLRD), which may be related to smoking, is the fourth leading cause of death for both white males and females. These variations in leading causes of death clearly indicate the need for multi-faceted health promotion programs.

Figure 2: The Five Leading Causes of Death Among Males by Race, Michigan, 2001

Source: Michigan Resident Death Files, Vital Records and Health Data Development Section, MDCH

Figure 3: The Five Leading Causes of Death Among Females by Race, Michigan, 2001

Source: Michigan Resident Death Files, Vital Records and Health Data Development Section, MDCH
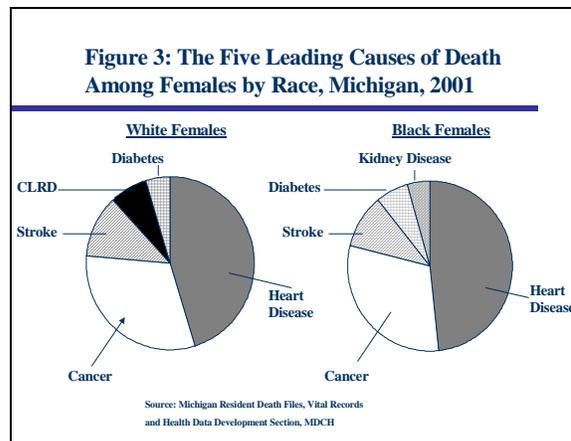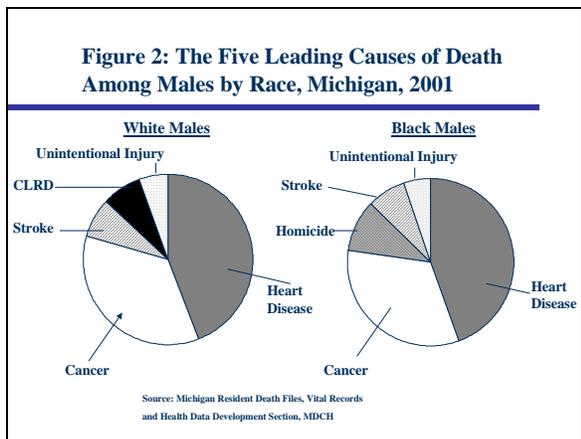
Life Expectancy

As in the U.S., **life expectancy** in Michigan has been rising among males and females and among whites and blacks (see Figure 4). White males born in Michigan in 1950 could expect to live, on average, to age 66.2, white females to age 71.9, black males to age 60.4 and black females to age 63.4. As of 2001, the life expectancy for white males had risen to 74.7 years, for white females to 79.9 years, for black males to 67.3 years and black females to 74.2 years. Whites continue to have a greater life expectancy than blacks. Over this period, however, black females gained a decade in life expectancy and now would be expected to live, on average, as long as white males. Black males had the lowest gain in life expectancy (6.9 years) and continue to have the lowest life expectancy of any of the groups.

Figure 4: Life Expectancy Increases by Race and Sex, Michigan, 1959 - 2001

Source: Michigan Resident Death Files, Vital Records and Health Data Development Section, MDCH
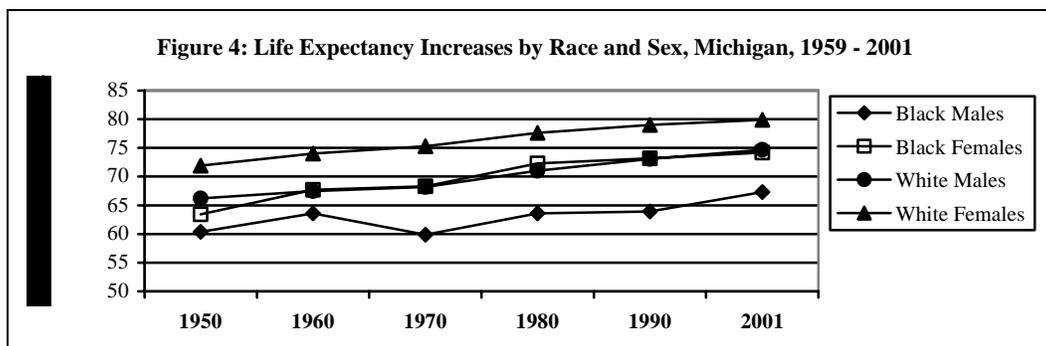
Leading Causes of Premature Mortality

Although life expectancy is an important measure in determining if we are making progress in promoting population health, premature mortality is an equally important indicator. The **years of potential life lost (YPLL)** measure gives us an idea of the impact of early death (any death before age 75) on society. Premature deaths have been demonstrated to be associated with lifestyle behaviors such as cigarette smoking, drinking alcoholic beverages, or leading a sedentary lifestyle. More recently, researchers have argued that disparities in premature death may also be related to factors such as lack of social support or chronic stress. Based on deaths

occurring in 2001, the leading causes of premature death in Michigan were: cancer, heart disease, unintentional injury (includes motor vehicle accidents), deaths in the **perinatal period**, homicide, suicide, stroke, **congenital anomalies**, liver disease and chronic lower respiratory disease.

The leading causes of premature mortality vary by race and gender. Cancer was the leading cause of premature mortality for white males and white and black females. Heart disease was the second leading cause of early mortality for these groups. Among black males, heart disease was the leading cause of premature death followed by homicide. The leading causes of premature death by percent of those deaths can be seen in Table 1.

Table 1: Leading Causes of Premature Deaths, by Percent by Race and Gender, 2001								
Rank	White Males		White Females		Black Males		Black Females	
1	Cancer	20.4	Cancer	31.6	Heart	15.4	Cancer	18.5
2	Heart	20.2	Heart	14.3	Homicide	15.4	Heart	15.4
3	Un. Injury	15.7	Un. Injury	10.2	Cancer	11.2	Perinatal	11.6
4	Suicide	6.5	Perinatal	5.8	Perinatal	11.2	Un. Injury	7.7
5	Perinatal	4.4	Cong. Anomaly	3.7	Un. Injury	10.5	Homicide	4.9
6	Liver	2.9	CLRD	3.6	HIV	3.4	Stroke	3.9
7	Cong. Anomaly	2.5	Stroke	3.2	Stroke	2.7	Diabetes	2.7
8	Stroke	2.4	Diabetes	2.5	Suicide	2.4	Cong. Anomaly	2.5
9	CLRD	2.2	Suicide	2.5	Liver	2.3	Liver	2.2
10	Diabetes	2.1	Liver	2.1	Pneu/Flu	1.8	Pneu/Flu	2.0

Michigan's Behavioral Risk Factor Surveillance Survey captures some of the risk factors leading to premature death or disability. Results of the 2002 survey indicate that 24.1% of Michigan adults were current cigarette smokers (white: 23.9, black: 25.3), 25.2% were obese (whites: 23.7, blacks 34.5), and 24.3% engaged in no physical activity (whites: 22.7; blacks: 32.2). Other self-reported behaviors that could be associated with premature death were binge drinking (overall: 16.8%; whites: 17.7; blacks 11.5), not always using a seatbelt when in a car (overall: 16.4%; whites: 16.2; blacks: 20.0), and having a loaded and unlocked gun the home (overall: 3.3%; whites: 3.2; blacks: 4.7)

Figure 5: Behavioral Risk Factor Survey 1997-2001
Reported Disparities by Race, Michigan
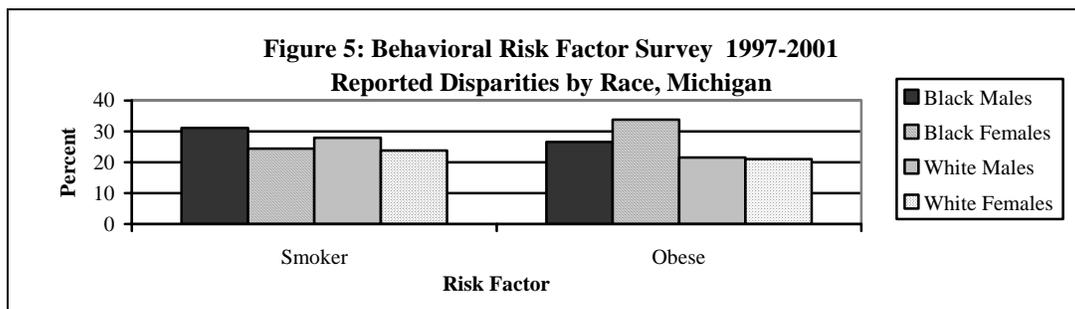
Preventable Hospitalizations

To assess and monitor population health, other health outcomes such as hospitalizations or disability are important to examine. Preventable hospitalizations are those hospitalizations for conditions in which timely and effective ambulatory care could prevent the onset of an illness, promote better control of an acute episode or improve management of a chronic condition. By definition, the costs of these hospitalizations are avoidable through prevention. In 2000, heart

and lung problems were among the four leading causes of preventable hospitalization among Michigan residents of all age groups (i.e. congestive heart failure, bacterial pneumonia, CLRD, asthma). Other leading causes were: kidney or urinary tract infections, diabetes, dehydration, cellulitis, convulsions and angina. Among children aged 18 or younger, asthma was the leading cause of preventable hospitalization followed by bacterial pneumonia, while among adults aged 18 to 64, bacterial pneumonia and asthma were the first and third leading causes, respectively. Of Michigan residents aged 65 and over, congestive heart failure was the leading cause followed by bacterial pneumonia.

Disabilities
Many conditions of public health interest may not be associated with mortality or frequent hospitalizations, but may cause limitations in day-to-day living and be related to significant societal costs. The 2000 census included estimates on disability based on questions about sensory, physical, mental, or self-care disabilities related to conditions of six or more months. Based on these questions, approximately 19.3% of 257.2 million people aged five and older in the U.S. and 18.7% of 9.9 million Michigan residents have some type of disability. Among Michigan residents, 3.5% have a sensory disability (vision or hearing impaired), 8.3% have a physical disability, 5.2% have a cognitive disability (e.g., learning, remembering, concentrating), and 2.7% have difficulty with self-care. Of those persons aged 16 and older, eight percent have trouble going outside of the home and of those between the ages of 16 and 64, 10.7% have an employment disability.

Census 2000 indicated that disability rates varied by race and ethnicity with the highest rates reported among blacks and those who were American Indian or Alaskan Native. Detroit ranked 4th in the proportion of people aged five and older with disabilities among places with 100,000 people or more. In Detroit, it is estimated that over one in four persons (28.3%) have some type of disability, meaning there are 244,893 people with a disability residing in Detroit. As in Detroit, most of the areas with a higher **prevalence** of disability were older industrialized areas and had higher concentrations of minority groups exhibiting higher rates of disability.

Healthcare System in Michigan
The Michigan Department of Community Health (MDCH) is responsible for health policy and management of the state's publicly-funded health service systems. MDCH and 45 local health departments deliver public health services in Michigan. Serving all 83 of Michigan's counties, these local providers assess health needs, promote and protect health, engage in disease prevention and planning activities, and assure access to appropriate care for citizens.

The Office of Services to the Aging (OSA) administers federal and state aging programs and services to Michigan's 1.6 million older residents. With the Michigan Commission on Services to the Aging, OSA oversees 16 Area Agencies on Aging that partner with more than 1,270 service providers. In 2002, the aging network spent $91 million serving older adults through more than 30 access or caregiver contacts, and community-based and in-home services.

Public mental health services in Michigan are managed through contracts with 48 county Community Mental Health Services Programs (CMHSPs). Using managed care principles, CMHSPs provide services to children and adults with a mental illness or developmental disability who are either enrolled in the Medicaid program or are experiencing an illness or disability serious enough to qualify them as a priority population, as defined by the Michigan

Mental Health Code. CMHSPs are also responsible for managing substance abuse services to Medicaid beneficiaries. Substance abuse services are provided through 15 coordinating agencies located throughout the state.

In 2001, CMHSPs served about 235,600 people; among them, 41,400 children with serious emotional disturbances and 33,500 persons with developmental disabilities received services. State-appropriated funding for 2001 was approximately $2.02 billion, which includes $1.52 billion in state and federal funds for the Medicaid specialty services program and $318 million in state GF/GP funding for non-Medicaid, priority populations. Counties also contribute local funds to support these services.

Nearly one-third of Michigan's non-profit **acute care hospitals** are located in rural areas of the state. In Michigan, the Department of Community Health regulates health facilities.

In 2002, Michigan hospitals provided $853 million in uncompensated care to patients. According to the Michigan Health & Hospital Association, 42% of the uninsured in Michigan have used the emergency room as their source of care or have no regular source of care.

Michigan's healthcare safety net is augmented by **Federally-Qualified Health Centers (FQHC's), and FQHC Look-Alikes**, which are essential partners in delivering primary health care services to high-risk and special-needs populations. These centers typically serve 350,000 persons a year who are either uninsured or have inadequate coverage. More than 40 free clinics are in operation and rely on community-based donations and healthcare professionals volunteer time to remain open. **School-based/linked health centers** serve more than 100,000 children and adolescents, and in some cases are the only sources of easily accessible medical care for these individuals.

Additional Resources:
- U.S. Department of Labor, Bureau of Labor Statistics. Local Area Unemployment Statistics. Retrieved August 2003, from http://stats.bls.gov/lau/.
- Population Reference Bureau. U.S. Census Bureau data analysis for The Annie E. Casey Foundation.
- Bureau of Census, Economics and Statistics Administration, U.S. Department of Commerce, Statistical abstract of the United States 2001: The National Data Book,.
- Michigan Department of Community Health website. www.michigan.gov/mdch.
- Vital Records & Health Data Development Section, Michigan Department of Community Health.
- Employee Benefit Research Institute. (March 2003). *Current Population Survey*: *Characteristics of the Uninsured.* (Select Health Insurance Coverage in Michigan Data Book). Washington, DC.
- Michigan Primary Care Association. (2003). Office Cooperative Agreement Semi-Annual Report, (pp. 2-3).
- Lantz P.M., House J.S., Lepkowski J.M., Williams D.R., Mero R.P., Chen J. (1998). Socioeconomic Factors, Health Behaviors and Mortality: Results from a Nationally Representative Prospective Study of U.S. Adults. Journal of the American Medical Association, 279 (21), 1703-1708.
- Waldrop, J and Stern S. M. (March 2003) Disability Status, 2000: Census 2000 Brief. U.S. Department of Commerce, Economics and Statistics Administration. U.S. Census Bureau.

Overview of Chronic Disease

By 2011, 13% of the U.S. population will be 65 years or older, including the first of the baby boomers. In Michigan, 14% of our state's population is *already* 65 years or older. By 2030, 20% of the U.S. population is expected to be at least 65. In Michigan, this proportion is expected to be nearly 25% of the population.

In 2000, 125 million Americans (one half of all U.S. residents) were living with at least one chronic disease or disability. Between the ages of 45 and 64, sixty-two percent of this population currently has at least one of these, and 35% have two or more chronic conditions. After age 65, the proportion increases to 84% with at least one, and 62% with two or more chronic diseases or disabilities.

The impact of our aging populations will be enormous on our healthcare and support systems. Currently, 78% of all U.S. healthcare spending is for people with chronic conditions. Seventy-six percent of hospital admissions are attributable to people with chronic conditions, as are 88% of all prescriptions filled and 72% of physician visits. And two-thirds of Medicare spending is for people with five or more chronic conditions.

It would be difficult to overstate the importance of disease prevention and early detection and control efforts for Michigan and the nation. Current spending on healthcare is a major concern for this country, but today's spending soon will be dwarfed by the amounts needed in another 10 to 20 years if our residents continue to develop chronic diseases and disabilities at current rates. The goal of chronic disease prevention and control efforts is to improve the health of all of Michigan populations through preventing chronic diseases or delaying their onset until very late in life through increased physical activity, good nutrition, tobacco cessation, alcohol in moderation, and positive mental health. For diseases where no known prevention strategies exist, early detection and appropriate management of the disease can reduce the burden of complications that often accompany these diseases and their associated healthcare costs.

Overview of Breast Cancer

Breast cancer is the most frequently diagnosed cancer in Michigan women. Each year, almost 7,000 women in Michigan are diagnosed with breast cancer. Over 1,400 Michigan women die yearly due to breast cancer, the second leading cause of cancer **mortality** in women after lung cancer. Breast cancer is associated with the second highest cost in years of life lost, causing an average loss of 18.4 years of life per death and a total of 27,116 person-years of life lost due to cancer in 2001.

Although every woman is at risk of developing breast cancer, several factors have been shown to increase this risk. These factors include: increasing age; a personal history of breast cancer; a family history of breast cancer (especially pre-menopausal onset) in a mother, a sister, or other multiple relatives; never giving birth or having a first child after the age of 30; and a long menstrual history. Other than age, however, approximately 70% of women diagnosed with breast cancer have no known risk factors.

Breast cancer, while not preventable, is responsive to effective treatment when tumors can be found at the earliest stages through regular screening and early detection. Finding breast cancer at an early stage can reduce mortality and improve survival rates. A localized breast cancer diagnosis has a 97% survival rate (compared to a 23% survival rate for late-stage diagnoses), reducing the significant burden to women and society. The primary indicators of successful public health interventions include reductions in breast cancer mortality rates, increasing rates of regular screening for breast cancer in all Michigan women through mammography and clinical breast exams, reduction in the proportion of women diagnosed with late-stage breast cancer, and a narrowing of the gap that currently exists between black and white women for earlier breast cancer stage at diagnosis and therefore more favorable treatment outcomes.

How is Michigan doing?

Breast cancer incidence rates have begun to show very slight declines since 1995. In 1990, the overall breast cancer incidence rate was 140.9/100,000 women. In 2000, the breast cancer incidence rate had fallen to 129.9. In 2000, the incidence of new breast cancer diagnoses in black women was lower than that of white women at a rate of 111.1/100,000 black women compared to an incidence rate of 129.5/100,000 women.

In 1990, the overall mortality rate from breast cancer for Michigan women was 34.0/100,000 women. By 2001, the rate decreased to 26.7/100,000 women. Despite lower incidence, black women had a significantly higher breast cancer mortality rate (36.3) than white women (25.4) in 2001. This is likely to be due in part to fewer black women being diagnosed at localized stages (51.1%) than white women (62.9%). However, the trend towards early stage diagnosis is improving greatly in Michigan. In 1990, 52.3% of breast cancers were diagnosed at a localized, more survivable stage. By 2000, 61.1% of breast cancers were diagnosed at localized stage.

Regular screening for breast cancer should be a priority for Michigan women. In 2002, however, only 54.2% of all women ages 40 and older received screening for breast cancer according to recommended ages and intervals (i.e., they reported having had a mammogram and a clinical breast exam within the past year.) Over 92% of Michigan women report *ever* having had a mammogram but only 61% reported having had a mammogram in the past year. Black women

report lower yearly breast screening rates, 48.5% compared to almost 58 % for white women. Low-income women also report infrequent regular screening.

How does Michigan compare with the U.S.?

Table 2: Breast Cancer Incidence and Mortality Rates			
	All women	*White women*	*Black women*
US Incidence (2000)	135.0	140.8	121.7
US Mortality (2001)	26.7	26.3	34.6

Note: Screening rates calculated by Michigan BRFSS are not comparable to national rates due to differing formulas for calculation.

Healthy People 2010 goal:

3-3.   Reduce the breast cancer death rate.

Target: 22.3 deaths per 100,000 females.

U.S. Baseline: 27.9 breast cancer deaths per 100,000 females in 1998 (age-adjusted to year 2000 standard population).

Target setting method: 20 percent improvement.

U.S. Data Source: National Vital Statistics System (NVSS), CDC, NCHS

How are different populations affected?
Black women, while having an overall lower incidence rate of breast cancer than white women, have a significantly higher mortality rate from breast cancer. Black women are routinely diagnosed at later stages, with 42.3% of black women diagnosed at **regional** or **distant stages** in 2000, compared to 29% of white women. Therefore, the five-year survival rate for black women is 73.5% compared to 88% for white women. Women most likely to die from breast cancer are those least likely to get mammograms and clinical breast exams, especially older women, minority women, and low-income women.

What other information is important to know?
All women age 40 and older, regardless of income, should be screened annually for breast cancer. Yearly screenings and appropriate medical follow-up of any abnormalities could prevent one-third or more of the deaths from breast cancer. The recommended schedule for breast cancer screening is women aged 40 and older should receive a clinical breast exam and mammographic screening exam every year.

Additional Resources:
- Michigan Department of Community Health. (1985 – 2000) Cancer Burden in Michigan: Selected Statistics.
- Michigan Department of Community Health. (2002). Facts about Breast Cancer.
- Michigan Department of Community Health. (1990-2000). Cancer Registry.
- Feuer, EJ et Al. (1993). The lifetime risk of developing breast cancer. JNCI, 85 (11), 892-897.
- U.S. Department of Labor, Bureau of Labor Statistics. Current Population Survey, 2002 estimates. http://www.bls.gov/cps/home.htm
- Vital Records & Health Data Development Section, Michigan Department of Community Health. www.michigan.gov/mdch.
- Michigan Department of Community Health. (2000). Michigan Behavioral Risk Factor Surveillance Survey.
- National Cancer Institute. (1975-2000). Surveillance, Epidemiology, and End Results (SEER) Cancer Statistics Review. http://www.seer.cancer.gov/csr/1975_2000/results_merged/sect_02_all_sites.pdf.

Cervical Cancer

Overview of Cervical Cancer

Each year, more than 400 women in Michigan are diagnosed with invasive cervical cancer. Over 130 Michigan women die yearly due to cervical cancer. Although cervical cancer is responsible for 3,497 **person-years of life lost**, it causes the greatest number of person years of life lost per cancer death in Michigan, averaging 26.5 years per person.

The most important risk factor for cervical cancer is infection with certain strains of Human Papillomavirus (HPV), the most common sexually transmitted disease. Some HPV strains cause cancer; other strains cause genital warts. Condoms can reduce but do not eliminate the risk of transmission of HPV to uninfected partners. Women who have initiated sexual activity at an early age and women who have had many sexual partners are at an increased risk for HPV infection. Additional contributing risk factors include smoking and infection with HIV.

Cervical cancer is a preventable cancer. It is responsive to public health interventions and can be prevented with increased education that both encourages screening and provides information about Human Papillomavirus (HPV) infection. **Mortality** from cervical cancer is also preventable through regular screening (Pap smears) and early detection of precancerous conditions.

How is Michigan doing?

Currently, all prevention efforts focus on regular screening leading to early detection. Overall, the cervical cancer incidence rate for Michigan women has declined from 14.1 women per 100,000 in 1990 to 8.5 women per 100,000 in 2000. However, a discrepancy between the rates per 100,000 population for black women (10.6) and for white women (7.8) still existed in 2000.

In the past 11 years, the mortality rate for cervical cancer in Michigan women has declined from a rate of 3.6/100,000 women to 2.5/100,000 in 2001. However, the mortality rate from cervical cancer for black women (4.6/100,000) is double that of white women (2.3/100,000).

While most cervical cancers in Michigan are diagnosed in early stages (93.6%), with regular screening, this percentage could easily be 100%. Black women continue to lag behind white women in the percent diagnosed at early stages, 90.5% compared to 93.1%.

Over 96% of women 18 years or older report having had a Pap test during their lifetime. That percentage falls to 85.2% when asked if it had been received in the past three years. Both rates are higher than the national rates. Low income and less educated women also report significantly lower rates of screening. It appears that the highest rates of screening for cervical cancer occur in women of childbearing age and screening decreases significantly with aging.

How does Michigan compare with the U.S.?

In 2001, Michigan ranked 32nd in the nation in cervical cancer mortality.

Table 3: Cervical Cancer Incidence and Mortality Rates			
	All women	*White women*	*Black women*
US Incidence	7.6	7.2	10.1
US Mortality	2.8	2.5	5.5

Healthy People 2010 goals:

| **3-4.** | **Reduce the death rate from cancer of the uterine cervix** |

Target: 2.0 deaths per 100,000 females.

U.S. Baseline: 3.0 cervical cancer deaths per 100,000 females in 1998 (age-adjusted to year 2000 standard population).

Target setting method: Better than the best.

U.S. Data Source: National Vital Statistics System (NVSS), CDC, NCHS.

3-11.   **Increase the proportion of women who receive a Pap test.**

Target and U.S. Baseline:

Objective	Increase in Pap Testing	1998 Baseline*	2010 Target
		Percent	
3-11a.	Women age 18 years and older who have ever received a Pap test	92	97
3-11b.	Women aged 18 years and older who received a pap test within the preceding 3 years	79	90

 *Age adjusted to the year 2000 standard population. Includes women without a uterine cervix.

Target setting method: Better than the best.

U.S. Data Source: National Health Interview Survey (NHIS), CDC, NCHS.

How are different populations affected?

Black women have a higher overall incidence rate of cervical cancer than white women, a rate of 10.6/100,000 for black women compared to a rate of 7.8 for white women. As noted above, black women are more likely to die from cervical cancer. Black women have a 61% five-year survival rate compared to a five-year survival rate of 72.9% for white women. Women most likely to die from cervical cancer are those least likely to get Pap smears, especially older women, minority women, and low-income women.

What other information is important to know?

All women, regardless of income, should be screened annually for cervical cancer throughout their lives. Yearly screenings and appropriate medical follow-up of any abnormalities could prevent virtually all cervical cancer deaths. The screening schedule for cervical cancer recommended for women age 21 years and older includes a Pap test and pelvic examination every year. After a woman has had three or more consecutive satisfactory normal annual examinations, the Pap test may be performed less frequently at the discretion of her provider.

Additional Resources:
- Michigan Department of Community Health. (1985 – 2000). Cancer Burden in Michigan, Selected Statistics.
- Michigan Department of Community Health. (1990-2000). Cancer Registry.
- Michigan Department of Community Health. (2002) Facts about Cervical Cancer.
- Vital Records & Health Data Development Section, Michigan Department of Community Health. www.michigan.gov/mdch.
- Michigan Department of Community Health. (2000). Michigan Behavioral Risk Factor Surveillance Survey.
- American Cancer Society.

Colorectal Cancer

Overview of Colorectal Cancer

Colorectal cancer is the second leading cause of cancer-related death in Michigan, with only lung cancer taking the lives of more men and women. Colorectal cancer patients were attributed with the highest average length of hospital stay from 1991 through 2000 and colorectal cancer caused 26,688 **person-years of life lost** in 2001, an average of 14.1 years of life.

Factors that increase the risk of developing colorectal cancer include: increasing age; a personal history of colon cancer, colon polyps, or inflammatory bowel disease; a family history of colorectal cancer; being Jewish of Eastern European descent; a diet high in animal fats or low in fiber; not being physically active; **obesity**; having diabetes; smoking; and heavy use of alcohol. The two most common forms of hereditary colorectal cancer are familial adenomatous polyposis (many colonic polyps) and hereditary non-polyposis colorectal cancer (few, if any polyps). Inherited mutations in any of the genes contributing to these conditions could put an individual at a high risk of developing colorectal cancer. In some cases, these mutations can be associated with an increased risk for other cancers. Together, these account for only about five percent of all cases of colon cancer. The majority of cases, known as 'sporadic' cases, occur in average risk individuals.

Detection and removal of pre-cancerous polyps and detection and treatment of disease in its early stages will reduce deaths from colorectal cancer. The primary indicators of successful public health interventions include reduction in the colorectal cancer mortality rate, reduction in the proportion of individuals diagnosed with late-stage colorectal cancer, narrowing the gap between blacks and whites for colorectal cancer stage at diagnosis, and increasing the proportion of adults who receive a colorectal cancer screening exam.

How is Michigan doing?

In 2002, about 54% of Michigan men and women 50 years and older had ever used a home fecal occult blood test to determine the presence of blood in their stools. Women are somewhat more likely than men to have used the test and American Indians, Hispanics, and Arab-Americans are less likely than blacks or whites to have used the test. Nearly 61% of Michigan men and women 50 years and older have had a **sigmoidoscopy** or **colonoscopy** at least once during their lifetime, a rate that is more than 10% higher than the national rate of ever having had either test. Racial and ethnic minorities are less likely than whites to have ever had at least one of these tests. Only 31% of Michigan men and women 50 years of age or older have had any appropriately timed colorectal cancer screening as indicated by the Michigan Cancer Consortium recommendations.

Over the past ten years, colorectal cancer incidence has decreased in Michigan. In 2000, the colorectal cancer incidence rate was 53.3/100,000 population, with 2,585 men and 2,556 women diagnosed with invasive colorectal cancer. The colorectal cancer mortality rate has remained unchanged over the past ten years; during 2001, the mortality rate was 19.7/100,000, and 931 men and 968 women died from colorectal cancer.

Men are more likely than women to develop colorectal cancer, but more women die of the cancer; blacks have higher colorectal cancer incidence and mortality rates than people of other racial groups.

Since the early 1990s, there has been a slight increase in the proportion of colorectal cancer cases diagnosed at a local 'treatable' stage (confined to the colon or rectum). In Michigan, 37.7% of invasive colorectal cancer cases diagnosed during 2000 were found at a **local stage**. This includes 37.5% of newly diagnosed cases in women and 37.9% of newly diagnosed cases in men. Of individuals diagnosed with colorectal cancer at a local stage, 90.1% will survive at least five years. This is compared with a five-year survival rate of 65.5% when diagnosed at a regional stage (cancer has spread to surrounding tissues) and 9.2% when diagnosed at a distant stage (cancer has **metastasized**). Blacks diagnosed with colorectal cancer at any stage are less likely than other races to survive five years; the five-year survival rate for blacks is 15.2% lower than for whites.

How does Michigan compare with U.S.?

Michigan ranks 27th in the nation in colorectal cancer mortality with a rate of 19.7/100,000 in 2001 compared to the U.S. average rate of 20.8/100,000 in 2000. In 2000, Michigan had an incidence of colorectal cancer of 53.3/100,000 similar to the U.S. rate of 53.1/100,000.

Michigan is fifth highest in the country for persons age 50+ ever having had a sigmoidoscopy or colonoscopy, 55.2% compared to U.S. average of 46.3%.

Healthy People 2010 goal:

3-5.   Reduce colorectal cancer death rate

Target: 13.9 deaths per 100,000.

U.S. Baseline: 21.2 colorectal cancer deaths per 100,000 population in 1998 (age-adjusted to year 2000 standard population).

Target setting method: 34 percent improvement.

U.S. Data Source: National Vital Statistics System (NVSS), CDC, NHCS.

3-12.   Increase the proportion of adults who receive a colorectal screening examination

Target and U.S. Baseline:

Objective	Increase in Colorectal Screening	1998 Baseline*	2010 Target
		Percent	
3-12a.	Adults 50+ who have received fecal occult blood test (FOBT) within the preceding two years	35%	50%
3-12b.	Adults 50+ who have ever had a sigmoidoscopy	37%	50%

 *Age-adjusted to the 2000 standard

Target setting method: Better than the best.

U.S. Data Source: National Health Interview Survey (NHIS), CDC, NCHS.

How are different populations affected?

As indicated in previous sections, colorectal cancer incidence, mortality, stage at diagnosis, and five-year survival rates vary by gender, race and ethnicity.

What other information is important to know?

Adult men and women should be screened for colorectal cancer according to the recommendations of the Michigan Cancer Consortium:

Men and women 50 years of age and older who are not at moderate or high-risk are encouraged to follow a screening schedule that consists of:

1) Fecal occult blood testing (tests blood in the stool) each year and flexible sigmoidoscopy (procedure examining lower portion of the colon) with digital rectal exam every five years or;
2) Double-contrast barium enema (X-ray of colon) every 5 -10 years or;
3) Colonoscopy (procedure to examine the entire colon with digital rectal exam every 10 years.

Men and women considered to have additional risk factors are encouraged to undergo screening at a younger age and undergo screening more frequently.

Additional Resources:

- Michigan Department of Community Health. (1985 – 2000). Cancer Burden in Michigan: Selected Statistics.
- Michigan Department of Community Health. (1990-2000). Cancer Registry.
- Michigan Department of Community Health. (2001) Division for Vital Records and Health Statistics.
- American Cancer Society.
- Michigan Department of Community Health (2001-2002). Cancer Behavioral Risk Factor Survey.
- Centers for Disease Control. (2001). U.S. Behavioral Risk Factor Surveillance Survey.
- National Cancer Institute. (1975-2000). Surveillance, Epidemiology, and End Results (SEER) Cancer Statistics Review. http://www.seer.cancer.gov/csr/1975_2000/results_merged/sect_02_all_sites.pdf.
- Michigan Department of Community Health. (2000). Michigan Behavioral Risk Factor Surveillance Survey.
- Vital Records & Health Data Development Section, Michigan Department of Community Health. www.michigan.gov/mdch.
- Michigan Cancer Consortium. (2002). Recommendations for Colorectal Cancer Early Detection.

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Prostate Cancer

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Overview of Prostate Cancer

Prostate cancer is the most commonly diagnosed form of cancer (other than skin cancer) in Michigan men with 8,226 men diagnosed in 2000; it is the 2nd leading cause of cancer mortality with 1,107 men dying of the disease in 2001 in Michigan. In 1999, Michigan had a higher incidence of prostate cancer than any other state; only the District of Columbia was higher.

Factors that increase the risk of developing and/or dying from prostate cancer are:
- Increasing age
- Family history of prostate cancer; men who have a father or brother with prostate cancer have a two-to three-fold increased risk of developing the disease. A recent study suggests that men with brother(s) with prostate cancer may be a greater risk than men with an affected father.
- African ancestry

Public health interventions for prostate cancer prevention are not available at this time. There is no scientific agreement on the benefits of screening for prostate cancer, and screening is not recommended by MDCH because it is unclear if screening and treatment do more good than harm. Therefore, at this time the only appropriate public health intervention is to facilitate informed decision-making. Clinical trials are currently under way to assess the benefits and risks of screening and treatments.

How is Michigan doing?

Prostate cancer incidence has dramatically increased in Michigan, as it has throughout the US; the increase is attributed to the introduction of screening with the **Prostate Specific Antigen (PSA)** test in 1987 and its more widespread use since the American Cancer Society endorsed routine screening in 1997. In 1985 the incidence was113/100,000; the incidence peaked at 270 in 1992 and was 199 in 2000. The stage at diagnosis has markedly changed: percent of cases diagnosed at a localized stage was 57.6% in 1985, 60.6% in 1993 and 76.4% in 2000; regional stage was 8.3% in 1985, 13.2% in 1993, and 8.0% in 2000; distant stage was 15.7% in 1985, 5.2% in 1993, and 2.4% in 2000. The mortality rate had been increasing, peaking at 43/100,000 in 1993; since that time it has decreased to 33 in 2001.

The initial presenting serum PSA level (*i*PSA) is another marker of how advanced the disease is at the time of diagnosis. A University of Michigan study reviewed *i*PSAs in black and white men. It showed an overall decline in *i*PSA in both groups over time. Racial differences in *i*PSA among men diagnosed in the PSA era (1997-2001) are less pronounced compared to men diagnosed in an earlier time period (1990-1996). Blacks were an average of 2.5 and 3.1 years younger at the time of diagnosis in the earlier and later cohorts respectively. In Michigan in 2001 the total person-years of life lost to prostate cancer deaths was 10,311; the average years of life lost per prostate cancer death was 9.3 years overall, 9.5 years for blacks, and 9.1 years for whites.

The reasons for the decline in prostate cancer mortality rate are uncertain. Widespread screening is assumed by many to be the critical factor, however, this has not been scientifically established; ongoing research will be able to answer this query within the next 5-10 years. Mortality rate changes typically require 15-20 years to be observed following an intervention such as PSA

screening. Other possible reasons for the decline are **attribution bias** and improvements in treatment **modalities**, particularly those introduced just prior to PSA testing as the mortality reductions would be expected to be observed well into the future. This applies mainly to treatment of more advanced cancers as the **efficacy** of various types of treatment for clinically localized prostate cancer, which is the type of prostate cancer usually detected by screening, is largely unknown.

How does Michigan compare with the U.S.?

Table 2: Prostate Cancer Incidence and Mortality Rates, from Cancer Burden in Michigan: Selected Statistics (1985-2001) and SEER 2000			
	All men	White men	Black men
Michigan Incidence (2000)	198.9	170.3	266.6
US Incidence	176.9	170.6	278.1
Michigan Mortality (2001)	32.6	29.7	60.2
US Mortality	30.6	27.9	69.2

Healthy People 2010 goal:

3-7.   Reduce prostate cancer death rate

Target: 28.8 deaths per 100,000 males.

U.S. Baseline: 32.0 prostate cancer deaths per 100,000 males in 1998 (age-adjusted to year 2000 standard population).

Target setting method: 10 percent improvement.

U.S. Data Source: National Vital Statistics System (NVSS), CDC, NHCS.

Note that these goals were set in the absence of proven prevention or treatment strategies.

How are different populations affected?
Elderly men are at significantly higher risk for prostate cancer than are younger men: for men 40-49 years old incidence is 28.8 and mortality is 0.8/100,000; for men 50-64 years old incidence is 360.0 and mortality is 11.0; for men 65 years old and over incidence is 1,110.4 and mortality is 207.6.

Black men are affected disproportionately by prostate cancer. The incidence of prostate cancer among black men in Michigan is 1.6 times that of white men; the mortality is 2.0 times that of white men. Black men are also diagnosed with prostate cancer at an earlier age. Epidemiologic studies show that men of African heritage have a high incidence of prostate cancer across the Americas; a report showed that prostate cancer incidence in Nigerian men is similar to that seen in black men in the U.S. These facts support a genetic predisposition to developing clinical prostate cancer as a factor in the higher incidence and mortality of black men compared to white men.

Nationally Asian Americans, Hispanic Americans, and Native Americans have a lower incidence of prostate cancer than blacks and whites; data on these groups is not available at the state level.

What other information is important to know?
Unlike other cancers, many prostate cancers grow slowly, never causing problems or affecting how long a man lives; however, some prostate cancers can become a serious health threat, growing quickly and spreading beyond the prostate gland to other parts of the body, and are

sometimes fatal. At this time, we have no way of distinguishing between the early stages of these two types of cancer. Although screening with the PSA and digital rectal exam can detect prostate cancer at an earlier stage, at this time we do not have definitive evidence that screening and resultant early treatment of prostate cancer decrease prostate cancer mortality. Research is ongoing to discover ways of distinguishing **virulent** from **indolent** forms of cancer. At this time universal screening for prostate cancer is not recommended by the Centers for Disease Control and Prevention (CDC), the Michigan Department of Community Health or the US Preventive Services Task Force; however, it is recommended by the American Cancer Society and the American Urological Association.

Because of these uncertainties, screening for prostate cancer must be a result of shared decision making between the man and his healthcare provider. Shared decision-making goes beyond the physician or other healthcare provider simply informing the patient. It encourages the patient to actively participate in the decision, emphasizing the importance of the patient's values and preferences in making that decision.

The MDCH Cancer section and the Michigan Cancer Consortium is focusing on developing and distributing high quality information to empower men to more effectively decide whether to be tested and, if early prostate cancer is found, to decide among treatment options, including watchful waiting.

Additional Resources:

- Michigan Department of Community Health. (1985 – 2000). Cancer Burden in Michigan: Selected Statistics.
- Vital Records & Health Data Development Section, Michigan Department of Community Health. www.michigan.gov/mdch.
- Freedland SJ, Aronson WJ, Kane CJ, et al. (2004). Impact of Obesity on Biochemical Control after Radical Prostatectomy for Clinically Localized Prostate Cancer: A Report by the Shared Equal Access Regional Cancer Hospital Database Study Group. Journal of Clinical Oncology, 22 (3): 1-7.
- Amling CL, Riffenburgh RH, Leon S, et al. (2004). Pathologic Variables and Recurrence Rates as Related to Obesity and Race in Men With Prostate Cancer Undergoing Radical Prostatectomy. Journal of Clinical Oncology, 22 (3): 1-6.
- Pan C, Lee J, Chan J, et al. (2003). The Association between Presentation PSA and Race in two Sequential Time Periods in Prostate Cancer Patients seen at a University Hospital and its Community Affiliates. *International Journal of Radiation Oncology Biology Physics,* 57 (5): 1292-1296.
- Watkins-Bruner D, Moore D, Parlanti A, et al. (2003). Relative risk of prostate cancer for men with affected relatives: systematic review and meta-analysis. *International Journal of Cancer,* 107: 797-803.

Heart Disease

Overview of Heart Disease

Heart disease is the leading cause of mortality in Michigan and in the nation. The largest cause of heart disease deaths is ischemic heart disease (IHD), or coronary heart disease, and it is caused by diminished blood supply to the heart and surrounding tissue. IHD usually results in a heart attack. It can often be prevented with changes in health habits such as not smoking, improving dietary habits or increasing physical activity. Risk factors such as elevated cholesterol, diabetes, high blood pressure and chronic inflammation are contributors to the development of ischemic blood vessel changes, and these risk factors may be controlled with adequate pharmacologic treatment and lifestyle changes. It is estimated that IHD costs the nation $129.9 billion per year.

Because heart disease is the leading cause of all deaths, as well as a leading cause of premature death, it has significant economic and social ramifications. In 2003 the national estimate of the direct and indirect cost of all heart disease will be $229.9 billion. The direct costs include care given by physicians and other health professionals, hospital and nursing home services, medication costs, home health services and other medical durables. Indirect costs include lost productivity resulting from **morbidity** and **mortality**. Costs of all heart disease in Michigan, extrapolated from the above data for 2003 is $8.07 billion.

How is Michigan doing?

In 2001, 31% of all Michigan deaths were from heart disease (26,766 deaths) and it was the second highest cause of **Years of Potential Life Lost (YPLL)** in Michigan, measured per 100,000 population at 1,260.5. In 2000 there were 158,033 hospital admissions due to heart disease.

Figure 6: Leading Causes of Death, Michigan Residents, 2001

Heart Disease 31%
26.766 Deaths

Cancer 23%
19.608 Deaths

Stroke 7%
5,666 Deaths

All other causes

Next 7 of top 10 causes
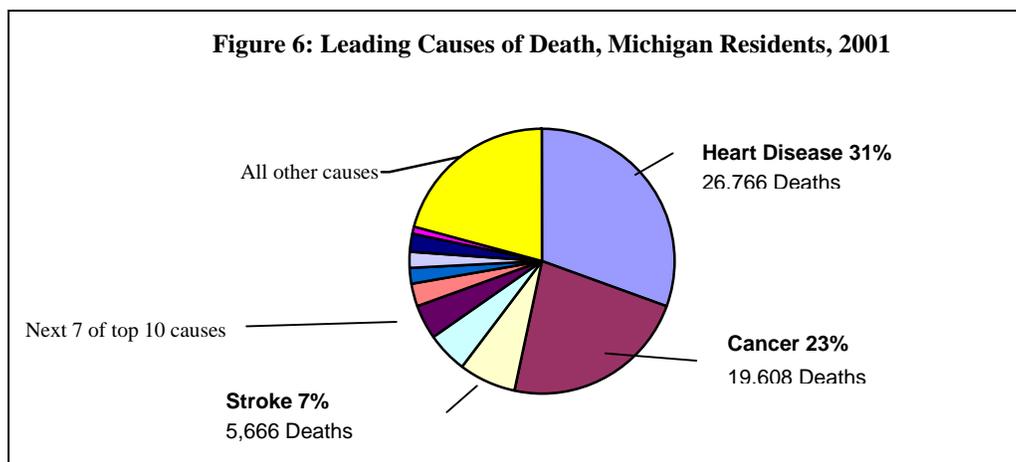
Bureau of Epidemiology, MDCH, December 2002.

How does Michigan compare with the U.S.?

Heart disease mortality rates are significantly higher in Michigan. Michigan ranks 40th from the lowest rates of total cardiovascular disease mortality among the states, and 46th on coronary heart disease mortality rates. Michigan rates have been consistently worse than U.S. average rates.

Figure 7: Heart Disease Mortality Rates by Race
Michigan vs United States 1990-2000
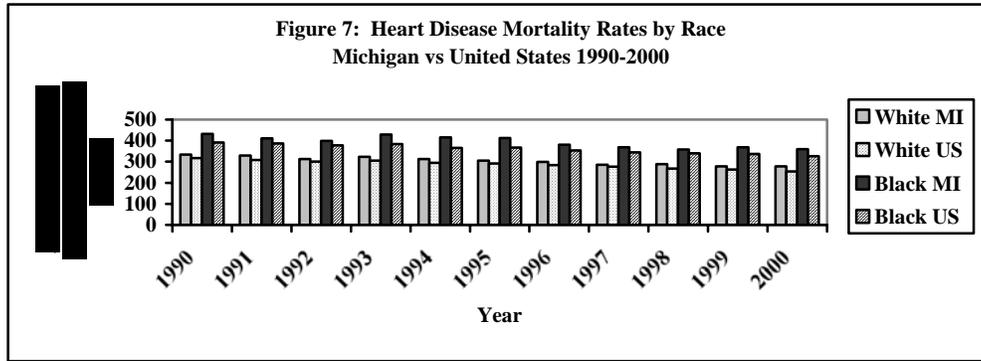
Healthy People 2010 goal:

12-1.   **Reduce coronary heart disease deaths.**

Target: 166 deaths per 100,000 population.

U.S. Baseline: 208 coronary heart disease deaths per 100,000 in 1998 (age-adjusted to year 2000 standard population).

Target setting method: 20 percent improvement.

U.S. Data Source: National Vital Statistics System (NVSS), CDC, NCHS.

How are different populations affected?

Heart disease rates tend to be higher among males, blacks, and Michigan residents over age 65. Some Michigan residents live in regions of the state showing geographic clustering of higher than average heart disease rates.

Figure 8: Heart Disease Mortality by Gender by Race, Michigan 1992-2001

Figure 9:

Michigan Heart Disease Death Rates, Above Average Counties 1997-2001

NOTES:
Michigan counties, shaded, with heart disease annual age-adjusted death rate averages, 1997-2001, above the Michigan state average of 289.4 deaths per 100,000 population. Data from Michigan vital statistics.

7-30-03

What other information is important to know?

Reducing heart disease deaths is important for a number of reasons. The economic and personal loss is significant. With an aging population, the potential burden of the disease will likely increase. Our children and youth are showing increasing rates of risk factors associated with heart disease and this will contribute to increasing rates of the disease. Nationally, medical procedures for cardiac **catheterizations** have increased 341% from 1979 to 2000. The average cost of a cardiac catheterization increased from $11,232 in 1993 to $16,838 in 2000 while the length of stay decreased from 4.7 days to 3.6 days. These trends point to an increasing burden of disease despite progress in technology and science.

Additional Resources:
- American Heart Association. (2003). Heart Disease and Stroke Statistics.
- Vital Records & Health Data Development Section, Michigan Department of Community Health. www.michigan.gov/mdch.
- Michigan Department of Community Health (December 2002). Epidemiology of Diseases of the Heart Fact Sheet. Bureau of Epidemiology.

<center>*<u>Stroke</u>*</center>

Overview of Stroke

Stroke is the third leading cause of death in Michigan and the nation. A stroke occurs when the blood supply in a vessel in the brain either is blocked or bursts, thereby causing reduction and/or loss of blood supply to an area of the brain. This loss of blood supply and nutrients causes death, paralysis or other severe problems. Every stroke is different depending on the cause and the area of the brain affected. Blockage of the blood supply is referred to as an ischemic stroke and is caused by a progressive narrowing of a vessel from **atherosclerotic** changes (**thrombolitic**) or a blood clot that has traveled to the area and lodged itself in that vessel (**embolitic**). Ischemic strokes make up 88% of all strokes that occur. The other type of stroke is a **hemorrhagic stroke**, which makes up 12% of all strokes, includes **intracerebral** hemorrhage (9%) and **subarachnoid** hemorrhage (3%). Another type of stroke, which is usually temporary in nature, is a transient ischemic attack (TIA). A TIA by definition lasts less than 24 hours and often all symptoms go away after 24 hours.

The devastating effects of a stroke include paralysis, trouble speaking and/or thinking, vision problems and other difficulties. These effects usually persist because when brain cells are injured or die, they are not replaced. Therefore, stroke is the leading cause of serious, long-term disability. Between 15-30% of stroke survivors are permanently disabled and others have some residual deficit. Another challenge is that 14% of those who survive a first stroke or TIA, will have another one within one year.

In 1996 a clot-busting drug was approved to treat acute ischemic stroke. This provided a new opportunity for reducing the effects of this type of stroke and limiting long-term disability. For this drug to be given, the type of stroke needs to be established because the drug is only given for ischemic strokes and it must be given within three hours of onset of the stroke. There are challenges in accomplishing this, especially in educating the public about signs and symptoms of a stroke, and the need to seek immediate care. Emergency medical systems and emergency departments must organize their response and care considering the three-hour window of time.

In 2003 the national estimate of the direct and indirect cost of stroke will be $51.2 billion. The direct costs include care given by physicians and other health professionals, hospital and nursing home services, medication costs, home health services and other medical durables. Indirect costs include lost productivity resulting from **morbidity** and **mortality**. Costs of stroke in Michigan, extrapolated from the above data for 2003, are $1.8 billion. An analysis of Michigan Medicare discharge data of stroke events from October 1, 1997 to September 30, 1998 found 43,467 hospital days, and $10,041 per patient total hospital costs; 18% of these patients were admitted to a skilled nursing home, incurring significant ongoing costs. Government, through Medicaid, Medicare and other payment systems, bears much of the funding for stroke care.

How is Michigan doing?

In 2001, seven percent of all Michigan deaths were from stroke (5,666). In 2000 there were 37,405 Michigan hospital admissions due to stroke. In 2001, stroke was the sixth highest cause of **Years of Potential Life Lost (YPLL)** in Michigan, measured per 100,000 population at 186.7.

How does Michigan compare with the U.S.?

Michigan ranks 30th from the lowest rates of stroke in the U.S. This is higher than the U.S. rate.

Figure 10: Stroke Mortality Rates by Race Michigan vs. United States 1990 - 2000
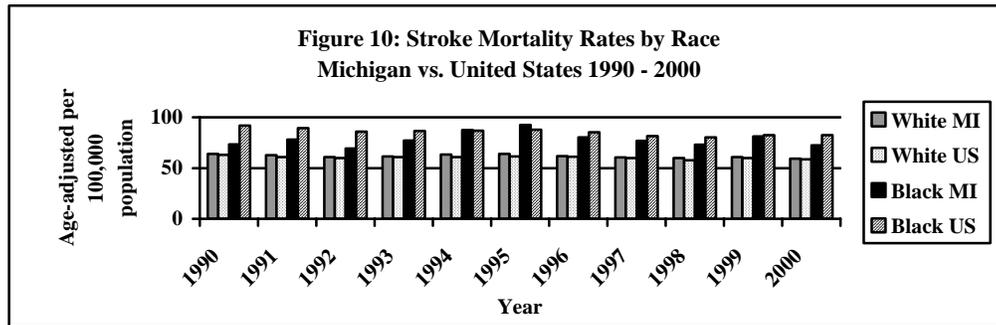
Healthy People 2010 goal:

**12-7.   Reduce stroke deaths.**

Target: 48 deaths per 100,000 population.

U.S. Baseline: 60 stroke deaths per 100,000 in 1998 (age-adjusted to year 2000 standard population).

Target setting method: 20 percent improvement.

U.S. Data Source: National Vital Statistics System (NVSS), CDC, NCHS.

How are different populations affected?

While stroke can be found in all groups, some demographic groups have higher rates than others. Stroke rates tend to be higher among males, blacks, Michigan residents over age 65, and those living in specific geographic regions in Michigan.

Figure 11: Stroke Mortality by Gender by Race, Michigan 1992-2001
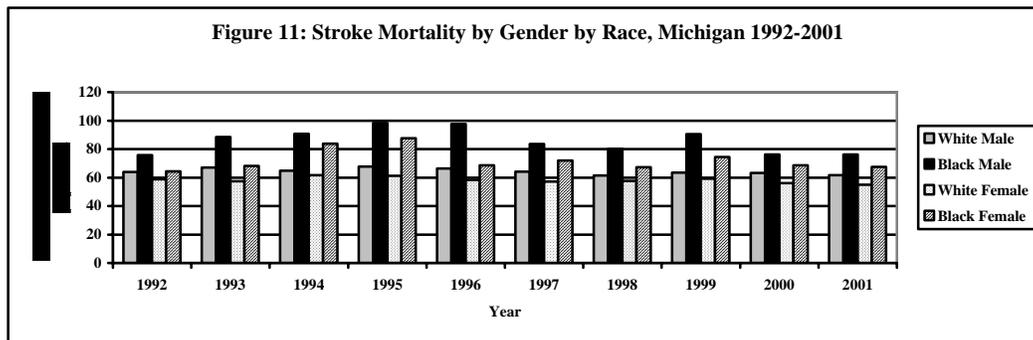
Figure 12:
Michigan Stroke Death Rates, Above Average Counties 1997-2001

NOTES:
Michigan counties, shaded, with stroke annual age-adjusted death rate averages, 1997-2001, above the Michigan state average of 61.5 deaths per 100,000 population. Data from Michigan vital statistics.
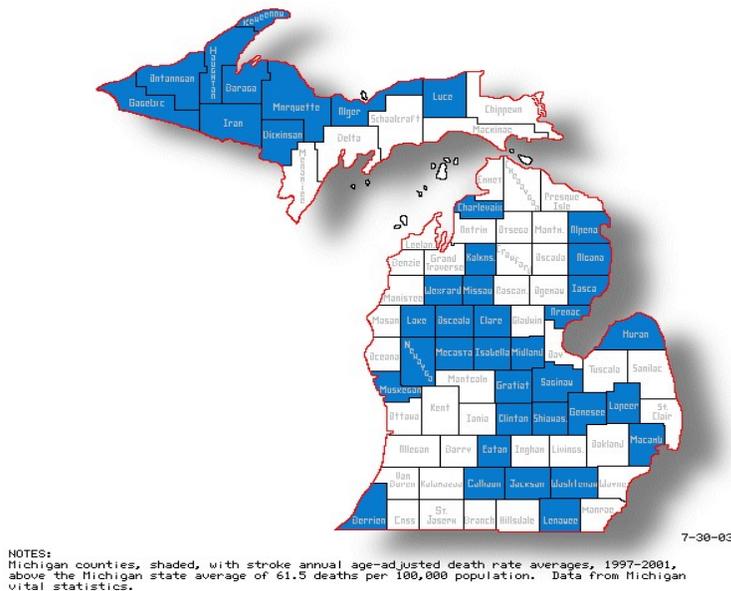
What other information is important to know?

As many as two-thirds of strokes can be prevented through the identification and control of primary risk factors such as high blood pressure, diabetes, smoking, high blood cholesterol and heart disease. It is estimated that 80% of the strokes occur in 20% of the population, so known modifiable risk factors play a significant role. For example, high blood pressure increases the risk of stroke four to six times in affected persons, diabetes has three times the risk, cigarette smoking has two to four times the risk, and the greater the number of risk factors or severity, the greater the likelihood of a stroke.

Many risk factors for stroke overlap with those for heart disease. Heart disease and stroke are the major disease categories of a larger classification called cardiovascular disease, and these risk factors are often referred to as cardiovascular disease risk factors.

Additional Resources:
- American Heart Association, Heart and Stroke Statistics. Taking Charge Against Stroke.
- American Heart Association. (2003 Update). Heart Disease and Stroke Statistics.
- Michigan Department of Community Health (2000). Michigan Stroke Initiative. Report and Recommendations.
- Vital Records & Health Data Development Section, Michigan Department of Community Health. www.michigan.gov/mdch.
- Michigan Department of Community Health. (December 2002). Epidemiology of Diseases of the Heart Fact Sheet. Bureau of Epidemiology.

Diabetes

Overview of Diabetes

Diabetes is a chronic disease characterized by high blood glucose levels due to reduced levels of insulin produced by the pancreas and/or the body's inability to use insulin effectively to lower blood glucose. It is associated with increased risk of heart attack, blindness, birth defects, amputation, and kidney failure. Diabetes deaths, as an underlying cause, are the sixth leading cause of all deaths in Michigan and the tenth leading cause of **years of potential life lost (YPLL)** for people below the age of 75.

How is Michigan doing?

There are two ways to measure diabetes *deaths*: 1) diabetes deaths that are based on the number of deaths with diabetes listed as an underlying cause, and 2) diabetes-related deaths that are based on the number of deaths with diabetes listed as an underlying cause *plus* deaths which list diabetes as a contributing cause or other significant condition. In 2001, there were 2,640 deaths due to diabetes as an underlying cause and an additional 5,269 deaths in which diabetes was a contributing factor for a total of 7,909 diabetes-related deaths to Michigan residents. The age-adjusted rate for diabetes-related deaths was 82.3/100,000 population. Diabetes-related death rates have been increasing during the past ten years.

The rate of persons that have been **clinically diagnosed** with diabetes has continued to increase over the past decade. There has been a 24% increase over the past six years. As the numbers of persons with diabetes has increased, there has not been an increase in the proportion getting the recommended annual dilated eye examinations and foot examinations. Early detection of complications from diabetes, such as blindness and lower extremity amputations, can be delayed or even avoided with proper early detection methods.

How does Michigan compare with the U.S.?

Michigan's 2001 age-adjusted rate for diabetes as an underlying cause of death of 27.4 was higher than the U.S. rate of 25.2. Michigan and U.S. comparison are listed for diabetes as an underlying cause of death. Diabetes was the sixth leading cause of all deaths in the U.S. and the ninth leading cause of YPLL in 2001.

The U.S. and Michigan age-adjusted rate of deaths due to diabetes as an underlying and related cause increased from 1996 to 2001. (See Table 4)

Table 4: Age-Adjusted Deaths of Persons with Diabetes					
	1997	**1998**	**1999**	**2000**	**2001**
Underlying/100,000 Population Michigan	26.0	25.8	26.7	27.2	27.4
Underlying/100,000 Population US	24.0	24.4	25.1	25.2	25.2
Related/100,000 Population Michigan	80.2	79.8	81.6	82.3	82.9

Over the past decade, **prevalence** of diabetes as a rate per 1,000 population has increased in Michigan and in the U.S. This trend is moving in the wrong direction and is largely related to the increase in **obesity** and the aging of our population. In Michigan, the increase in diabetes prevalence has been higher compared to the increase in other states. Identifying more persons with diabetes increases the chances of reducing the complications from the disease.

Table 5: Prevalence of diagnosed diabetes					
Estimate of diagnosed diabetes	**1997**	**1998**	**1999**	**2000**	**2001**
Michigan BRFSS* (age-adjusted per 1,000 population)	58	69	54	70	72
Michigan BRFSS (**crude rate** per 1,000 population)	58	70	54	70	72
United States[1] (age-adjusted per 1,000 population – NHIS**)	40	41	41	45	N/A
United States BRFSS (crude per 1,000 population)	48	54	56	61	70

* Behavioral Risk Factor Surveillance Survey
**National Health Information Survey (N/A = Not Available)

Diabetes is the leading cause of adult blindness. Over half of the cases of blindness can be avoided with annual dilated eye exams, proper care of the eyes, and blood glucose control. Regular eye exams detect early onset of eye problems. If eye problems are not diagnosed until the person notices the problem, much of the damage may have already been done and is irreversible. Increasing the percentage of persons with diabetes who receive an annual eye exam is critical.

Table 6: Percent Dilated Eye Examination					
Percent Dilated Eye Examination	**1997**	**1998**	**1999**	**2000**	**2001**
Michigan BRFSS	69%	67%	73%	79%	65%
United States (NHIS – HP2010)	62%	49%	61%	N/A	65%

Amputations associated with diabetes are the result of reduced blood flow in the legs and feet, accompanied with the loss of feeling in the foot. Frequent foot exams allow for early detection of foot problems and proper action resulting in a decreased chance for amputation. Once a person has an amputation, the probability of having another one increases. The U.S. and Michigan show increases in foot exams but neither has reached the *Healthy People 2010* goal of 75%.

Table 7: Persons with diabetes who have at least an annual foot examination					
Annual Foot Examination	**1997**	**1998**	**1999**	**2000**	**2001**
Michigan BRFSS	53%	51%	52%	60%	63%
United States (NHIS – HP2010)	55%	68%	67%	62%	66%

Healthy People 2010 goals:

5-3. **Reduce the overall rate of diabetes that is clinically diagnosed.**

Target: 25 overall cases per 1,000.

U.S. Baseline: 40 cases of diabetes per 1,000 population in 1997 (age-adjusted to the 2000 standard population).

Target setting method: Better than the best (retain the 2000 target).

U.S. Data Source: National Health Interview Survey (NHIS), CDC, NCHS.

5-5.   Reduce the diabetes death rate.

Target: 45 deaths per 100,000 population.

U.S. Baseline: 75 deaths per 100,000 population related to diabetes in 1997 (age-adjusted to 2000 standard population).

Target setting method: 43 percent improvement.

U.S. Data Source: National Vital Statistic System (NVSS), CDC, NCHS.

5-13.   Increase the proportion of persons with diabetes who have an annual dilated eye examination.

Target: 75 percent of the persons with diabetes.

U.S. Baseline: 47 percent of adults aged 18 and older with diabetes had an annual dilated eye examination in 1998 (age-adjusted to the 2000 standard population).

Target setting method: Better than the best.

U.S. Data Source: National Health Interview Survey (NHIS), CDC, NCHS.

5-14.   Increase the proportion of person with diabetes who have at least an annual foot examination.

Target: 75 percent of the persons with diabetes.

U.S. Baseline: 68% of adults aged 18 and older with diabetes had at least an annual foot examination in 1998 (age-adjusted to 2000 standard population). Revised after publication.

Target setting method: Better than the best.

U.S. Data Source: Behavioral Risk Factor Surveillance Survey (BRFSS), CDC, NCCDPHP.

How are different populations affected?

The 2002 Michigan BRFSS data suggest that minority populations have higher diabetes rates than the overall population. The diabetes **prevalence** is 8.1/100; for blacks, Hispanics, and Native Americans it is 11.3/100, 6.2/100, and 9.4/100 respectively. Prevalence increases with age; 8.5% of persons between 45 and 54 years of age have diabetes while 20.1% of those aged 65-74 have diabetes. Diabetes is the leading cause of morbidities such as blindness, kidney disease, and amputations. Diabetes-related medical costs in Michigan exceed $2.9 billion annually with 60% attributed to hospitalization. It is estimated that diabetes costs in 2000 for medical care and lost productivity exceeded $6.4 billion – a 56% increase since 1994.

What other information is important to know?

The Michigan Diabetes Prevention and Control Program (MDPCP) works to decrease the prevalence and impact of diabetes on the citizens of Michigan. The MDPCP funds programs and projects to improve the availability and delivery of diabetes services and develop prevention and control initiatives to assist in delaying and/or preventing the development of diabetes and its complications. Some of the major projects include the Michigan Diabetes Outreach Network (DON) comprised of six regional DONs; state certification program for Diabetes Self-Management Training; the Michigan Association of Health Plans *Taking on Diabetes in Michigan*; and participation in the DHHS Diabetes Detection Initiative.

Additional Resources:

- National Institute of Health et. al. Renal Data System. (2002). *USRDS 2002 Annual Data Report: Atlas of End-Stage Renal Disease in the United States.* Bethesda, MD.
- Anderson RN. (September 2002). "Deaths: Leading Causes for 2000." *National Vital Statistics Report.* Hyattsville, MD: National Center for Health Statistics.
- U.S. Department of Health and Human Services. *Healthy People 2010.* 2nd ed. With Understanding and Improving Health and Objectives for Improving Health. 2 vols. Washington, DC: U.S. Government Printing Office, November 2000.
- Vital Records & Health Data Development Section, Michigan Department of Community Health. www.michigan.gov/mdch.
- National Kidney Foundation. (February 2002). Kidney Disease Outcomes Quality Initiative. "K/DOQI Clinical Practice Guidelines for Chronic Kidney Disease: Evaluation, Classification, and Stratification." American Journal of Kidney Disease. 39 (2) (Supplement 1), S1-S266.
- National Heart, Lung and Blood Institute.
- Renal Network of the Upper Midwest, (2001). Annual Data Report.
- United Network for Organ Sharing.
- Transplantation Society of Michigan.

End-stage Renal Disease

Overview of End-stage Renal Disease

Chronic kidney disease (CKD) is a progressive, permanent condition in which the kidneys are damaged and gradually lose their effectiveness. CKD typically causes no noticeable symptoms until it is well advanced. Early warning signs exist, and simple tests can be done to diagnose the disease in its initial stages. If CKD is caught early enough, healthcare providers can treat it and delay or even prevent its progression to the associated severe health issues, including kidney failure (also called end-stage renal disease or ESRD) and cardiovascular disease. Untreated, CKD will progress to kidney failure. Once kidney failure occurs, treatment, either dialysis or kidney transplant, is necessary to maintain life. Without treatment, individuals with kidney failure will experience multiple and severe health complications, followed by death.

Diabetes and high blood pressure are the two leading causes of kidney failure in the U.S. Diabetes, the leading cause, accounts for more than 44% of the new cases each year. High blood pressure accounts for approximately 27% of the new cases each year. Diabetes and high blood pressure often co-exist, increasing an individual's risk. **Glomerulonephritis**, the third leading cause, is responsible for nearly 10% of new cases each year. **Cystic kidney disease**, the fourth leading cause, accounts for 3% of new cases each year.

CKD is a serious public health problem that is rapidly approaching **epidemic** proportions. CKD is the 9th leading cause of death in the U.S. and in Michigan and is recognized as a major health problem by the National Institutes of Health, which has made the reduction of new cases of CKD, along with its complications, disability, death, and economic costs, a primary focus of the *Healthy People 2010* objectives.

How is Michigan doing?

Michigan's ESRD incidence rate of 350 per million persons exceeds the nation's rate of 337 per million. It is estimated that 11% of the adults living in Michigan age 20 and older in 2002 had CKD, and many do not know it. Even more Michigan residents (769,000) were at increased risk of developing the disease.

More than eight million American adults aged 20 and older (307,600 in Michigan) are living with major reductions in kidney function. In Michigan, 769,000 adults, age 20 and older have CKD. Another 1.3 million Michigan residents have diabetes and/or hypertension, putting them at increased risk of developing CKD and its related complications. Researchers estimate that, by 2010, 661,000 Americans (24,000 in Michigan) will be living with kidney failure and will require dialysis or kidney transplantation to stay alive. In 2000, 269,408 Americans (9,460 in Michigan) were on dialysis. The same year, 14,311 Americans (486 in Michigan) received kidney transplants, and another 45,000 (1,500 in Michigan) were awaiting transplants. It is unknown how many people die from CKD since they often die of other related diseases.

Figure 13:
Incidence of End-Stage Renal Disease
in Michigan by Diagnosis 1990 - 2001
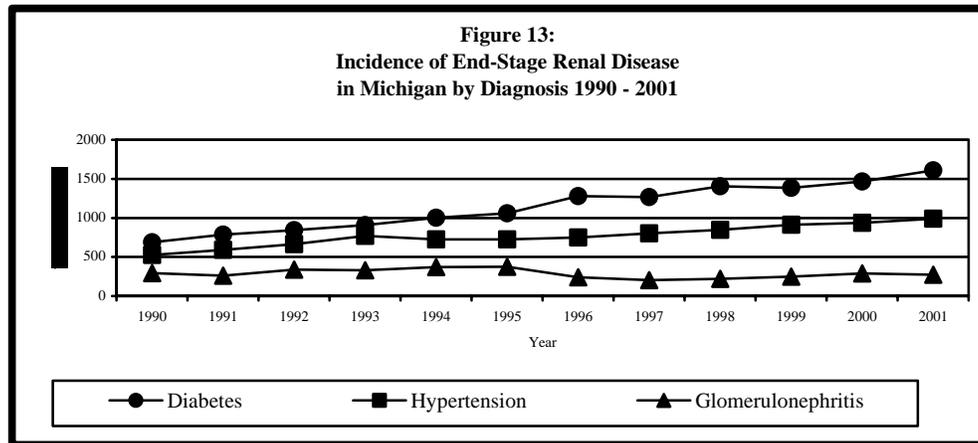
How does Michigan compare with the U.S.?

The National Kidney Foundation estimates that more than 20 million Americans (one in nine adults aged 20 and older) have CKD and that another 20 million are at increased risk for developing the disease but may not know it. Each year, more than 90,000 Americans are diagnosed with kidney failure; in 2000, more than 350,000 Americans were living with the complications of kidney failure that required dialysis and/or kidney transplantation. Research indicates that there is a steady, alarming growth in incidence of CKD, especially kidney failure, which has been doubling every ten years in the U.S.

Healthy People 2010 goal:

4-1.   Reduce the rate of new cases of end-stage renal disease (ESRD).

Target: 217 cases per million population.

U.S. Baseline: 289 new cases of ESRD per 1 million population were reported in 1997.

Target setting method: Better than the best.

U.S. Data Source: U.S. Renal Data System (USRDS), NIH, NIDDKD.

How are different populations affected?

Men are more likely to develop kidney failure than women. While whites represent the largest percentage of kidney failure cases (61%), there are significant racial and ethnic disparities within kidney failure **morbidity** and **mortality** rates. Blacks have a much higher risk of CKD. Blacks are 4.7 times more likely than whites to be treated for kidney failure, and they develop kidney failure at an earlier age. Although they comprise around 14% of the population in Michigan, blacks account for more than 47% of the dialysis population. In 1999, the average age for dialysis was 59 years for blacks and 66 years for whites living in the U.S. In Michigan in 2001, 63% of new cases were to whites and 35% were to blacks.

Native Americans, Hispanics and Asians are at increased risk for both CKD and kidney failure. In 2000, blacks had a kidney failure rate of 777 cases per million population, Native Americans had a rate of 501 cases per million population, Asians had a rate of 281 cases per million population, and Hispanics had a rate of 276 cases per million population. The kidney failure rate for whites that year was less than any of these groups (269 cases per million population).

The number of minority persons living with kidney failure is rising in the U.S., averaging a 10% increase per year. New cases of kidney failure are increasing by 6% a year for whites, 7% a year for blacks, 10% a year for Native Americans, and 11% a year for Asians.

What other information is important to know?

Kidney diseases are a major cause of days of work lost, doctor visits, and hospitalizations in the U.S. The direct and indirect costs of kidney failure are affected by the fact that 65% of the cases will occur in working-aged adults between the ages of 20 and 64; another 21% of the cases will occur before the age of 75. In 2000, average healthcare costs for Michigan residents with kidney failure were $50,000 per person per year, 20 times higher than the average of $2,500 per person per year in healthcare costs for Michigan residents without kidney failure. In 2000, Medicare medical expenses alone were more than $12 billion for kidney failure care. Inpatient and outpatient treatment cost $9.4 billion, and an additional $2.3 billion was spent for physician care and/or supplier services. In 2000, nearly $18 billion was spent to treat U.S. residents with kidney failure; $600 million of that was spent to treat Michigan patients with kidney failure.

Although these costs are staggering, they do not take into account residents' out-of-pocket payments for health insurance deductibles and co-payments, medications, transportation, or other non-covered healthcare charges. They also do not include the value of lost wages and opportunity costs for kidney failure patients and their family members and/or other caregivers.

Additional Resources:
- National Kidney Foundation. (February 2002). Kidney Disease Outcomes Quality Initiative. "K/DOQI Clinical Practice Guidelines for Chronic Kidney Disease: Evaluation, Classification, and Stratification." American Journal of Kidney Disease. 39 (2) (Supplement 1), S1-S266.
- Vital Records & Health Data Development Section, Michigan Department of Community Health. www.michigan.gov/mdch.
- U.S. Renal Data System.
- National Institutes of Health.
- National Institutes of Diabetes & Digestive & Kidney Diseases.
- National Institutes of Health. (2001). National Kidney Disease Education Program Strategic Development & Planning Meeting Baseline Report. Bethesda, MD, June 28-29.

## Asthma Mortality and Hospitalizations

Overview of Asthma

Asthma is a chronic inflammatory disease of the lungs, characterized by shortness of breath, wheeze, cough, and/or chest tightness. Approximately 860,000 people in Michigan, including over 215,000 children, have asthma. Although there is no cure, asthma can be controlled using medications to control inflammation and airway constriction, regularly assessing lung function, and avoiding exposure to things that make asthma worse, such as tobacco smoke. Uncontrolled asthma can lead to serious consequences, including hospitalization or death.

How is Michigan doing?

In 2001, asthma caused 5,363 hospitalizations in Michigan, including 6,089 hospitalizations in children less than 18 years of age. Asthma was the fourth leading cause of all preventable hospitalizations and the leading cause of preventable hospitalizations in children, causing more than a quarter of all preventable pediatric hospitalizations. Each year, asthma costs Michigan about $110 million in hospital charges.

Asthma hospitalization rates are improving for some age groups. Significant overall decreases in hospitalization rates occurred in children ages 0-4 and <18 years and in older adults (age 65+) between 1990 and 2001 (see figures below).

Figure 14: Asthma Hospitalization Rates Michigan Residents

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
✱ 0-4 years	66.1	56.8	63.7	59.1	52.4	63.1	59	58.7	40.4	40.5	48.4
▢ 5-64 years	14	13.8	13.7	15.6	14.6	15.6	15.1	14.4	13.3	13.3	13.6
△ 65+ years	25.7	24.3	24	25.5	23.8	20.8	18.4	16.7	16.6	17.1	15.2

Figure 15: Asthma Hospitalization Rates Michigan Children 0-18 years

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
● 0-18 Years	32.6	29.2	30.9	31.4	26.8	32.5	30.5	30.5	22.1	22	26.6

Source: Division of Epidemiology Services, Bureau of Epidemiology, MDCH

Between 1990 and 2001, there were 1,986 deaths in Michigan with a primary cause of asthma with a rate of 17.0/million people in Michigan. Annual asthma **mortality** rates fluctuated between 15.8 and 20.7/million people, with no appearance of a consistent increase or decrease in the rate during this time period.

Figure 16: Asthma Mortality Rate Per Million Michigan Residents, 1990-2001

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All Ages	16.5	18.3	16.9	19.8	18.9	20.7	18.2	16.2	20.2	16.6	16.8	15.8
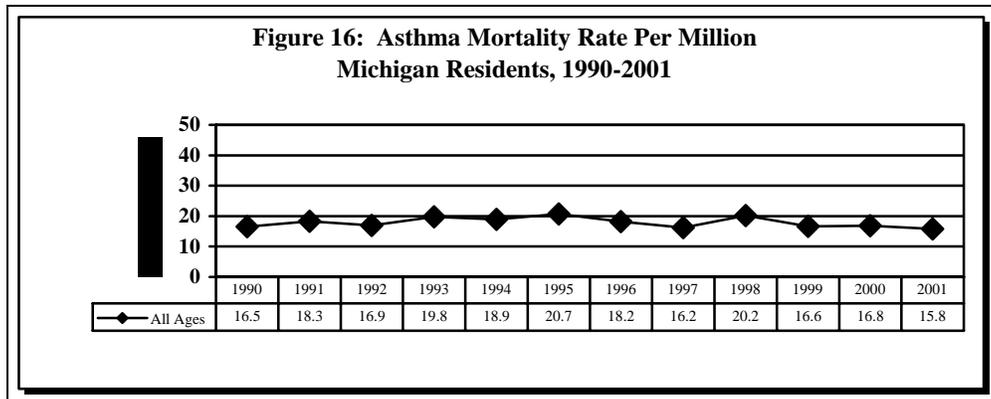
Source: Epidemiology Services Division, Bureau of Epidemiology, MDCH

How does Michigan compare with the U.S.?

Asthma hospitalization rates for children under five and adults over 65 were lower in Michigan than for the U.S. in 2001. Michigan's hospitalization rate in children <18 years was higher than the U.S. However, Michigan's rate for 5-64 year olds was about the same as the U.S.

Table 8: Asthma Hospitalizations per 10,000 Population, 2001		
Age Group	United States	Michigan
<5 years	56.2	49.7
5-64 years	11.8	12.6
65+ years	21.4	16.5
<18 years	21.4	24.2

Michigan's asthma mortality rates were similar to those of the U.S. in 2001.

Table 9: Asthma Deaths per million population, 2001		
Age Group	United States	Michigan
<5 Years	2.1	< 5 deaths*
5-14 Years	2.4	3.5
15-34 Years	4.7	6.1
35-64 Years	14.7	16.8
65+ Years	60.7	54.8

*Rates are not calculated if there are fewer than 5 deaths.

Asthma mortality rates in Michigan were significantly higher than the *U.S. Healthy People 2010* target rate for children, age 5 to 14 years, and adults, age 15-34 and age 35-64 (see below). However, Michigan met the target rate for asthma mortality for adults, ages 65 and older between 1999 and 2001.

Healthy People 2010 goals:

1-9. Reduce hospitalization rates for three ambulatory-care-sensitive conditions (*including pediatric asthma*).

Target 1-9a: Reduction in Hospitalizations for Ambulatory-Care-Sensitive Conditions to 17.3 admissions per 10,000 population for individuals under the age of 18 with pediatric asthma.

U.S. Baseline: 23.0 admissions per 10,000 population per 1996 data (age-adjusted to year 2000 standard population).

Target setting method: 25 percent improvement.

U.S. Data Source: Healthcare Cost and Utilization Project (HCUP), AHRQ.

24-1.   Reduce asthma deaths.

Target and U.S. Baseline:

Objective	Age Group	1998 Baseline	2010 Target
		Rate per Million	
24-1a.	Children under age 5 years	2.1	1.0
24-1b.	Children aged 5 to 14 years	3.3	1.0
24-1c.	Adolescents and adults aged 15 to 34 years	5.0	2.0
24-1d.	Adults aged 35 to 64 years	17.8	9.0
24-1e.	Adults aged 65 years and older	86.3	60.0

Target setting method: Better than the best.

U.S. Data Source: National Vital Statistics System (NVSS), CDC, NCHS.

24-2.   Reduce hospitalizations for asthma.

Target and U.S. Baseline:

Objective	Age Group	1998 Baseline	2010 Target
		Rate per 10,000	
24-2a.	Children under age 5 years	45.6	25
24-2b.	Children and adults aged 5 to 64 years	12.5	7.7
24-2c.	Adults aged 65 years and older	17.7	11

Target setting method: Better than the best.

U.S. Data Source: National Hospital Discharge Survey (NHDS), CDC, NCHS.

How are different populations affected?

Asthma hospitalization rates are highest in young children, black residents, and in urban areas. Among children <18 years, asthma hospitalization rates are highest in preschool aged children, decreasing with age into adolescence. Rates increase again in adulthood.

Whether asthma is higher in males or females depends upon age. For example, in 2001 the asthma hospitalization rate for boys, age 1 to 14 years, (30.9/10,000) was 61% higher than the rate for girls (19.1/10,000). After age 15, the gender difference in asthma hospitalization rates shifts, and rates are higher among females than males.

Asthma hospitalization rates in Michigan are three to five times higher in blacks as in whites. In 2001, the asthma hospitalization rate for black persons, age 5 to 64 years, (39.2/10,000) was about 5 times higher than the rate for white persons (8.0/10,000). Asthma hospitalization rates for whites decreased significantly between 1990 and 2001 in all age categories, while rates for blacks did not significantly change for any group.

Asthma hospitalization rates are higher in urban areas. Wayne and Saginaw County have higher asthma hospitalization rates than the rest of the state for all age groups. Nine other counties have higher asthma hospitalization rates in at least one age group.

Mortality rates are higher for black residents and in urban areas. Asthma mortality rates increase with age. For example, in 2001 asthma mortality rates increased from 3.5 asthma deaths per million children ages 5-14 years to 54.8 asthma deaths per million adults age 65 or older. Fewer than five asthma deaths occurred in children less than five years old in 2001.

Racial disparities are also evident in asthma mortality rates. The disparity is largest among individuals under age 65, with rates for blacks being between 4.7 to 7.5 times higher in blacks than in whites. Wayne County has the largest number of asthma deaths annually.

What other information is important to know?

Most of the problems caused by asthma could be prevented if persons with asthma and their healthcare providers manage the disease according to established guidelines. These guidelines call for:

1) initial and periodic assessment of asthma including objective measures of lung function,
2) avoiding or reducing exposure to common triggers;
3) use of long-term control medications and quick-acting rescue medications, and
4) education for a partnership in asthma care.

The economic burden of asthma mostly affects patients with severe or poorly controlled disease. Socioeconomic status, particularly poverty, is a contributing factor to asthma illness, disability, and death. Reasons for these differences are unclear, but likely result from multiple factors occurring in low socioeconomic brackets including:

1) high levels of exposure to tobacco smoke, pollutants, and environmental allergens (house dust mites, cockroach particles, pet dander and mold);
2) lack of access to quality medical care; and
3) lack of finances and social support to manage the disease effectively on a long-term basis.

Although the majority of asthma deaths are preventable, mortality from asthma has increased nationally since the 1970s. Studies have shown high rates of asthma mortality among blacks, low-income populations, and populations with low education levels. Being black is independently associated with increased asthma mortality. Reasons suggested for the racial disparity in mortality include differential access to care, exposure to environmental pollutants, and crowded conditions leading to increased exposure to allergens and infections. Overuse of beta-agonists, under-use of inhaled corticosteroids, smoking, drinking, and family disruption have also been associated with increased mortality in people with asthma, while the use of **peak flow meters** and written action plans have been associated with decreased mortality.

Additional Resources:

- Agency for Healthcare Research and Quality. Healthcare Cost and Utilization Project. Rockville, MD. http://www.ahrq.gov/data/hcup/hcupnet.htm.
- National Center for Health Statistics, Center for Disease Control. (2000) National Vital Statistics System, Mortality.
- Vital Records & Health Data Development Section, Michigan Department of Community Health. www.michigan.gov/mdch.
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- Weiss KB, Wagener DK. (1990) Changing Patterns of Asthma Mortality: Identifying Target Populations at High Risk. Journal of the American Medical Association, 264:1683-1687.
- Grant EN, Lyttle, CS, Weiss KB. (2000) "The Relation of Socioeconomic Factors and Racial/Ethnic Differences in U.S. Asthma Mortality." American Journal of Public Health, 90:1923-1925.
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- Spitzer WO, Suissa P, Ernst R, et al. (1992). "The Use of B-agonists and the Risk of Death and Near-Death from Asthma." New England Journal of Medicine, 326:500-506.
- Ernst P, Spitzer WO, Suissa S, et al. (1992). "Risk of Fatal and Near-Fatal Asthma in Relation to Inhaled Cortiocosteroid Use." Journal of the American Medical Association, 268: 3462-3464.
- Abramson MJ, Bailey MJ, Couper FJ, et al. (2001) "Are Asthma Medication and Management Related to Deaths from Asthma?" American Journal of Respiratory Critical Care Medicine. 163:12-18.

# Arthritis and Other Rheumatic Conditions

Overview of Arthritis

Arthritis encompasses more than 100 diseases and conditions affecting a body's joints, the surrounding tissues, and other connective tissues. Arthritis and other **rheumatic conditions** are among the most common chronic diseases and are the leading cause of disability among U.S. adults. In 2001, 70 million adults in the U.S. were affected by these conditions. The numbers (and related healthcare costs) will continue to rise as the baby-boomer generation ages. It is estimated that the number of affected persons ages 65 years and older will double by 2030.

No monetary figure can be attached to the human consequences of arthritis. The symptoms of arthritis—pain, aching, stiffness, and swelling in or around the joints—have a significant effect on quality of life not only for the individual who experiences symptoms but also for family members and caregivers. Arthritis can have a negative effect on a person's mental health. It is common for persons struggling to cope with the disease to experience anxiety, depression, and feelings of helplessness. It is also difficult for many people with arthritis to remain physically active; their physical inactivity leads to decreased mobility, fatigue, and sometimes, loss of their jobs. Although death from arthritis is not common, some forms of arthritis, such as rheumatoid arthritis and lupus, affect multiple organs and can result in life-threatening complications.

How is Michigan doing?

An estimated three million adults (four in ten) and 7,000 children have arthritis or a related rheumatic condition. The most common forms of arthritis and estimated number of adults with each are: osteoarthritis (470,000), gout (331,000), rheumatoid arthritis (207,000), **fibromyalgia** (133,000), **lupus** (65,000), **scleroderma** (33,000), and **Lyme disease** (26,000). An estimated additional 1,234,000 adults have been diagnosed, but are unable to identify the type of arthritis they have.

In 2001, 2.6% of hospitalizations in Michigan had arthritis as the primary diagnosis. Nearly 10,000 Michigan adults had total knee replacements and over 5,000 Michigan adults had total hip replacements due to osteoarthritis. Michigan's share of the national economic expenditures for arthritis-related care is approximately $2.2 billion each year for direct medical costs, and an additional $2.8 billion annually for indirect costs such as lost productivity and disability.

Figure 17: Estimated Number of Michigan Adults with Selected Rheumatic Diseases

Disease	Number
Osteoarthritis	470,000
Rheumatoid arthritis	207,000
Gout	331,000
Lupus	65,000
Fibromyalgia	133,000
Scleroderma	33,000
Lyme disease	26,000
Arthritis: Type Not Known	1,541,000
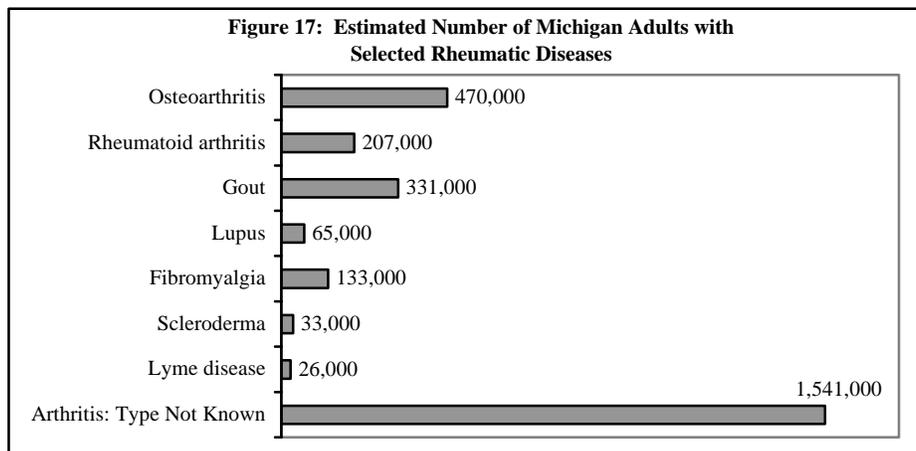
Source: Michigan Osteoporosis and Arthritis Behavioral Risk Factor Surveillance Survey 2000-2001

How does Michigan compare with the U. S.?

Michigan has one of the highest estimated **prevalence** rates of arthritis in the nation. Other states with high prevalence include Kentucky (39.4%), Ohio (36.2%), Idaho (36%), Alabama (35.7%), Tennessee (35.5%) and Indiana (35.4%).

Healthy People 2010 goals:

2-2.   **Reduce proportion of adults with chronic joint symptoms who experience a limitation in activity due to arthritis.**

Target: 21 percent.

U.S. Baseline: 27 percent of adults aged 18 years and older with chronic joint symptoms experienced a limitation in activity due to arthritis in 1997 (age adjusted to year 2000 standard population).

Target setting method: Better than the best.

U.S. Data Source: National Health Interview Survey (NHIS), CDC, NCHS.

2-3.   **Reduce the proportion of adults with chronic joint symptoms who have difficulty in performing two or more personal care activities, thereby preserving independence.**

Target: 1.4 percent.

U.S. Baseline: 2.0 percent of adults aged 18 years and older with chronic joint symptoms experienced difficulty performing two or more personal care activities in 1997 (age-adjusted to year 2000 standard population).

Target setting method: Better than the best.

U.S. Data Source: National Health Interview Survey (NHIS), CDC, NCHS.

2-5.   **Increase the employment rate among adults with arthritis in the working-aged population.**

Target: 78 percent.

U.S. Baseline: 67 percent of adults aged 18 to 64 years with arthritis were employed in the past week in 1997 (age adjusted to year 2000 standard population).

Target setting method: Better than the best.

U.S. Data Source: National Health Interview Survey (NHIS), CDC, NCHS.

How are different populations affected?

The prevalence of arthritis increases with age – from 20% among 18-24 year olds to 69% among those ages 65+. Despite the high prevalence among older citizens, arthritis is not just a disease of old age. In fact, almost two-thirds of the adults with arthritis in Michigan are under the age of 65. In Michigan, arthritis is equally likely to be seen in men and women, and in whites and blacks. Among adults under the age of 65, arthritis is more prevalent among lowest income and educational levels. For those age 65 and older, the prevalence is similar for all, regardless of income or educational level.

What other information is important to know? Although there is little that can be done to prevent arthritis (avoiding tick bites, weight control and avoiding occupational and sports

injuries), we can improve the quality of life for people with arthritis and reduce the need for medical visits. Pain and disability can be minimized by early diagnosis and management, including weight control, physical activity, self-management, physical and occupational therapy, joint replacement surgery, and newer disease-modifying medications that can slow down or stop progression of the disease.

Despite the fact that arthritis is so common, there are serious limitations in public understanding about the condition. One-third of Michigan adults reported that they knew little or nothing about arthritis. Fewer than 10% of adults could identify any of the few recognized preventive measures for arthritis. Most people were unaware that there are treatments available that can slow down or even cure the disease.

There are also gaps in understanding among Michigan's healthcare providers regarding best practices for arthritis treatment. One-third of people with arthritis stated that they wanted more information about arthritis than they received from their doctors. Forty percent of people who had been told by a physician that they had arthritis were unable to identify what type of arthritis they had. Two-thirds of those with arthritis reported that they had never had exercise mentioned as a part of their arthritis treatment. Only one in four arthritis patients who received arthritis treatments known to cause bone loss reported that their doctor had discussed side effects on bone health.

Additional Resources:
- Centers for Disease Control and Prevention, Arthritis Foundation, and Association of State and Territorial Health Officials. (1999). National Arthritis Action Plan: A Public Health Strategy.
- Centers for Disease Control and Prevention. (2003). Public Health and Aging: Projected Prevalence of Self-reported Arthritis or Chronic Joint Symptoms Among Persons Aged >=65 years. United States, 2005-2030. Morbidity and Mortality Weekly Report, 52:489-491.
- Cassidy, J. (1982). Data on Prevalence of Arthritis in Children. Pediatric Rheumatology. New York: John Wiley & Sons, (pp. 17-18).
- Michigan Department of Community Health. Michigan Inpatient Hospital Data Base (Michigan Inpatient Resident File).
- Vital Records & Health Data Development Section, Michigan Department of Community Health. www.michigan.gov/mdch.
- Dunlop, D.D., Manheim, L.M., Yelin, E.H., Song, J., and Chang, R.W. (2003). The Cost of Arthritis. Arthritis & Rheumatism, 49 (1), 101-113.
- Centers for Disease Control and Prevention: National Behavioral Risk Factor Surveillance System.

Osteoporosis and Related Hip Fractures

Overview of Osteoporosis

Osteoporosis is a condition of porous, weakened bone that can lead to life-changing fractures. In the U.S., 55% of the population over age 50 (44 million) has osteoporosis or osteopenia (low bone mass). As the U.S. population ages, this figure may climb to 61.4 million by 2020. Depression and anxiety are common following a fracture. Quality of life is affected due to fears about additional fractures, limited mobility, and coping with deformity.

In Michigan, the financial costs of osteoporosis are about $410 million. These include $228.5 for inpatient care, $139.5 million for long-term care, and $41.8 million for outpatient care. Total medical costs are expected to increase from $410 million in 2000 to $561 million in the year 2025. Medical costs for one hip fracture alone exceed $36,000. With 9,427 Michigan adults experiencing a hip fracture in 2001, hip fracture medical costs were $339 million. These costs are expected to rise 30% by the year 2025, exceeding $442 million. Osteoporosis-related fractures are not exclusive to the older population. In 2000, 7,700 people under age 65 had an osteoporosis-related fracture, costing $44 million. Additional costs from absenteeism and lost productivity are significant for this population.

How is Michigan doing?

In Michigan, 1.5 million adults over the age of 50 have osteoporosis or osteopenia. As Michigan's population ages, this number may increase to 1.9 million by the year 2020. Half of women and one in eight men age 50 and older will experience an osteoporotic fracture. In 2000, Michigan citizens had 38,614 osteoporosis-related fractures.

How does Michigan compare with the U.S.?

In Michigan, about 15% of the population has osteoporosis or osteopenia, which is consistent with the national rate. While Michigan's current **prevalence** is comparable to the national prevalence, the rate at which persons are discharged to long-term care facilities following hospitalization for an osteoporosis-related fracture is of great concern. In Michigan, 43% of patients were discharged to a long-term care facility, in comparison to only 25% nationally. This figure increases to 50% for hip fractures.

Table 10: Number of Hip Fractures in Michigan 1997 - 2001					
Michigan	**1997**	**1998**	**1999**	**2000**	**2001**
Number of Hip Fractures	9,828	9,816	9,870	9,737	9,427

Healthy People 2010 goals:

2-9   Reduce the proportion of adults with osteoporosis.

Target: 8 percent.

U.S. Baseline: 10 percent of adults aged 50 years and older had osteoporosis as measured by low total femur bone mineral density (BMD) in 1988–94 (age adjusted to the year 2000 standard population).

Target setting method: 20 percent improvement.

U.S. Data Source: National Health and Nutrition Examination Survey (NHANES), CDC, NC.

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2-10. **Reduce the proportion of adults who are hospitalized for vertebral fractures associated with osteoporosis.**

Target: 14.0 hospitalizations per 10,000 adults aged 65 years and older.

U.S. Baseline: 17.5 hospitalizations per 10,000 adults aged 65 years and older were for vertebral fractures associated with osteoporosis in 1998 (age-adjusted to year 2000 standard population).

Target setting method: 20 percent improvement.

U.S. Data Source: National Hospital Discharge Survey (NHDS), CDC, NCHS.

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15-28. **Reduce hip fractures among older adults.**

Target and U.S. Baseline:

Objective	Reduction in hip fractures	1998 Baseline	2010 Target
		Rate per 100,000	
15-28a.	Females age 65 and older	1055.8	416
15-28b.	Males age 65 and older	592.7	474

Target setting method: Better than the best for 15-28a; 20 percent improvement for 15-28b. (Better than the best will be used when data are available.)

U.S. Data Source: National Hospital Discharge Survey (NHDS), CDC, NCHS.

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How are different populations affected?

Over two-thirds of those with osteoporosis or low bone mass in Michigan are women. More non-Hispanic white women and Asian women are afflicted with this disease, with 20% of non-Hispanic white and Asian women age 50 and older having osteoporosis. In comparison, 10% of Hispanic women and 5% of non-Hispanic black women have osteoporosis. While the prevalence is higher among non-Hispanic white and Asian women, black women are more likely than white women to die following a hip fracture. Among all women, the risk of hip fracture is equivalent to the combined risk of developing breast, uterine and ovarian cancer.

What other information is important to know?

Osteoporosis is commonly referred to as the "Silent Disease," because it typically progresses without the person's knowledge, and it often goes undiagnosed until a fragility fracture occurs. Fragility fractures are fractures that occur in the absence of trauma or following minimal trauma.

Osteoporosis is seen as a pediatric disease in that failure to maximize bone mass during childhood and young adulthood sets the course for the later development of osteoporosis. In fact, osteoporosis is the result of a lifetime of behavioral, developmental and genetic factors and can affect both women and men at all stages of life. Behavioral risk factors can be addressed through sound prevention and health promotion strategies. Risk factors such as low calcium and vitamin D intake, physical inactivity, cigarette smoking, and excessive alcohol consumption are responsive to modification through health education and promotion. Better prevention, early detection, and risk reduction interventions, combined with advancing medical knowledge and treatment options, have turned osteoporosis from a largely untreatable inevitability of the aging process, into a mostly preventable and certainly treatable disease.

Additional Resources:
- National Osteoporosis Foundation. (2002). America's Bone Health: The State of Osteoporosis and Low Bone Mass in Our Nation. Washington, DC.
- Vital Records & Health Data Development Section, Michigan Department of Community Health.
- Burge RT, Worley DJ, King AB. (2000). The cost of osteoporosis in Michigan. Michigan Public Health Institute and Procter & Gamble Pharmaceuticals.
- Michigan Department of Community Health. (2003). Michigan Inpatient Hospital Database.

Healthy Lifestyles

Spending on healthcare is a major concern for this country, but the amounts that will be needed in another 10 - 20 years if adults continue to develop chronic diseases and disabilities at current rates will greatly outweigh current spending. The current lifestyles of most adults and children include too little physical activity and unhealthy diets. These two behaviors have contributed to the current **epidemic** of **overweight** and **obesity** in Michigan.

Significant percentages of Michigan residents also are addicted to tobacco products or are exposed to environmental tobacco smoke, and too many drink alcohol in excess. Many also are experiencing significant mental and emotional stress. All of these behaviors are considered health risks that eventually lead to the development of illness and disease. However, behaviors can be changed through interventions directed at individuals, families, communities, healthcare providers, employers, insurers, and policymakers.

Physical Activity

Overview of Physical Activity

Regular physical activity is one of the most powerful preventive health behaviors. Research shows that people who are physically active are less likely to develop cardiovascular disease, diabetes, colon cancer, osteoporosis and obesity. Exercise improves immunity to minor illness, can prevent or delay some of the physical deterioration generally attributed to aging, and it contributes to an improved sense of well-being. Physical activity is as effective for some forms of depression as drug treatment. In 1993 the Centers for Disease Control and Prevention and the American College of Sports Medicine recommended, "All American adults should accumulate 30 minutes or more of moderate-intensity physical activity most, preferably all, days of the week."

Despite the recognized value of physical activity, the majority of adults do not get enough to meet even the modest recommendation. The widespread failure of Michigan residents to incorporate regular physical activity into their lives is partly due to environments where physical activity has been largely removed from our lives. Technologies such as escalators and riding lawn mowers, and increasingly sedentary jobs, require little energy. Furthermore, the increasing amount of time we spend in our automobiles is a primary factor leading to inactivity. Today, one out of every four trips is short (one mile or less) and yet 75% of the time they are made with an automobile. In 20 years, foot travel dropped 42% for adults. Children are less active in today's world, where television, computer games, and concerns about safety limit spontaneous play. Physical education is limited in Michigan schools and walking and biking trips to school have dropped 40% over the past 20 years.

How is Michigan doing?

In 2002, the majority (53%) of Michigan adults self-reported amounts of **leisure time physical activity** lower than the recommended 30 minutes of activity five or more days a week, and 24% reported no leisure time physical activity at all. The percentage of Michigan adults having no leisure time physical activity has remained reasonably constant from 1994 through 2002. In Michigan, one-third of students in grades 9 to 12 did not participate in the recommended amount of both **moderate and vigorous physical activity** during the week.

How does Michigan compare with the U.S.?

Among Michigan adults, rates of physical inactivity are slightly lower than rates reported for the U.S. Among Michigan high school students, levels of physical activity parallel closely those students in the U.S. that participated in the national Youth Risk Behavior Survey, 2001.

Healthy People 2010 goals:

> **22-1.   Reduce the proportion of adults who engage in no leisure time physical activity.**
>
> **Target:** 20 percent.
>
> **U.S. Baseline:** 40 percent of adults aged 18 years and older engaged in no leisure-time physical activity in 1997 (age-adjusted to year 2000 standard population).
>
> **Target setting method**: Better than the best.
>
> **U.S. Data Source:** National Health Interview Survey (NHIS), CDC, NCHS.

22-6.	**Increase the proportion of adolescents who engaged in moderate physical activity for at least 30 minutes on five or more of the previous seven days**.

Target: 35 percent.

U.S. Baseline: 27 percent of students in grades 9 through 12 engaged in moderate physical activity for at least 30 minutes on five or more of the previous seven days in 1999.

Target setting method: Better than the best.

U.S. Data Source: Youth Risk Behavior Surveillance Survey (YRBSS), CDC, NCCDPHP.

How are different populations affected?

It is somewhat difficult to assess how different populations are affected because populations having less leisure time physical activity tend to report more occupational physical activity. Populations showing decreased physical activity both in leisure and occupation include women, and Michigan residents 65 years old or more. Individuals from low-income households tend to report low levels of leisure-time physical activity but higher levels of occupational physical activity. Individuals from higher income households (over $35,000), report more leisure time physical activity, and, at over $50,000, a marked drop in occupational physical activity is reported.

What other information is important to know?

A 2003 report showed that the four million Michigan adults who are physically inactive generated costs of nearly $8.9 billion in 2002 or $1,175 for each adult resident. These costs are borne largely by employers, through health insurance premiums and lost productivity, and through Medicaid payments.

Regular physical activity is important for weight control. However, even with no weight loss, increasing physical activity can improve blood pressure, blood glucose, bone strength, and mental health.

Additional Resources:
- Richard E. Killingsworth and Jean Lamming. (July 2001). Development and Public Health: Could Our Development Patterns be Affecting Our Personal Health? Urban Land.
- Michigan Department of Community Health. (May 2003). Michigan Behavioral Risk Factor Surveillance Survey, Preliminary estimates.
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- Health Risk Behaviors in the State of Michigan, 2001.
- Behavioral Risk Factor Surveillance System. Summary Results, 2001, United States, http://www.cdc.gov/nccdphp/dash/yrbs/2001/summary_results/
- Michigan Department of Community Health. (2002). Michigan Behavioral Risk Factor Surveillance Survey. Preliminary estimates.
- Vital Records & Health Data Development Section, Michigan Department of Community Health. www.michigan.gov/mdch.
- Michigan Fitness Foundation. (2003). The Economic Cost of Physical Inactivity in Michigan.

<center>*__Nutrition__*</center>

Overview of Nutrition

Nutrition refers to all the interactions between food and a person. *The Council on Foods and Nutrition of the American Medical Association* defines nutrition as including all facets of food: the nutrients and other substances in food; the action, interaction and balance of these food components as they relate to health and disease; and what happens when a person eats, digests and absorbs food, causing nutrients to be moved to cells and used and the by-products excreted. Nutrition concerns the social, economic, cultural and psychological factors related to food and eating. To fully understand how dietary behavior and strategies impact behavior change, we need to understand food, nutrients in food and, the relationships between food, health, social, cultural and psychological factors affecting people. This is even more important with the explosion of fast food restaurants, dining away from home, marketing influence and the increase in portion sizes.

Good nutrition is even more complex. "*Dietary Guidelines for Americans*" provides advice for healthy Americans age two and older about food choices that promote health and prevent disease. This means that Americans should aim for a healthy weight and use the food pyramid as a guide: choose a diet with a variety of grains daily, especially whole grains; choose a variety of vegetables and fruits daily; choose a diet low in saturated fat and cholesterol and moderate in total fat; choose beverages and food to moderate intake of sugars; and choose and prepare foods with less salt. Alcoholic beverages should be consumed in moderation, if at all. Keep food safe to eat.

Nutritional or dietary factors contribute substantially to the burden of preventable illnesses and premature deaths in the U.S. Dietary factors are associated with four of the leading causes of death and these health conditions are estimated to cost society over $200 billion each year in medical costs and lost productivity. A study reported in 2000 that evaluated the "actual causes of death" identified poor diet and lack of exercise as the second largest contributor to death.

The "*5 A Day for Better Health*" program is a simple, targeted strategy to improve the nutritional habits of Americans and target major chronic diseases. This program provides a broad benchmark for monitoring dietary patterns in Michigan and the U.S. in lieu of more complex dietary questions and surveys.

How is Michigan doing?

Michigan ranks 3rd worst among the states for obesity, almost certainly due to excessive caloric consumption and state residents not following one of the key national standards for healthy diets: consuming five or more servings of fruits and vegetables a day as promoted in "*5 A Day for Better Health*." High rates of nutritional-related diseases, notably cardiovascular diseases and diabetes, strongly suggest dietary deficiencies are widespread in Michigan.

How does Michigan compare with the U.S.?

Seventy-seven percent of Michigan adults eat less than the recommended five servings of fruits and vegetables a day, the same as national rates. Fruit and vegetable consumption is an important part of a diet. Statewide data on overall diet is not available; national surveys, such as **NHANES**, normally do not yield state level data. Thus important dietary information, such as the over consumption of calories, is observed indirectly, through self-reported weight status on the

Michigan Behavioral Risk Factor Surveillance Survey (BRFSS). The state's data on **obesity** suggests that Michigan residents consume more calories than the residents of other states that are less prone to obesity.

Michigan rates of dietary behaviors for older children are virtually the same as U.S. rates, among those states that participated in the Youth Risk Behavior Survey, 2001. In Michigan 13% of high school students were at risk for becoming **overweight**, compared to 14% nationally; 11% were overweight, compared to 10% nationally, 79% ate less than five servings of fruits and vegetables per day, compared to 79% nationally. (The word, "overweight", rather than "obese", is used with children; direct comparisons of data on children and data on adults may be inappropriate.)

How are different populations affected?
Looking at fruit and vegetable consumption, most Michigan residents report consuming less than five fruits or vegetables a day. Individuals 18 - 34 years old reportedly consuming the least fruits and vegetables (approximately 80% ate less than the recommended five servings per day; 75% to 79% of residents 35 - 64 years old also under-consumed these foods, and residents 65 and old reported the best rate, with 60 to 69% of this group eating less than five servings per day. Males are more affected, at 82%, than females, 73%. Using five fruits and vegetables as the cutoff point hides important distinctions since those who consume one a day would be lumped in with those consuming four a day.

What other information is important to know?
Educational programs have been successful in increasing the understanding of the importance of good basic nutrition. The challenge is to make this education available to all segments of our population, given the economic, ethnic and cultural disparities in consumption of food. Emphasis on the growing trend of eating out, fast food and convenience food, and the marketing of food must be considered in encouraging our population to eat a healthy diet.

Additional Resources:
- Michigan Department of Community Health. (January 1989). Basic Nutrition Facts: A Nutrition Reference.
- U.S. Department of Agriculture and U.S. Department of Health and Human Services. (2000). *Nutrition and Your Health: Dietary Guidelines for Americans*. Fifth Edition. U.S. Government Printing Office.
- Centers for Disease Control (November 2000). Healthy People 2010. (Vol 1 and 2). Washington, DC: U.S. Government Printing Office.
- McGinnis et al. (1993). "Actual Causes of Death in the U.S." Journal of the American Medical Association. 270:2207-2212. pp. 43.
- Michigan Department of Community Health. (2000). Michigan Behavioral Risk Factor Surveillance Survey.
- Michigan Department of Community Health. (2002). Michigan Behavioral Risk Factor Surveillance Survey. Preliminary Estimates.

Obesity

Overview of Obesity

A striking health trend in Michigan is the rapid increase in the **prevalence** of overweight and obesity among the entire population. Excess body fat is associated with increased risk for acute and chronic conditions, many of which are leading causes of death and disability. A related trend is the social pressure to achieve slender body shapes that may be biologically unattainable for many people, along with social discrimination against heavier individuals.

Michigan citizens do desire to control their weight. The majority of adults report that they are actively either trying to lose weight (44%) or maintain their weight (38%). The majority of high school students report they are either trying to lose weight (46%), exercising to control weight (61%) or eating less food/lower fat foods to control weight (43%). Of particular concern among high school students, 22% report using dangerous weight loss methods (fasting, vomiting, or taking laxatives). Among high school girls, 28% report these unsafe weight loss practices.

There is agreement that the trend of weight gain needs to be reversed. Individual short-term successes in weight loss are common, but long-term success is rare; 75-95% of people who lose weight regain it within five years. Even the most well-established diet or lifestyle programs have difficulty proving that a majority of their participants maintain weight losses. Weight loss drugs stop working when they are discontinued. Weight loss surgery generally results in long-term weight loss, but its long-term side effects have yet to be adequately documented.

The simultaneous rise in obesity rates and increase in social pressure for excessive slenderness present a complex challenge for the healthcare community wishing to promote healthy body weight. Root causes of the increase in obesity are related to contemporary patterns of fast-paced daily life where physical activity has been engineered out of our lives, and families rely on fast and convenience foods for much of their sustenance. Even without weight loss, improving dietary and exercise patterns has significant benefits such as reducing risk for chronic disease and improving well-being.

How is Michigan doing?

Obesity rates are moving in the wrong direction. In the past ten years, the percent of overweight adults has gone from 35% to 37% and the percent of obese adults has increased from 17% to almost 25%. As of 2002, in Michigan approximately 62% of adults were either overweight or obese. The pattern of increasing weight is seen among Michigan children as well. Official statewide data for younger Michigan children are not available, but in the samples collected in recent years and in high school students studied in the Youth Risk Behavior Survey, Michigan children are similar to children across the nation. Nationally, over the past 30 years, the percent of children who are overweight has tripled. Thirteen percent of Michigan high school students were considered "*at risk* for overweight" and 11% were considered overweight in 2001.

How does Michigan compare with the U.S.?

Michigan is similar to the U.S. regarding obesity. Although Michigan has been among the ten heaviest states for the past 14 years, and currently has the third highest obesity rank in the U.S, the rest of the nation and world have seen this trend of increasing weight. Childhood obesity rates are similar in Michigan to national averages.

Healthy People 2010 goals:

19-2.   Reduce the proportion of adults who are obese.

Target: 15 percent.

U.S. Baseline: 23 percent of adults aged 20 years and older identified as obese (defined as a **BMI** of 30 or more) in 1988-94 (age-adjusted to year 2000 standard population).

Target setting method: Better than the best.

U.S. Data Source: National Health and Nutrition Examination Survey (NHANES), CDC, NCHS.

19-3.   Reduce the proportion of children and adolescents who are overweight or obese.

Target and U.S. Baseline:

Objective	Reduction in overweight/obese children or adolescents*	1988 - 1994 Baseline	2010 Target
		Percent	
19-3a.	Children aged 6 to 11 years	11	5
19-3b.	Adolescents aged 12 to 19 years	11	5
19-3c.	Children and adolescents aged 6 to 19 years	11	5

*Defined as at or above the gender- and age-specific 95th percentile of BMI based on the revised CDC Growth Charts for the U.S.

Target setting method: Better than the best.

U.S. Data Source: National Health and Nutrition Examination Survey (NHANES), CDC, NCHS.

How are different populations affected?
Some demographic groups have higher obesity rates than others. Obesity rates are higher in ages 35-74, blacks, and those with less than a college education or with a household income under $35,000. The group that has consistently had the highest prevalence of obesity in Michigan is black females. The rates of *obesity* for males and females in the Michigan population as a whole are similar while rates of *overweight* are higher for males.

What other information is important to know?
The epidemic of obesity has economic and social implications. One estimate of the national economic cost of obesity (1995) was $99 billion and by 2000, the estimate rose to $117 billion, $61 billion in direct costs and $56 billion in indirect costs. The social burden of obesity is more difficult to describe. Enormous resources are spent on diet programs, exercise equipment and facilities and surgical procedures to reduce weight. Despite the desire for a healthy weight, there is no "cure all" for weight loss.

Additional Resources:
- Michigan Department of Community Health. (2002). Michigan Behavioral Risk Factor Surveillance Survey. Preliminary Estimates.
- Michigan Department of Community Health. (2001). Michigan Behavioral Risk Factor Surveillance Survey.
- Michigan Department of Education. (2001). Youth Risk Behavior Survey. Weight and Nutrition Fact Sheet.
- An Epidemic of Overweight and Obesity in Michigan's African American Women, 2002.

Tobacco

Overview of Tobacco

Tobacco use is the leading preventable cause of **morbidity** and **mortality** in the U.S. Since the first Surgeon General's Report on Tobacco in 1964, there has been a significant increase in research and knowledge of the health effects associated with cigarette smoking. Cigarette smoking causes heart disease, lung disease, stroke, and several types of cancer, including cancer of the lung, mouth, larynx, esophagus, pharynx, cervix, and bladder. Smoking is also associated with numerous health consequences during pregnancy and negative **postnatal** outcomes, including low birthweight, increased risk of sudden infant death syndrome (SIDS), negative behavioral effects in children, and an increased risk of developing cancer as an adult.

The consequences of smoking extend beyond the smoker to the nonsmoker. Secondhand smoke (SHS) is the 3rd leading cause of preventable death in the nation. The U.S. Environmental Protection Agency classifies SHS a Class A carcinogen, meaning that it causes cancer at any level of exposure. The health hazards of SHS were first recognized in the 1972 U.S. Surgeon General's Report. After investigation of numerous populations, the 1986 Surgeon General's Report and a report by the National Academy of Sciences' National Research Council included a review of all the evidence and confirmed the negative health effects of SHS on nonsmokers. Exposure to SHS can cause lung cancer, heart disease and respiratory illness. Serious impacts of SHS among children include bronchitis, respiratory tract infections, reduced lung function and development and exacerbation of asthma.

The impact of tobacco use in Michigan is measured through many indicators, such as smoking **prevalence** and incidence of tobacco-related death and disease. These state indicators are compared to national indicators and the *Healthy People 2010* tobacco use objectives to measure Michigan's tobacco-related health status relative to the nation. Michigan's progress in tobacco control is also monitored through these state and national indicators.

How is Michigan doing?

Cigarette smoking results in over 400,000 deaths in the U.S. each year, representing more than five million years of potential life lost. Tobacco use is the leading cause of preventable disease and death among all populations in Michigan, and causes approximately 14,700 deaths each year. Additionally, about 1,800 Michiganians die annually from exposure to SHS, ultimately resulting in over 16,000 tobacco-related deaths in Michigan each year.

### *How does Michigan compare with the U.S.?*

The adult smoking rate in Michigan has remained constant over the past decade with a slight decrease between 2001-2002 from 26.1% to 24.1% in. In 2001, the percentage of adult smokers in the U.S. was 23.4%, making Michigan's current rates slightly higher than the national average.

Michigan's college-aged population (18-24) has the highest smoking rate at 31.7%. Smoking has significantly increased among this young adult population during the last decade. This increase in college-aged smoking is attributed to increased tobacco industry advertising and promotions targeted to this group.

Figure 18:   Trends in Smoking Among Michigan Adults 1992-2002
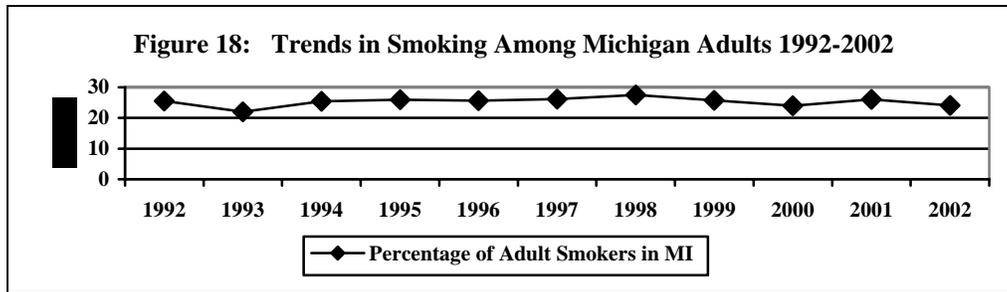

Source: Michigan Behavioral Risk Factor Surveillance Survey

These two graphs represent the proportion of adults who reported that they had *ever* smoked at least 100 cigarettes in their life *and* that they smoke cigarettes now every day or on some days.

Figure 19: Trends in Smoking Among Michigan's College-Aged Adult Population (Ages 18-24) 1992-2002
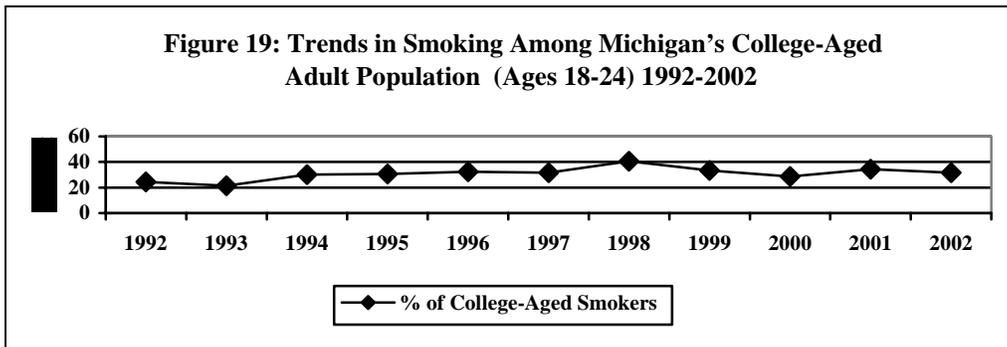
Source: Michigan Behavioral Risk Factor Surveillance Survey

Youth Smoking: The smoking rate among high school-aged youth has declined in the past decade, especially from 1999 to 2001. This decrease may be due to decreased youth access to tobacco through increased enforcement of the Michigan Youth Tobacco Act, an increase in the state tobacco tax that also resulted in higher cigarette prices, and increased involvement of youth in tobacco prevention efforts throughout the state. Baseline data is now available on Michigan's middle school-aged youth (grades 6-8) as the Youth Tobacco Survey was implemented in Michigan for the first time in 2001 and included middle and high school-aged youth. Smoking among Michigan's middle school-aged youth is lower (9.3%) compared to the national average (11%), and smoking amongst Michigan's high school-aged youth is slightly lower (27.6%) compared to the national average (28%). Although the percentage of youth who smoke in Michigan is lower than in the U.S., the average number of youth projected to die from smoking is higher in Michigan than in the nation.

Figure 20: Trends in Smoking Among Michigan Youth, Grades 9-12, 1995-2001
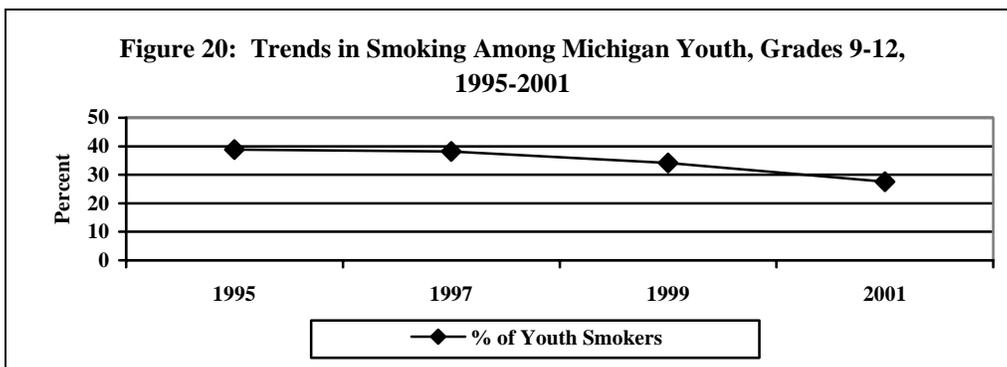
Proportion of youth that smoked cigarettes on one or more of the past 30 days -Michigan Youth Risk Behavior Survey

Table 11: Number of Michigan Youth Projected to Die from Smoking 1999-2000	
# of Michigan youth smokers projected to die from smoking related illness:	255,356
Michigan Projected Death Rate:	9,837/100,000
U.S. Projected Death Rate:	8,830/100,000

Prenatal Smoking: Smoking during pregnancy is the number one cause of preventable illness and death among mothers and infants. Maternal smoking can cause fetal and newborn death, premature birth, low birthweight, infant muscular problems, and cleft lip/palate. Infants born to smoking mothers are three times more likely to die from SIDS, the most common cause of death in infants up to one year of age, compared to babies born to non-smoking mothers. In 2000, 99 Michigan babies died from SIDS. Michigan prenatal smoking rates have declined significantly in the past decade, but Michigan's rate (15.5%) remains higher than the U.S. rate (12.2%).

Figure 21: Trends in Smoking Among All Pregnant Women, Michigan 1992-2001
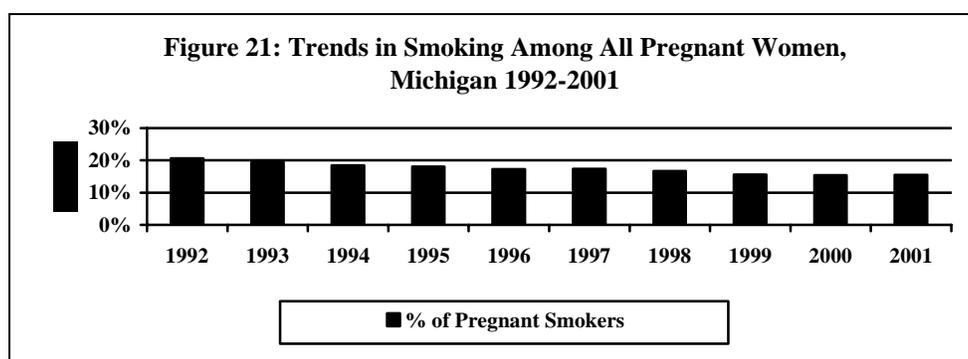
Source: Vital Records & Health Data Development Section, MDCH

***Secondhand Smoke*:** According to the Centers for Disease Control and Prevention (CDC), between 1998-1999, 61% of Michiganians were protected from SHS in the workplace, compared to the U.S. average of 69%. Only 53.5% of people were protected from SHS at home, by having smokers smoke outside of the home, compared to the U.S. average of 61.1%. Michigan ranks 46th of 50 states and District of Columbia in smoke-free worksites and 44th in smoke-free homes.

Healthy People 2010 goals:

27-1   Reduce tobacco use by adults.

Target and U.S. Baseline:

Objective	Reduction in Tobacco Use by Adults Aged 18 Years and Older	1998 Baseline	2010 Target
		Percent	
27-1a.	**Cigarette smoking**	24	12

Target setting method: Better than the best.

U.S. Data Source: National Health Interview Survey (NHIS), CDC, NCHS.

27-2   Reduce tobacco use by adolescents.

Target and U.S. Baseline:

Objective	Reduction in Tobacco Use by students in grades 9 through 12	1999 Baseline	2010 Target
		Percent	
27-2a.	Tobacco products (past month)	40	21

Note: Age-adjusted to the year 2000 standard population.

Target setting method: Better than the best.

U.S. Data Source: Youth Risk Behavior Surveillance Survey (YRBSS), CDC, NCCDPHP.

27-6.   Increase smoking cessation during pregnancy.

Target: 30 percent.

U.S. Baseline: 14% of females aged 18-49 years stopped smoking during the first trimester of pregnancy in 1998.

Target setting method: Better than the best.

U.S. Data Source: National Health Interview Survey (NHIS), CDC, NCHS.

27-10.   Reduce the proportion of nonsmokers exposed to environmental tobacco smoke.

Target: 45 percent.

U.S. Baseline: 65 percent of nonsmokers aged 4 years and older had a serum cotinine level above 0.10 ng/mL in 1988–94 (age-adjusted to year 2000 standard population).

Target setting method: Better than the best.

U.S. Data Source: National Health and Nutrition Examination Survey (NHANES), CDC, NCHS.

27-12.   Increase the proportion of worksites with formal smoking policies that prohibit smoking or limit it to separately ventilated areas.

Target: 100 percent.

U.S. Baseline: 79 percent of worksites with 50 or more employees had formal smoking policies that prohibited or limited smoking to separately ventilated areas in 1998–99.

Target setting method: Retain year 2000 target.

U.S. Data Source: National Worksite Health Promotion Survey, Association for Worksite Health Promotion.

How are different populations affected?

Disparate populations suffer more from tobacco use, as they carry a greater burden of tobacco-related disease. Disparate populations include ethnic groups and other specific populations that have a higher smoking prevalence than the general population, are disproportionately targeted through media and promotions, suffer higher morbidity and mortality rates related to tobacco use, or have less access to adequate healthcare. Black men, for example, are at least 50% more likely to develop lung cancer than white men, and black men have a higher mortality rate from cancer of the lung and **bronchus** (100.8/100,000) than do white men (70.1/100,000). A

workgroup has identified over 40 specific populations in Michigan that are disproportionately affected by tobacco. There has been a lack of surveillance and evaluation for many of Michigan's disparate groups. Therefore, numerous gaps exist in tobacco use data among these specific populations. Without this data, it is difficult to assess needs and effectively reduce tobacco use among Michigan's disparate groups. The table below includes the specific populations identified and corresponding smoking rates, if available.

Table 12: Smoking Rates Among Specific Populations, Michigan	
Population	Percentage that Smokes
African-American	25.3%
Hispanic/Latino	26.4%
Asian-American	29.4%
Arab-American	38.9%
Native-American	42.0%
High-School Students	27.6%
Middle School Students	9.3%
Pregnant Women	15.5%
Data is unavailable for: College students; mentally ill; illicit substance abusers; alcohol abusers; lesbian, gay, bi-sexual, and transgender persons; migrant workers; armed services; blue collar workers; athletes; rural population; inmates; low socioeconomic status; homeless.	

What other information is important to know?

Smoking is responsible for 87% of lung cancers and increases the risk of heart and respiratory disease. Michiganians have more smoking-related deaths compared to other states. Michigan ranks 20th in the nation for smoking-related lung cancer, heart disease and **Chronic Lower Respiratory Disease (CLRD)** combined. Michigan's death rate due to smoking-related lung cancer is slightly lower than the U.S., but Michigan ranks higher in deaths from smoking-related heart disease and CLRD compared to all other states.

Table 13: Smoking-Attributable Deaths in Michigan vs. U.S, 1999		
Disease	Michigan	All States
Lung Cancer	88.6/100,000	90.2/100,000
Heart Disease	71.3/100,000	59.7/100,000
CLRD	66.6/100,000	59.7/100,000
Overall	299.0/100,000	295.5/100,000

To reduce tobacco-related death and disability, the Michigan Tobacco Control Program utilizes an annual strategic plan addressing four focus areas: eliminating exposure to secondhand smoke, increasing cessation among youth and adults, preventing youth tobacco use, and reducing tobacco use among disproportionately affected populations.

Tobacco use has a negative impact on state economies for healthcare costs and employee productivity. Annual healthcare costs in Michigan associated with smoking are estimated at $2.65 billion and the Medicaid program spends nearly $881 million of that amount. Based on this, every household in Michigan bears an average annual financial burden of $557 in state and federal taxes for smoking-related illness. Loss of employee productivity due to smoking is

estimated at an additional $3.4 billion annually, or about $345 in smoking-related costs per person.

Additional Resources:
- U.S. Department of Health and Human Services. Healthy People 2010: Understanding and Improving Health. 2nd ed. Washington, DC: U.S. Government Printing Office, November 2000.
- Michigan Department of Education. Youth Risk Behavior Survey.
- Michigan Department of Community Health. (1999-2002). Michigan Behavioral Risk Factor Surveillance Survey.
- Michigan Department of Community Health. (2001). Michigan Youth Tobacco Survey.
- American Lung Association.
- The Center for Social Gerontology.
- Inter-Tribal Council of Michigan, 2001.
- Centers for Disease Control and Prevention. (2002). State Tobacco Control Highlights.

Overview of Substance Abuse

Abuse of alcohol and illicit drugs is associated with a variety of social concerns including child and spousal abuse, sexually transmitted diseases including HIV, unintended pregnancy, school failure, motor vehicle crashes, escalation of healthcare costs, reduced worker productivity and other disruptions in family and personal life. From a public health perspective, use and abuse of alcohol and drugs causes or impacts chronic disease, poor nutrition, infant mortality and morbidity, the spread of infectious diseases, mental health issues, and injury and violence. From a community perspective, it is estimated that up to 80% of all convicted felons in Michigan have an underlying substance abuse problem that either led to or contributed to their criminality.

Alcohol abuse alone is associated with motor vehicle crashes, homicides, suicides and drowning – the leading causes of death among youth. The Michigan Office of Highway Safety Planning reports that 36% of fatal crashes in 2002 involved drunk and drugged drivers. Use of alcohol during pregnancy causes Fetal Alcohol Syndrome (FAS).

The 2000 Michigan Drug and Alcohol Population Survey, estimates the number of Michigan citizens with alcohol dependency and abuse at over 550,000 and those with illicit drug dependency at 326,000 with an additional 92,000 people classified as illicit drug abusers. **Prevalence** data suggests nearly 100,000 children under the age of 18 are in need of substance abuse treatment.

Selected measures for Substance Abuse address two things: mortality from substance abuse and examining usage patterns among adolescents, (which is the stage in a person's life where use typically begins). These measures are:

1) Number of deaths with underlying cause of alcohol per 100,000 persons (age-adjusted rate);
2) Number of deaths with underlying cause of drugs per 100,000 persons (age-adjusted rate);
3) Percent of adolescents who have tried alcohol and percent who are current drinkers; and
4) Percent of adolescents who have tried illicit drugs and percent who currently use drugs.

While there are instances when young adults die from binge drinking and elevated blood-alcohol levels, a death from drugs or alcohol typically stems from a long-term use, with consequences that impact work, family, and community.

Adolescent lifetime and current use measures provide insight into alcohol consumption and drug use patterns. Of interest is the percentage of adolescents who move from the experimental stage (individual tried it) to the current user/drinker stage (individual used/drank in past month).

How is Michigan doing?

Deaths with alcohol and drug use an underlying cause for Michigan residents rose 9.5% when comparing the three-year periods 1992-1994 to 1995-1997. In the last decade, the age-adjusted rate per 100,000 population for drug deaths has increased 81.8% from 4.4 in 1991 to 8.0 in 2001 in Michigan. For alcohol deaths it has decreased 45% from 9.5 in 1991 to 5.2 in 2001.

The Michigan **Youth Risk Behavior Survey (YRBS)** states that 51% of adolescents in 9th through 12th grades in Michigan schools were current drinkers in 1997. This percentage decreased to 49% in 1999 and then decreased to 46% in 2001. The same surveys showed that

82% had consumed alcohol at least once in their lifetime in years 1997 and 1999. This rate fell to 77% in 2001.

Figure 22: Age-Specific Alcohol Dependency and Poisoning Mortality Rates per 100,000 Michigan Residents, 1992 -2001

Figure 23: Age-Specific Drug Dependency and Poisoning Mortality Rates per 100,000 Michigan Residents, 1992 -2001

Figure 24: Age-Adjusted Alcohol and Drug Dependency and Poisoning Mortality Rates per 100,000 Michigan Residents, 1992 -2001
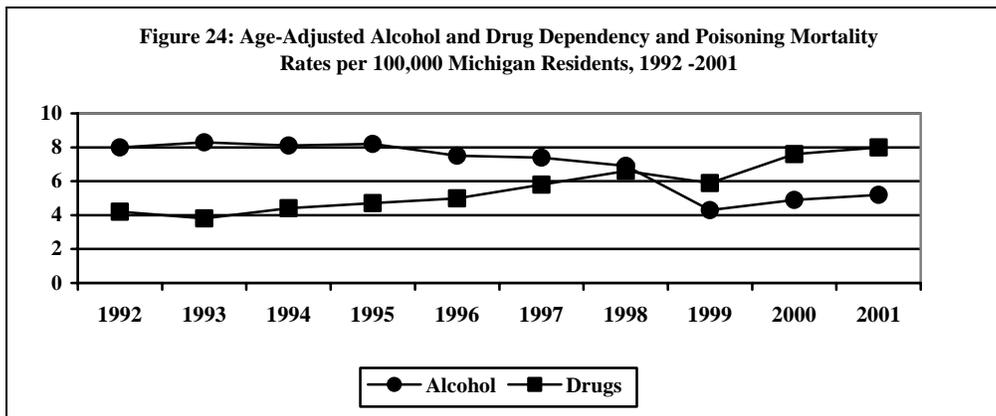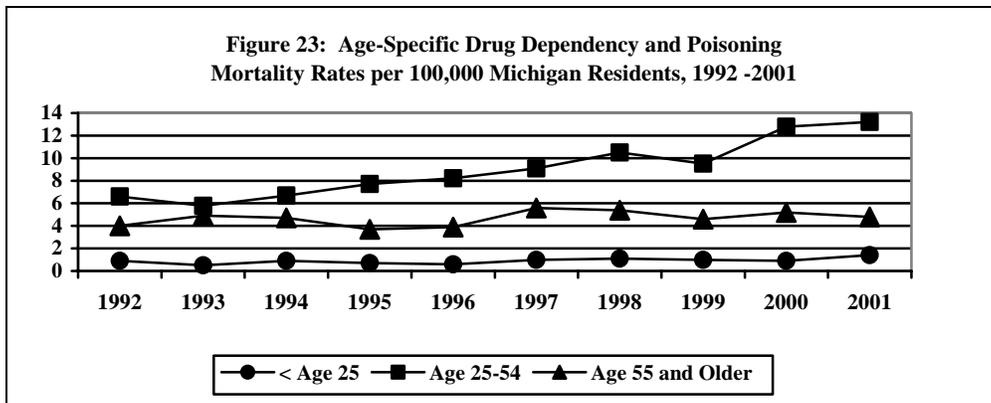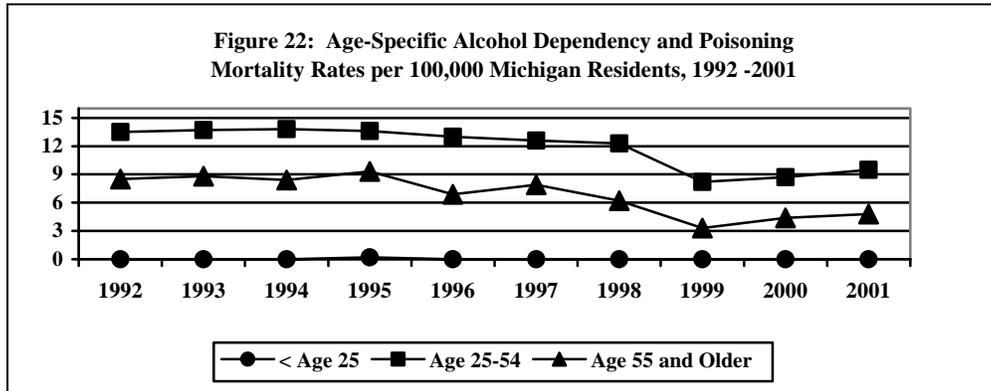
How does Michigan compare with the U.S.?

The percentage of adolescents who identified themselves as having used alcohol is similar to national averages. About one-half of youth nationwide identify themselves as current drinkers. The YRBS for Michigan, however, shows a greater percentage of youth identifying themselves as having used marijuana than national surveys indicate.

Michigan's 1999 age-adjusted rate for deaths with the underlying cause of alcohol of 4.3/100,000 can be compared to the national rate of 7.1/100,000 for that year. A comparison of

Michigan's 1999 drug-induced death rate with the underlying cause of **illicit drugs** (5.9/100,000), to the national rate (7.0/100,000) shows a similar relationship.

Healthy People 2010 goals:

26-1.   Reduce deaths and injuries caused by alcohol and drug-related motor vehicle crashes.

Target and U.S. Baseline:

Objective	Reduction in consequences of motor vehicle crashes	1999 Baseline	2010 Target
		Per 100,000 population	
26-1a.	Alcohol-related deaths	5.9	4
26-1b.	Alcohol-related injuries	113	65

Target setting method: Consistent with the U.S. Department of Transportation (DOT) for 26-1a; 42 percent improvement for 26-1b.

U.S. Data Source: Fatality Analysis Reporting System, DOT, NHTSA; General Estimates System, DOT.

26-2.   Reduce cirrhosis deaths.

Target: 3.0 deaths per 100,000 population.

U.S. Baseline: 9.5 cirrhosis deaths per 100,000 population in 1998 (age-adjusted to year 2000 standard population).

Target setting method: Better than the best.

U.S. Data Source: National Vital Statistics System (NVSS), CDC, NCHS.

26-3.   Reduce drug-induced deaths.

Target: 1.0 death per 100,000 population.

U.S. Baseline: 6.3 drug-induced deaths per 100,000 population in 1998 (age-adjusted to year 2000 standard population).

Target setting method: Better than the best.

U.S. Data Source: National Vital Statistics System (NVSS), CDC, NCHS.

26-4.   Reduce drug-related hospital emergency room visits.

Target: 350,000 visits per year.

U.S. Baseline: 542,544 hospital emergency department visits were drug-related in 1998.

Target setting method: 35 percent improvement.

U.S. Data Source: Drug Abuse Warning Network (DAWN), SAMHSA.

How are different populations affected?
White adolescents were more likely than black and other racial/ethnic group members to indicate current alcohol use (past month) and use of cocaine. White females were as likely as males to have ever tried various illegal substances, but were less likely to report recent or current use.

In Michigan over the past decade, males were 3-4 times more likely than females to have an alcohol-induced death and about twice as likely to die with the underlying cause of illicit drugs as females.

The illicit drug **mortality** rate for blacks over the past decade is around three times higher than that for whites. Black males and females are 2-3 times as likely to have the underlying cause of death of illicit drugs.

For deaths with the underlying cause of alcohol, the rate for blacks is around three times higher than that of whites. However, there has been a reduction of about one-third in alcohol deaths to black males.

What other information is important to know?

The 2001 National Household Survey conducted by the Substance Abuse and Mental Health Services Administration (SAMHSA) Office of Applied Studies states almost half of all Americans age 12 and over are current drinkers and more than one in ten reported driving a vehicle while under the influence of alcohol. Heavy drinking by youths, the most likely age group to engage in binge drinking, is linked to physical fights, destruction of property, high-risk sexual behavior, other criminal activity, and poor academic and employment outcomes. Drug abuse is related to increased injuries, early and unintended pregnancies, academic problems, and the spread of STDs.

Additional Resources:
- Michigan Department of Community Health. (January 2001). State Demand and Needs Assessment Studies.
- Vital Records & Health Data Development Section, Michigan Department of Community Health. www.michigan.gov/mdch.

Overview of Mental Health and Mental Disorders

Mental health is the successful performance of mental function, resulting in productive activities, fulfilling relationships with other people, and the ability to adapt to change and to cope with adversity. Mental health is essential throughout life for personal well-being, establishing and maintaining family and interpersonal relationships, and contributing to community and society. By comparison, **mental disorders** are "health conditions that are characterized by alterations in thinking, mood, or behavior (or some combination thereof) associated with distress and/or impaired functioning."

Mental disorders occur throughout life and affect persons of all racial and ethnic groups, genders, and all educational and socioeconomic groups. In the U.S., approximately 22-24% of persons 18 and older have a diagnosis of mental disorder. Furthermore, at least one in five youth between age 9 and 17 years has a **diagnosable mental disorder** in a given year.

Adults with serious mental illness are persons age 18 and over who currently or at any time in the past year have had a diagnosable mental, behavioral or emotional disorder of sufficient duration to meet diagnostic criteria specified within the **DSM-III-R** that has resulted in functional impairment that substantially interferes with or limits one or more major life activities. A serious emotional disturbance is defined as a mental, behavioral or emotional disorder of sufficient duration to meet the diagnostic criteria specified in the DSM-III-R that results in functional impairment that substantially interferes with or limits one or more major life activities in an individual up to 18 years of age. Several nationally representative studies report that about 5-7% of adults have a serious mental illness in any given year. A similar percentage of children, about 5% to 9%, have a serious emotional disturbance. Applying national percentages to the Michigan population, it is estimated that in the year 2000, more than 412,000 Michigan adults had a serious mental illness.

It is estimated that one in four individuals over 55 experience mental disorders such as anxiety, depression, dementia, and substance abuse. Alzheimer's disease affects 8% to 15% of people over age 65 with the number of cases in the population doubling every five years of age after age 60. Alzheimer's disease may be responsible for 60 to 70% of all cases of dementia and is one of the leading causes of nursing home placements.

Social and Economic Impact of Mental Disorders

When left untreated, the consequences for individuals diagnosed with mental disorders, for their families, and for society are staggering: distress, unnecessary disability, unemployment, the disruption of family life, social isolation, substance abuse, incarceration, homelessness, suicide, and wasted lives.

While the effects of mental disorders on individuals and families have long been recognized, only recently did the social and economic impact of these illnesses on society at large become clear. According to the Global Burden of Disease (GBD) study, mental disorders ranked second in the overall burden of disease in established market economies in 1990. Until the publication of the GBD study, the impact of mental disorders on health and productivity had been profoundly underestimated.

The measure developed to quantify the burden of disease in the GBD study is the "Disability Adjusted Life Year (DALY). A DALY allows for direct comparison of the disease burden of physical illnesses and mental disorders. A DALY is a measure that expresses years of life lost to premature death and years lived with a disability of specified severity and duration. One DALY is one lost year of healthy life. By comparison, the "burden of disease" may be thought of as the gap between current and ideal population health status. Table 14 presents data on the magnitude of disease burden by selected illness for established market economies in 1990.

Table 14: Disease burden by selected illness categories in established market economies in 1990	
Selected Illness Category	**% of Total DALYs**
All cardiovascular conditions	18.6%
All mental illness (including suicide)	15.4%
All malignant diseases (cancer)	15.0%
All respiratory conditions	4.8%
All alcohol use	4.7%
All infectious and parasitic diseases	2.8%
All drug use	1.5%

Since publication of the original GBD, The World Health Organization (WHO) has undertaken a new assessment of the global burden of disease for the year 2000. Mental disorders are now ranked first among illnesses that cause disability in the U.S., Canada, and Western Europe. Among all mental disorders, major depression accounts for 4.4% of all DALYs, making it the fourth leading cause of DALYs following lower respiratory infections (6.4%), perinatal conditions (6.2%), and HIV/AIDS (6.1%). By 2020, if current trends continue, depression is projected to become the second leading cause of DALYs lost. Other mental disorders that contribute significantly to the global burden of disease include schizophrenia, bipolar disorder, panic disorder, and obsessive-compulsive disorder.

Another way to understand the impact of mental disorders on society is to estimate the direct and indirect cost in dollars. In the U.S., the annual indirect cost of mental disorders is estimated to be $79 billion dollars - most of which is attributable to the loss of productivity as a result of illness. In 1997, the latest year for which comparable data are available, the U.S. spent approximately $71 billion, out of more than $1 trillion in total healthcare expenditures, to treat mental disorders. In Michigan in 2002, the Department of Community Health spent $832 million to treat mental illness in community and institutional programs.

Treatment of Mental Disorders
The best, evidenced-based treatments and programs for serious mental illness are effective in reducing symptoms and promoting the restoration of a meaningful and productive life. Promising interventions for adults with mental illness are: pharmacological treatments that adhere to evidence-based guidelines, training in illness self-management, **family psycho-education**, case management based on the principles of assertive community treatment, supported employment, and substance abuse treatment integrated with mental health treatment. For children and adolescents with serious emotional disturbance, promising interventions include: appropriate pharmacological treatment, wraparound services, case management, multi-systemic treatment, cognitive-behavioral therapy, and behavioral family/parent training. Michigan's public mental

health system was among the first to offer these types of services to support recovery and the individual's inclusion in the community.

While a range of treatments, programs, and supports have been shown to be effective in treating mental disorders, these interventions often are not available in the communities where people seek care. As the Report of the U.S. Surgeon General concluded, "state of the art treatments, carefully refined through years of research, are not being translated into community settings." There remains a large gap between what research has shown to be effective and what is offered in most practice settings.

The delivery of effective services is hindered further by the pervasive stigma attached to mental disorders. Stigma erodes confidence among the general population that mental disorders are real, treatable health conditions. It reduces the public's willingness to provide adequate financial support to provide mental health services. It often deters those in need of care from seeking it.

Overview of Suicide Indicator
Suicide is defined as death caused by purposely self-inflicted injuries. Deaths are classified as suicide even if the person did not intend the injuries to result in death. Almost all people who kill themselves have a diagnosable mental or substance abuse disorder or both, and the majority have depressive illness. Among younger adults in Michigan it is a leading cause of death. The most promising way to prevent suicide and suicidal behavior is through the early recognition and treatment of depression and other psychiatric illnesses.

How is Michigan doing?
Suicide is the eleventh leading cause of all deaths in Michigan and the fourth leading cause of **Years of Potential Life Lost (YPLL)** for people below the age of 75.

In 2001, suicides accounted for 1,045 deaths in Michigan. The age-adjusted rate for suicide was 10.6/100,000 population. The rate did not fluctuate much over the ten years from 1992-2001, with a low of 9.8 in 1998 and a high of 11.4 in 1992.

How does Michigan compare with the U.S.?
Michigan's 2001 age-adjusted suicide rate of 10.6 was equal to the U.S. rate. In the U.S., suicide was the 11th leading cause of all deaths in 2001 and the fifth leading cause of YPLL; it is estimated that nationally there were 116.2 nonfatal injuries per 100,000 persons resulting from suicide attempts seen in emergency departments that year.

Healthy People 2010 goals:

18-1. Reduce the suicide rate to 6.0 suicide deaths per 100,000 population.

Target: 5.0 suicides per 100,000 population.

U.S. Baseline: 11.3 suicides per 100,000 population occurred in 1998 (age-adjusted to year 2000 standard population).

Target setting method: Better than the best.

U.S. Data Source: National Vital Statistics System (NVSS), CDC, NCHS.

> **18-2.   Reduce the rate of suicide attempts by adolescents to a 12-month average of 1%.**
>
> **Target:** 12-month average of 1 percent.
>
> **U.S. Baseline:** 12-month average of 2.6 percent of adolescents in grades 9 through 12 attempted suicide in 1999.
>
> **Target setting method:** Better than the best.
>
> **U.S. Data Source:** Youth Risk Behavior Surveillance Survey (YRBSS), CDC, NCCDPHP.

How are different populations affected?

Suicide was the third leading cause of death in Michigan for ages 15-34 in 2001 and the second leading cause for white males in that age group. While suicide is a leading cause of death for 15-34 year-olds, the suicide rates are highest for white males age 75 and older (36.6/100,000).

In 2001, whites in Michigan were almost one-and-a-half times as likely as blacks to commit suicide (11.2/100,000 vs. 6.8/100,000). Michigan men were four-and-a-half times more likely to commit suicide than women (18.0/100,000 and 4.0/100,000, respectively).

What other information is important to know?

- Suicide is considered a possible complication of depressive illness in combination with other risk factors. However, most people who are depressed do not kill themselves.
- Over 50% of suicides in Michigan are committed with a firearm. A firearm in the home is a risk factor for adolescent suicide and is the most common suicide method for elderly men.
- The 2001 Michigan Youth Risk Behavior Survey states that 18% of Michigan's 9th-12th graders seriously considered attempting suicide some time in the 12 months preceding the survey (23% of females). One of ten students actually attempted suicide during that time.
- A study conducted in a large urban emergency department (ED) found that two-thirds of the women seen in the ED for suicide attempts were victims of intimate partner violence.

Additional Resources:

- Department of Health and Human Services, 1999.
- DSM-III-R. Regier, Narrow, & Rae, 1993.
- Kessler, R.C., McGonagle, K.A., Zhao, S., Nelson, C.B., Hughes, M., Eshleman, S., 1994.
- Kessler, Berglund, Zhao, Leaf, Kouzis, Bruce et al., 1996.
- Shaffer, Fisher, Dulcan, 1996.
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- Farmer, E.M.Z., Mustillo, S., Burns, B.J., & Costello, E.J., 2003.
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- Lebowitz, Pearson, & Cohen, 1998.
- National Alliance for the Mentally Ill, 2003.
- Murray & Lopez, 1996.
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health, United States, 1996. (pp. 71-78). Washington D.C.: Center for Mental Health Services. DHHS Pub. No. (SMA) 96-3098. U.S. Government Print Office.

- Kessler, R.C., McGonagle, K.A., Zhao, S., Nelson, C.B., Hughes, M., Eshleman, S., et al., 1994. Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the U.S. *Archives of General Psychiatry,* 51, 8-19.
- Kessler, R.C., Berglund, P.A., Zhao, S., Leaf, P.J., Kouzis, A. C., Bruce, M.L. et al., 1996. The 12-Month prevalence and correlates of Serious Mental Illness (SMI). In R.W. Manderscheid & M.A. Sonnenschein (Eds.), *Mental health, United States, 1996.* (pp. 59-70). Washington D.C.: Center for Mental Health Services. DHHS Pub. No. (SMA) 96-3098. U.S. Government Print Office.

Overview of Maternal and Child Health

This chapter addresses issues concerning pregnancy planning, pregnancy outcomes and infant, child and adolescent health. Key indicators within this chapter include: adequacy of prenatal care, low birthweight, fetal and infant **mortality**, **Sudden Infant Death Syndrome (SIDS)**, breastfeeding, maternal mortality, percent of children age 0-6 screened for lead poisoning, access to care for adolescents, and teen pregnancy. In addition, disparities exist within health indicators between white populations and other racial/ethnic groups. Racial disparities and access to healthcare for mothers and children are important issues to be addressed.

Unintended pregnancy has serious social and economic costs that can be measured by increased infant mortality and **morbidity**, reduced educational attainment and employment opportunity, greater welfare dependency, increased potential for child abuse and neglect, and increased healthcare expenses. According to **Pregnancy Risk Assessment Monitoring System** (**PRAMS**) data, 40.2% of all live births in Michigan in 2000 resulted from unintended pregnancies and 70.7% of live births to teenaged women were unintended.

Children's health status is affected by a variety of factors related to growth and development, child safety, and early detection and treatment of health problems.

- Issues with accessing healthcare can be consistent with low economic status, lack of available health coverage and geographic location. According to the 2000 census, 14.2% of people under age 18 in Michigan were in poverty. Many low-income families are not aware of healthcare services and coverage available to them.
- The leading cause of death for children under one year of age is conditions originating in the **perinatal period** and the leading cause of death for children over one year of age is unintentional injuries. Each year, about 150 Michigan children aged 1-14 years die as a result of injuries due to preventable motor vehicle crashes, falls, fires, drowning, bicycle crashes and poisoning.
- Immunization rates are an important indicator of child health status.
- Many young children are at risk for hearing and vision problems, especially children with special healthcare needs. Early detection and intervention can prevent or reverse these problems.
- Access to oral healthcare is a particular problem for low-income children and children with special healthcare needs.
- Access to a **medical home** is critical to the coordination of primary and specialty health services for children with special healthcare needs.

There are many indicators that are measured to determine and improve the health status of Michigan's mothers, infants and children. In this chapter, the indicators reported are merely a snapshot of all of the indicators that are currently measured that analyzes this population.

Overview of Adequacy of Prenatal Care

Improving pregnancy outcomes for mother and baby is the ultimate goal of prenatal care. Prenatal care is the assessment of risk, monitoring health status and pregnancy progress of mother and fetus, implementing protective interventions, risk reduction, health education, and appropriate support and educational referrals. Assessing health status during pregnancy and continuous monitoring identifies risks and potential issues that contribute to poor pregnancy and birth outcomes. The assessment needs to occur at the beginning of the pregnancy, which is why initiating prenatal care early is promoted. As we learn more about improving pregnancy outcome, we need to encourage pre-pregnancy planning with pre-conceptional care. Such care allows for control and improvement of health and lifestyle issues without the concerns and limits of a developing pregnancy.

Prenatal care should begin by the end of the first trimester (three months) of pregnancy. A second standard in prenatal care is the adequacy of the care, as defined by the American College of Obstetrics and Gynecology, as at least 13 prenatal visits for a full-term pregnancy.

Most pregnancies develop well. The small percentage of women who present with risks that contribute to mortality and morbidity need to be identified through risk assessment during prenatal care. Known risk factors are mother's age, race and ethnicity, intendedness of pregnancy, lack of a prenatal care payment source, and pre-existing and potentially developing adverse health and emotional conditions.

How is Michigan doing?

Increasing the percentage of pregnant women receiving **adequate prenatal care** provides the opportunity to improve the health outcomes for mothers and infants. Michigan has not seen a significant increase in adequacy of prenatal care during the last 20 years. The Michigan three-year average for the years 1999-2001 was 75.4% of pregnancies received adequate prenatal care. For 2001, adequate care was higher at 77.4%, **intermediate prenatal care** was 15.0%, and **inadequate prenatal care** was 7.3% of pregnancies.

Michigan has maintained a rate of approximately 80% of pregnancies initiating prenatal care in the first trimester consistently since the early 1970s. There was a slight increase for 2001 when the rate edged up to 82.9%. The most frequent reasons for not getting care as early as recommended are: 1) the mother did not know she was pregnant; 2) could not get an earlier appointment; 3) lack of money; 4) doctor did not start care earlier; and 5) no insurance coverage.

There is room for improvement in assuring early and adequate prenatal care for the population. Of great concern is why more women (82.9%) start care early and yet a smaller percentage (77.4%) has adequate care.

How does Michigan compare with the U.S.?

Michigan's percentage of live births with prenatal care beginning in the first trimester is 82.9%, consistent with the U.S. 83%.

Healthy People 2010 goals:

16-6.	**Increase the proportion of pregnant women who receive early and adequate prenatal care.**		

Target and U.S. Baseline:

Objective	Increase in Maternal Prenatal Care	1998 Baseline	2010 Target
		Percent of Live Births	
16-6a.	Care beginning in first trimester of pregnancy	83	90
16-6b.	Early and adequate prenatal care	74	90

Target setting method: Better than the best.

U.S. Data Source: National Vital Statistics System (NVSS), CDC, NCHS.

How are different populations affected?

The Pregnancy Risk Assessment Monitoring System (PRAMS) demonstrates that receiving early and adequate care improves with the women's age and education but varies by race/ancestry and financial status. The younger the women, the larger the risk of not receiving care early or not having adequate care. Blacks and Hispanics are more likely to have inadequate care. Women whose prenatal care is paid for by Medicaid are more likely to have inadequate care.

Age, race, education, and marital status have significantly impacted the percentage of the population receiving adequate prenatal care. The following chart demonstrates the differences in the percentage of the groups who began prenatal care in the first trimester:

Table 15: Percent of Specified Population Beginning Prenatal Care in the 1st Trimester		
Age	19 years old and under	62.8%
	20-29 years old	86.6%
	30 years old and older	91.1%
Race	Black	72.3%
	Non-black	87.9%
Education	Less than high school graduate	66.0%
	High school graduate	83.5%
	Some college	91.3%
	College graduate	93.9%
Marital Status	Married	89.4%
	Other	65.0%
Medicaid Paid Prenatal Care	Yes	89.4%
	No	90.8%

What other information is important to know?

Pre-term births are less prevalent in women with more education, more prenatal care, women who don't smoke or drink alcohol, and in singleton (single infant) births. The most frequent reason women did not start prenatal care as early as they would have liked is because they were unaware of their pregnancy. With more than 40% of women who deliver a live infant resulting from pregnancies that were unintended (both mistimed and unwanted), it is important to address unintended pregnancy issues to improve the adequacy of prenatal care.

Additional Resources:
- Michigan Department of Community Health. (2002). Pregnancy Risk Assessment Monitoring Surveillance.

- Vital Records & Health Data Development Section, Michigan Department of Community Health. www.michigan.gov/mdch.

Low and Very Low Birthweight Babies

Overview of Low and Very Low Birthweight Babies

Birthweight is the best population-based predictor of infant **mortality** and childhood **morbidity**. Low birthweight (LBW) is defined as a live birth weighing less than 2,500 grams. Very low birthweight (VLBW) is defined as a live birth weighing less than 1,500 grams, and represents a small portion of overall LBW. LBW can be a result of intrauterine fetal growth restriction or a pregnancy lasting less than 37 completed weeks. Despite medical and technological advances, LBW continues to be a public health problem with enormous individual and societal cost. More than 90% of all neonatal deaths are to infants who weigh less than 2,500 grams at birth. About 40% of all the VLBW infants who survive experience long-term health problems.

The most important factors associated with LBW are race, maternal age, delivery history, marital status, socioeconomic factors, prenatal care, smoking and drinking alcohol. Multiple births are also more likely to be LBW. As the rate of multiple births (twins, triplets, etc.) increases, most notably among births to white mothers, the LBW numbers continue to rise.

Efforts to prolong pregnancies past 37 weeks have been largely unsuccessful, as is evident by a parallel increase in both LBW births and preterm births over the last decade. Factors that contribute to increasing rates of preterm births are: increasing rates of multiple births; increasing rates of births to women 35+ years of age; induced deliveries, management of maternal and fetal health conditions, scheduled deliveries, and patient preference; intensive prenatal care utilization; substance abuse, and asymptomatic bacterial and viral infections.

How is Michigan doing?

The percent of live births that were LBW in 2001 was 8.0%, and VLBW was 1.7%. Reducing the **prevalence** of LBW has been difficult in Michigan and the nation. The proportion of LBW births has remained fairly constant over the past 30 years. The prevalence generally declined until 1985 (6.8%) and increased since 1989. In 2001, 768 (Infant Mortality Rate (IMR) (71.7) infants died who were LBW, 635 (IMR 285.8) infants died who were VLBW.

**Figure 25: Mapping Feto-Infant Mortality**
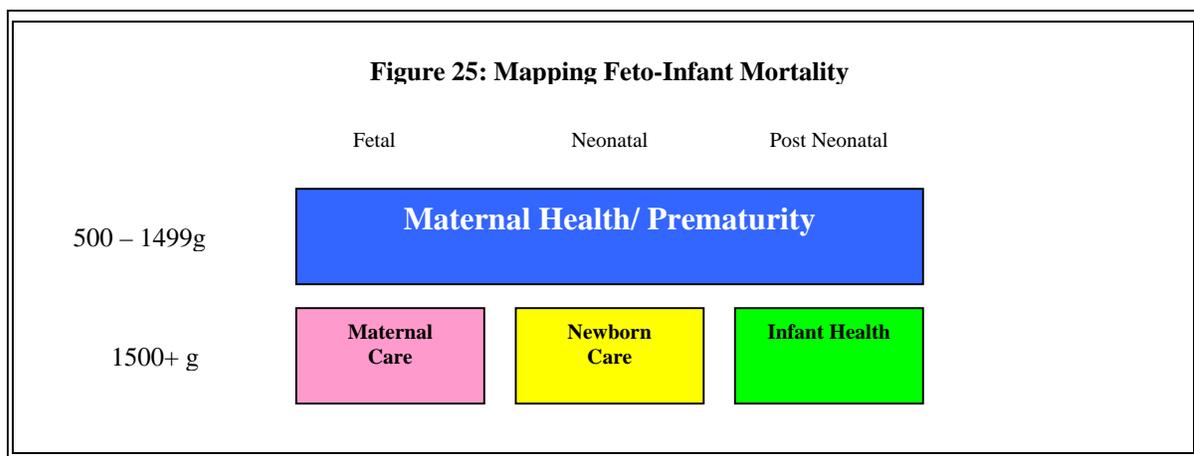
Figure 25 shows the Perinatal Periods of Risk (PPOR) Model, a mechanism that uses birthweight and age at death to predict preventable deaths. The calculation of LBW and gestation of fetal and infant deaths in Michigan for 2000 indicated that 281 deaths were preventable due to VLBW.

The model suggests that improved maternal health would lead to more normal birthweight deliveries. Maternal health is affected by substance use, smoking, infections, chronic illness, mental health, nutrition and genetic predisposition.

How does Michigan compare with the U.S.?

Low birthweight rates have changed little over the last decade. Michigan's percent of live births who are low birthweight was 7.6% in 1990 and 7.9% in 2000. The U.S. was 7.0% in 1990 and 7.6% in 2000. The VLBW rates have also remained constant over this time period, hovering around 1.5% for live births for both Michigan and the U.S.

Figure 26: Low and Very Low Birthweight Births, Michigan and US, 1990-2000
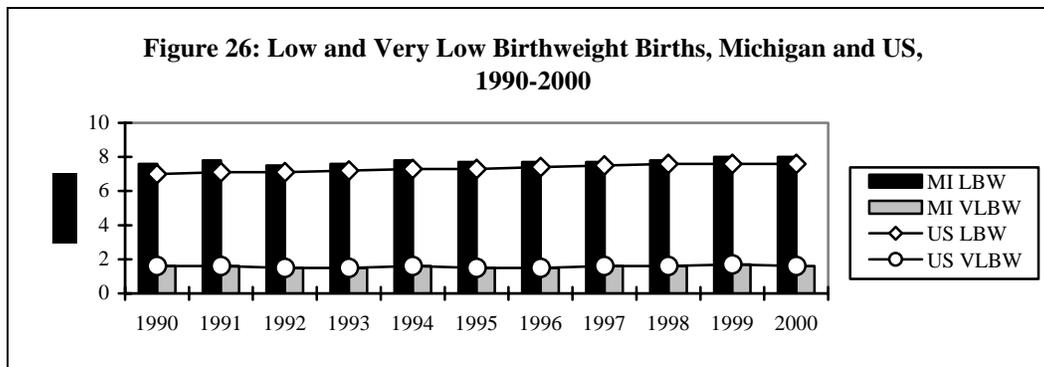
Healthy People 2010 goal:

16-10.   Reduce low birthweight (LBW) and very low birthweight (VLBW).

Target and U.S. Baseline:

Objective	Reduction in Low and Very Low Birthweight	1998 Baseline	2010 Target
		Percent	
16-10a.	Low birthweight (LBW)	7.6	5.0
16-10b.	Very Low birthweight (VLBW)	1.4	.9

Target setting method: Better than the best.

U.S. Data Source: National Vital Statistics System (NVSS), CDC, NCHS.

How are different populations affected?

Although low birthweight is the leading cause of infant mortality for both black and white infants in Michigan, it affects black infants much more than white infants. During the past decade, black infants have been four to five times more likely to die of this condition than white infants. Live births to black mothers in 2001 had the highest proportion of LBW, 14.2%, compared to white (6.7%), American Indian (8.3%), and Asian mothers (7.7%) respectively.

The distribution of LBW by mother's age is a "V" shaped pattern, with the highest proportion in the less than 15 years of age group, to the lowest proportion for mothers aged 25 to 29 years, and back up to another high in mothers of 40 to 44 years of age. Mothers with inadequate prenatal care had 13.7% LBW in 2001, while mothers with adequate care had 7.2% LBW. When multiple births are removed from the LBW calculation the percentage drops to 6.4%.

Figure 27: Mortality rate due to LBW, by race, MI, 1990-2000
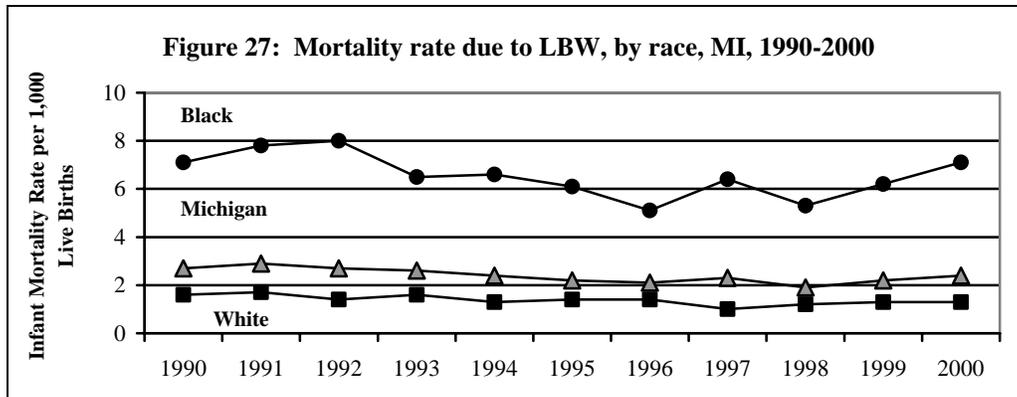
What other information is important to know?

Policies and programs aimed at addressing low birthweight and pre-term delivery have primarily focused on prenatal care utilization. Numerous interventions and programs have been implemented to encourage women to start prenatal care in the first trimester and to receive continuous care throughout the pregnancy. Despite the policy emphasis, however, standard prenatal care is not a strong intervention for reducing LBW rates or for reducing racial or socioeconomic disparities in poor pregnancy outcomes. Instead there is growing interest in promoting pregnancy intendedness and planning for the pregnancy by introducing preconception care. The next challenge for this service will be identification of systems of care as well as means of payment.

A pilot project to study the effectiveness of preconception care for women who have already experienced a fetal or infant loss is being initiated in FY2004. Emphasis will be on putting off the next pregnancy for at least 18 months after a loss, assessing maternal health and ensuring adequate treatment of all medical and mental health problems, evaluating environmental risks, and providing health education and case management during the next pregnancy.

Fetal and Infant Death Rate

Overview of Fetal and Infant Deaths

Fetal deaths, also called stillbirths, are defined as the death of a fetus that has completed 20 weeks gestation or weighs at least 400 grams. Since June 1, 2003, access to fetal death reports has been similar to that of birth certificates, increasing the ability to study these losses.

The infant death rate is made up of two components: neonatal **mortality** (death in the first 28 days of life) and postneonatal mortality (death from the infants' 29th day but within the first year). The leading causes of neonatal death include birth defects, disorders related to short gestation and low birthweight (LBW), and pregnancy complications. The most likely to be preventable are those related to pre-term birth and low birthweight. Prematurity and its complications cause about 20% of neonatal deaths. A high percentage of pre-term births are also low birthweight. The most common cause of neonatal deaths is birth defects (25% of neonatal deaths). Post-neonatal death reflects events experienced in infancy, including SIDS, birth defects, injuries, and homicide. Birth defects, many that are unlikely to be preventable given current scientific knowledge, account for approximately 17% of post-neonatal deaths; the rest are likely to stem from preventable causes.

How is Michigan doing?

Recognizing that the number of fetal deaths each year in Michigan is a largely unexplored problem, the state has embraced the Perinatal Periods of Risk (PPOR) Model for describing feto-infant mortality issues. Using the birthweight and gestational age data for a given jurisdiction, the model determines the proportion of risk for fetal and infant death according to a **perinatal period** (Maternal Health-Prematurity, Maternal Care, Newborn Care, and Infant Health). The calculation provides the number of excess (preventable) deaths in each period. This model has provided information for refocusing data collection and program emphasis on maternal health, particularly health issue prior to conception, and infant health during Michigan's periods of highest number of preventable deaths.

Figure 28: Mapping Feto-Infant Deaths: Michigan 1998

| Maternal Health/ Prematurity 670 | | | 1410 Feto-Infant Deaths |
| Maternal Care 227 | Newborn Care 191 | Infant Health 322 | 134,733 Fetal Deaths & Live Births |

Figure 29: Excess Feto-Infant Deaths for African-Americans, 1998

| Maternal Health/ Prematurity 169 | | | Excess Feto-Infant Mortality: 280 |
| Maternal Care 21 | Newborn Care 17 | Infant Health 72 | |

The combination of fetal and infant deaths allows a more comprehensive assessment of pregnancy outcomes. Recent data analysis suggests that the infant mortality rate (IMR) in

Michigan stopped declining in 1994 and that the most important determinant of the IMR is low birthweight.

The goal of the Infant Mortality Summit in 2001 was to increase awareness and allow time for strategic planning. Local coalitions were formed in many cities and counties and local Infant Mortality Summits and continue to meet to develop further efforts to reduce the number of infant deaths. A statewide Infant Mortality Network meets quarterly to review new data and evaluate current efforts to reduce infant mortality.

How does Michigan compare with the U.S.?

Michigan's rate of infant death has been consistently higher than the U.S. rate. The higher IMR in Michigan is due to a larger racial disparity. The overall IMR in 2001 was 8.0/1000 live births, while the black IMR was 16.9, the white IMR was 6.1 and the IMR for other races was 5.3.

Figure 30: Infant Mortality rate, by race, Michigan vs. US 1990-2000

Figure 31: IMR: Michigan vs. US, 1990-2000

Health People 2010 Objective = 4.5/1,000
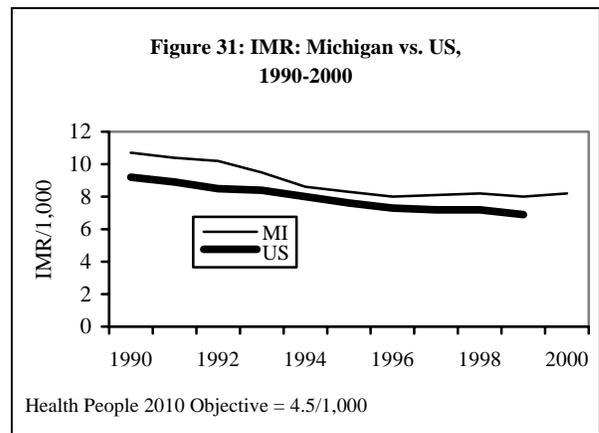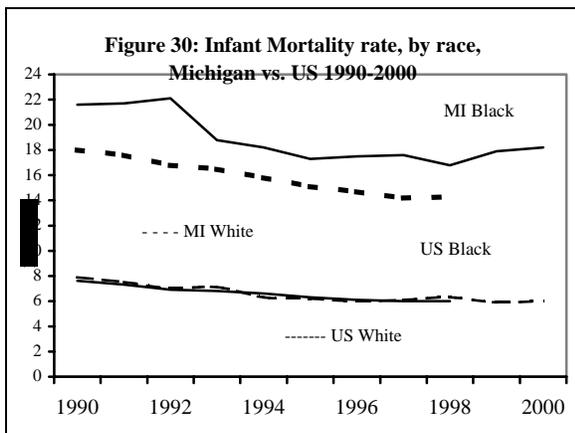
Healthy People 2010 goal:

16-1.	Reduce fetal and infant deaths.		

Target and U.S. Baseline:

Objective	Reduction in fetal and infant deaths	1997 Baseline	2010 Target
		Per 1,000 live births plus fetal deaths	
16-1a.	Fetal deaths at 20 or more weeks of gestation	6.8	4.1
16-1b.	Fetal and infant deaths during perinatal period (28 weeks of gestation to 7 days or more after birth)	7.5	4.5
16-1c.	All infant deaths (within 1 year)	7.2	4.5
16-2d.	Neonatal Deaths (within the first 28 days of life)	4.8	2.9
16-1e.	Post-neonatal Deaths (within 29 day to 1 year of life)	2.4	1.2

Target setting method: Better than the best.

U.S. Data Source: National Vital Statistics System (NVSS), CDC, NCHS.

How are different populations affected?

Multiple risk factors are associated with LBW, such as young maternal age, single marital status, low-income level, **inadequate prenatal care**, smoking and drinking alcohol. Data show that pre-term birth may be the most remarkable contributing factor for LBW in black births, whereas births of multiples (two or more infants simultaneously) to white mothers is the major factor compared with other racial groups.

A comparison study of racial disparity (2003) found that eight Michigan communities accounted for 90% of black live births and infant deaths, and 45% of the white births and white infant deaths in the state. Table 16 shows the disparity that exists in communities.

Table 16: Number of Infant Deaths and IMR by Race: Selected Communities, Michigan, 1995-1999		
	Number to Black/(IMR)	**Number to White/(IMR)**
Berrien County	59 (20.0)	45 (5.7)
Genesee County	188 (21.0)	195 (8.6)
Ingham County	47 (15.5)	85 (5.6)
Kent County	106 (19.7)	228 (5.9)
Oakland County	160 (19.3)	301 (4.5)
Saginaw County	64 (17.5)	59 (5.6)
Out-Wayne County	116 (16.1)	360 (5.5)
Detroit City	1168 (17.1)	79 (5.9)

What other information is important to know?

Fetal-Infant Mortality Review (FIMR) is a surveillance process that identifies and examines factors contributing to fetal and infant death through the systematic evaluation of individual cases. FIMR complements other studies of infant death but uses an approach that is community-based and designed to bring together local health providers, consumers, advocates and leaders. FIMR identifies strengths and areas for improvements in overall service systems and community resources for women, children and families. FIMR also provides direction towards the development of new policies to safeguard the women, children and families. The state FIMR program has two goals: to describe significant social, economic, cultural, safety, health and systems factors that contribute to mortality, and to design and implement community-based action plans founded on the information obtained from the reviews.

SIDS Rates

Overview of Sudden Infant Death Syndrome

Sudden Infant Death Syndrome (SIDS) is the leading cause of death for infants from one month to one year old (the post-neonatal period). How these infants die has been the subject of much research, but continues to be described as a combination of biological, environmental and developmental risk factors. SIDS risk factors mirror other maternal child health risks, such as prenatal smoking, second-hand smoke, premature birth, low birthweight, low income, unmarried mothers, teen mothers, and mothers with less education. In recent years, however, data from investigations of sudden infant death has shown a high correlation between bed sharing with adults and sudden death. Detailed descriptions of sleep environments at the time of death has helped to create a new risk reduction message for sudden infant death, "Save A Life, Sleep Right", that pictures the unsafe environment of sleeping with others, sleeping on the stomach or side, soft bedding, covering the baby's face, smoking around the baby, overdressing or overheating and using poorly fitting mattresses or sheets.

Growing awareness of the inconsistency of services and criteria used to diagnose SIDS and lack of culturally competent services resulted in the convening of a statewide SIDS Task Force, charged with developing a comprehensive program for the state. The final report was distributed in 1996 with findings and recommendations on reporting and surveillance, risk reduction, and family support. It is the blueprint for SIDS services in Michigan.

How is Michigan doing?

Michigan SIDS rates have declined by almost 60% since 1992 when the American Academy of Pediatrics issued a recommendation that infants be placed to sleep on their backs. The reduction in this risk factor was apparently responsible for significant declines in SIDS rates for white babies. There was no significant decline in black SIDS rates until 1999, though black rates continue to be more than twice the white rate.

Figure 32: SIDS Rates Michigan by Race, 1900-2000
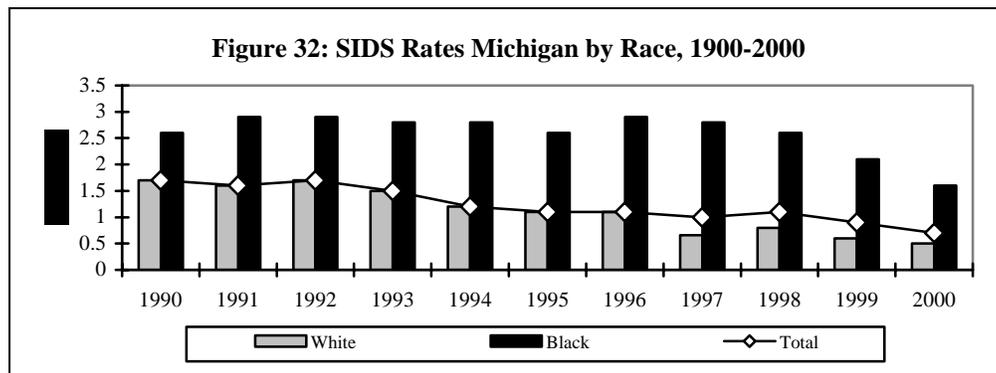
The proportion of Michigan mothers who chose the back sleeping position for their infants rose from 39% to 67% from 1996 to 1999 according to Michigan Pregnancy Risk Assessment Monitoring System (**PRAMS**) data. Older mothers were more likely to use the back sleep position. Women with higher levels of education were most likely to use the back sleep position. Women with lower socioeconomic status were less likely to put their babies to sleep on their back. Black women were two times less likely to use the back position than women of other races.

The *Michigan SIDS and Other Infant Death Program* has followed the back sleep recommendation since 1992. In 1999, an intensive campaign was launched in black communities that included billboards, bus placards, posters, and brochures. An advisory group was also formed in Detroit that continues to recommend strategies for improving the outcomes for black infants in that city, the location of the largest number of infant deaths in the state.

How does Michigan compare with the U.S.?

Michigan's SIDS rate has been traditionally higher than the overall U.S. rate. In 1998, Michigan had the highest SIDS rate of states with numbers of births between 100,000 and 200,000.

Table 17: Sudden Infant Deaths and Mortality Rates per 1,000 births by State, 1998			
	SIDS Deaths	**Births**	**Rate**
United States	**2,827**	**3,941,553**	**.7**
Florida	118	195,637	**.6**
Georgia	98	122,368	**.8**
Illinois	139	182,588	**.7**
Michigan	**148**	**133,649**	**1.1**
New Jersey	37	114,550	.3
North Carolina	98	111,688	.8
Ohio	111	152,794	.7
Pennsylvania	89	145,899	.6

Healthy People 2010 goal:

16-13.   Increase the percentage of healthy full-term infants who are put down to sleep on their backs.

Target: 70 percent.

U.S. Baseline: 35% of healthy full-term infants were put down to sleep on their backs in 1996.

Target setting method: Better than the best.

U.S. Data Source: National Infant Sleep Position Study, NIH, NICHD.

How are different populations affected?

The SIDS rate for black and American Indian infants continues to be two to three times greater than for white infants despite the overall rate reduction. A recent investigation revealed that bed-sharing deaths were twice as common in black infants, as were deaths on nonstandard sleep surfaces, such as mattresses on the floor, or sofas. Another study found that in groups given the same information about risk reduction, black mothers increased the use of pillows, stuffed toys and soft bedding as compared with whites. Focus groups among black inner city families showed us that reducing these risks must involve ethnically and culturally appropriate strategies.

What other information is important to know?

The SIDS program has expanded to include other infant deaths in light of growing evidence that SIDS-like deaths are often labeled with some other cause, restricting the ability to address all risk factors. The program targets the most at-risk groups for education and public awareness. Intervention with families experiencing a loss involves bereavement support and preconception planning for the next pregnancy. Further analysis of the risks is being done through Fetal-Infant Mortality Review, Child Death Review and surveillance of autopsy reports.

Grief support is important for families experiencing a sudden infant loss. Providers also find that education and **anticipatory guidance** given to families after a loss is received in a more positive state. The family is more ready to change behavior for the next pregnancy and to provide infant care.

Additional Resources:
- Unger, et.al. (2003). Racial disparity and modifiable risk factors among infants dying suddenly and unexpectedly. Pediatrics, 111, 2, pp 127-13.
- Vital Records & Health Data Development Section, Michigan Department of Community Health. www.michigan.gov/mdch.
- Rasinski, et.al. (2003). Effect of a sudden infant death syndrome risk reduction education program on risk factor compliance and information sources in primarily back urban communities. Pediatrics, 111, 4, pp 347-354.

Breastfeeding

Overview of Breastfeeding

The lack of breastfeeding is a public health issue in Michigan. Breastfeeding is considered the most complete and biologically normal form of infant feeding. "Human milk is uniquely superior for infant feeding and is species-specific. Epidemiological research shows that human milk and breastfeeding of infants provide advantages with regard to general health, growth, and development, while significantly decreasing risk for a large number of acute and chronic diseases." Breastfeeding benefits our economy by reducing healthcare costs. Recognizing these benefits, the U.S. Surgeon General, the American Academy of Pediatrics and Healthy People 2010 have all adopted breastfeeding policies with common goals: 75% of new mothers initiating breastfeeding and at least 50% continuing to breastfeed at six months duration. Breastfeeding, with appropriate complementary foods, is the preferred form of feeding an infant through at least the first year of life.

How is Michigan doing?

Breastfeeding rates in Michigan have been steadily increasing and reached an all-time high in 2001. According to the 2001 Ross Mothers Survey, 64.3% of Michigan mothers initiated breastfeeding their infants as compared to 69.5% of mothers nationwide (Figure 33). There has been a positive trend for breastfeeding rates in Michigan from 1991 (48.8%) to 2001 (64.3%). The six-month breastfeeding rate was 26.5% in Michigan, increasing from the rate of 15.9% in 1991.

When families, healthcare providers, workplaces and communities join together to promote, support, and protect breastfeeding, rates increase. The Mother-to-Mother Program, a partnership between Michigan **Women, Infants, and Children** (**WIC)** program and Michigan State University Extension, is in 17 counties. During the FY01-02, approximately 90% of women enrolled in the program initiated breastfeeding compared to 46% of women in the overall Michigan WIC population. Sixty-one percent of mothers who initiated breastfeeding were still breastfeeding at two months, compared to 36% of the Michigan WIC population. The average duration of breastfeeding among Mother-to-Mother participants is 20 weeks**.**

Figure 33: In-Hospital Breastfeeding Rates, Ross Mothers Survey 2001

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
US	53.3	54.2	55.9	57.4	59.7	59.2	62.4	64.3	67.2	68.4	69.5
MI	48.8	50.6	51	53.2	53	53	56.8	59.4	63.3	63.1	64.3
US WIC	36.9	38.8	41.6	44.3	46.6	46.6	50.4	56.8	56.1	56.8	58.2
MI WIC	33.5	35.8	37.2	41.5	37.5	39	42.9	46.4	50.3	50.1	51.5
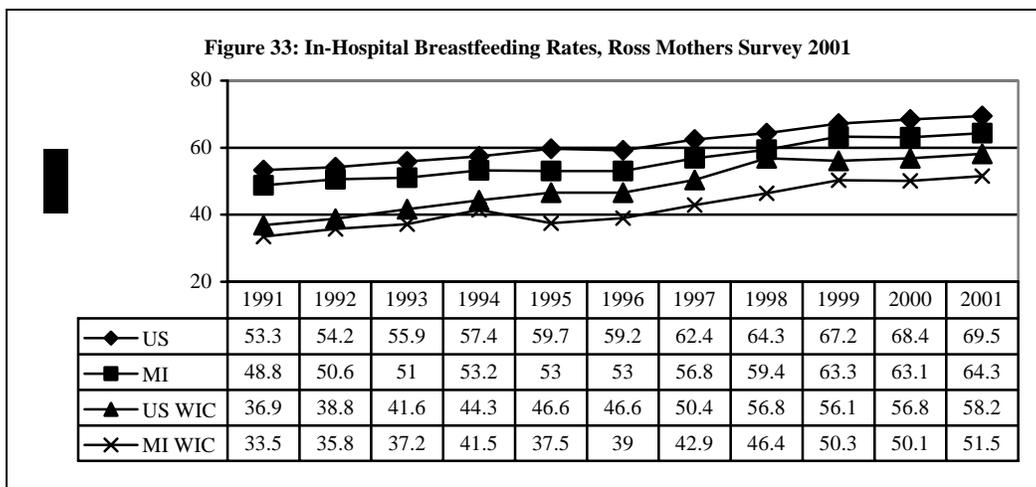
How does Michigan compare with the U.S.?

The 2001 breastfeeding initiation rate in the U.S. was reported to be 69.5%, ranging from a high of 88.5% in Hawaii to 50.4% in Mississippi. Michigan's rate was 64.3%. The six-month duration rate in 2001 was 32.5% for the U.S. ranging from a high of 57% in Vermont to 17.3% in Arkansas. Michigan's rate was 26.5%.

Healthy People 2010 goals:

16-19.   Increase the proportion of mothers who breastfeed their babies.

Target and U.S. Baseline:

Objective	Increase in Mothers who breastfeed	1998 Baseline	2010 Target
		Percent	
16-19a.	In early postpartum period	64	75
16-19b.	At 6 months	29	50
16-19c.	At 1 year	16	25

Target setting method: Better than the best.

U.S. Data Source: Mothers' Survey, Abbott Laboratories, Inc., Ross Products Division.

How are different populations affected?

The 2000 Michigan Pregnancy Risk Assessment Monitoring System (PRAMS) reported a positive relationship between mothers' age and the breastfeeding rate with 47.6% of mothers age 20 or younger breastfeeding their infants as compared to 78.2% of mothers 30 years of age or older. The likelihood of breastfeeding reportedly increases with mothers' education levels ranging from 40.9% for mothers with less than a high school education to 86.1% among mothers with a college degree. There was also a disparity in breastfeeding rates between the black (49.2%) and the non-black population (70.5%).

The lowest rates of breastfeeding are found among the low-income population, the group whose infants are at the highest risk of poor health and development. Approximately half of the babies born in Michigan are Women, Infants and Children (WIC) program eligible. According to the 2001 Ross Mothers' Survey, the rate of breastfeeding among Michigan WIC mothers is 51.5% compared to 33.5% in 1991 and the six-month duration rate is 14.9%, increasing from 9.2% since 1991 (Figure 33). The 2001 Michigan Pregnancy Nutrition Surveillance System (PNSS) report indicates an increased breastfeeding rate with age and higher education levels (Figure 34). Breastfeeding rate is reported to be highest among mothers with Hispanic ethnicity (65.3%) and lowest among black mothers (32.6%).

Figure 34: Breastfeeding rate by age, race and education level
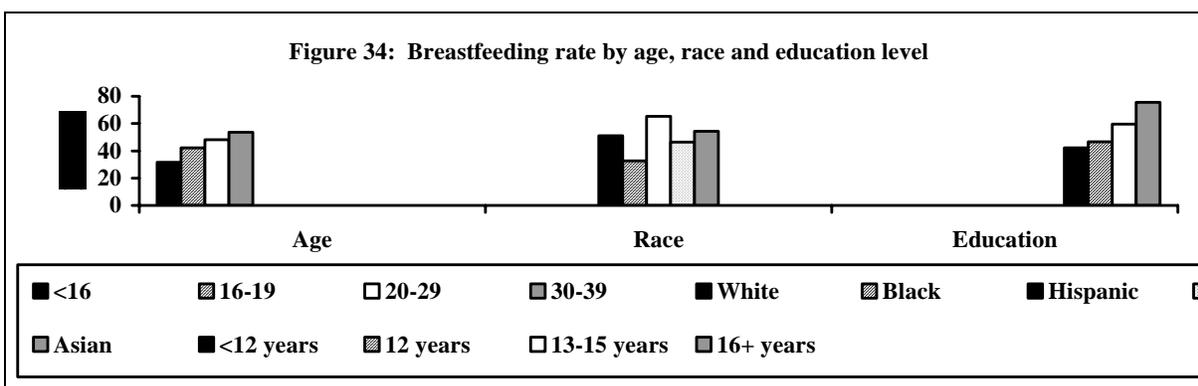
Source: 2001 Michigan Pregnancy Nutrition Surveillance System (PNSS) report.

There are variations in breastfeeding rates among Michigan WIC agencies with the rates ranging from 71.5% in Grand Traverse County to 30.4% in Genesee County (Figure 35).

Figure 35: Breastfeeding Initiation by Local WIC Agencies and Michigan, PNSS

Grand Traverse	Benzie	Chippewa Co.	State, MI	Muskegon	Detroit	Genesee
71.5	63	61.9	43.1	35.8	31.6	30.4
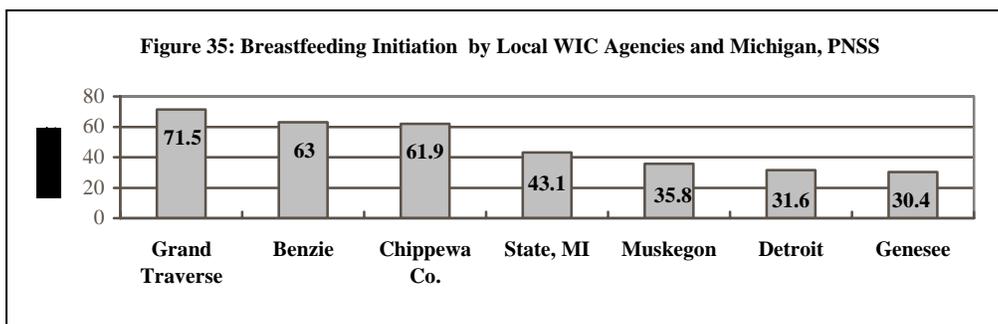
What other information is important to know?

Michigan could save millions of dollars each year with higher breastfeeding rates. In treatment costs of just three infant/childhood diseases (ear infections, **gastroenteritis** and **necrotizing enterocolitis**), the U.S. could save $3.6 billion a year by meeting the 2010 breastfeeding goals. Additional savings could be seen in reduced rates of childhood and adult **obesity**, allergies, asthma and chronic diseases such as diabetes, heart disease and cancer. A child who is breastfed has greater resistance to infectious disease, an enhanced immune system, and reduced risk for chronic disease such as diabetes, **celiac disease**, inflammatory bowel disease, childhood cancer, allergies and asthma. A breastfed child has better cognitive function and visual acuity.

Women who breastfeed their children are at lower risk of osteoporosis and heart disease. Studies show that women who breastfeed for up to two years may reduce their risk of breast cancer and ovarian cancer. Breastfeeding mothers have better emotional health, postpartum weight loss and diabetes control.

Breastfeeding impacts Michigan's economy in other ways:
- Parents of breastfed children miss fewer days of work because their children are healthier.
- Employers see increased worker productivity and potentially lower health insurance premiums.
- Resources are needed to produce formula and dispose of formula waste (bottles and cans). Breastfeeding is direct delivery of the original fast food without the waste.
- Infant formula costs run from $1,160 to $3,915 per year, per infant, who is not breastfed.

Additional Resources:
- American Academy of Pediatrics Workgroup on Breastfeeding. Breastfeeding and the use of Human Milk. (1997). (RE9729). J. Pediatrics, 100: 1035-1039.
- Weimer, J. (March 2001). The economic benefits of breastfeeding: A review and analysis. ERS Food Assistance and Nutrition Research Report, No. 13. pp 20.
- Ross Product Division, Abbott Laboratories. Mothers Survey, 2002.
- Health and Human Services Blueprint for Action on Breastfeeding, Department of Health and Human Services. Office on Women's Health, 2000.

Lead Poisoning

Overview of Lead Poisoning

Lead is the most common environmental toxin that children face today. It can be found in paint made before 1950, in dirt and dust around industrial sites and deposits from car emissions before lead-free gas standards were imposed. Children under age six are most at risk because they engage in behaviors that are likely to make them ingest sources of lead (chewing on fingers, pacifiers etc.) that are contaminated with lead laced dirt and soil. Lead exposure has the most devastating effect on children due to the early, rapid development and differentiation that takes place in their brains and neurological systems. One and two-year-old children are at greatest risk, and damage done by exposure to lead is essentially irreparable. The most common source of lead poisoning in Michigan is lead-based paint in aged housing.

In Michigan as many as 20,000 children under age six may have lead poisoning. If not detected early, lead that accumulates in a child's body may cause brain damage, mental retardation, learning difficulties, behavior problems, anemia, liver and kidney damage, hearing loss, developmental delay, hyperactivity, and, in extreme cases, coma and death.

How is Michigan doing?

In Michigan, 27% of the housing stock was built before 1950. In some areas of Michigan (Detroit city, Gogebic and Ontonagon counties), more than half of the housing was built before 1950. Industrial usage of lead (smelters, metal work, etc.) and lead deposited in the environment from leaded gasoline persists, resulting in numerous exposure opportunities. Michigan ranks as the sixth state in the nation with environmental lead sources according to Centers for Disease Control and Prevention (CDC) estimates.

Since 1997, all blood lead analyses performed on any Michigan resident must be reported by the analyzing laboratory to the statewide surveillance system housed in the Childhood Lead Poisoning Prevention Program. This data system is used to analyze testing rates and numbers of children with lead poisoning statewide on an annual basis and compares Michigan findings with those of other states. Despite efforts throughout the years, the percentage of children under age six who need to be tested having had *at least* one blood lead test has never been more than 11%.

How does Michigan compare with the U.S.?

While testing only a limited sample of Michigan children under age six, the prevalence of elevated blood lead levels ($\geq$10ug/dL) is higher than the U.S. average. Testing rates for children on Medicaid are between 18-25%, similar to those rates in most other states. In 2002, 4.4% of children under age six in Michigan were identified as lead poisoned, nearly double the U.S. rate. In Michigan, there are neighborhoods where as many as 25-30% of children tested have blood lead levels above the threshold of concern ($\geq$10ug/dL).

Figure 36: Blood Lead Testing Children Under Age Six, 1994-2002

	1994	1995	1996	1997	1998	1999	2000	2001	2002
# of Children Tested	57,621	43,150	48,367	50,021	73,643	79,063	78,040	87,875	92,767
# Confirmed >=10ug/dL	0	4,105	3,291	4,709	7,144	5,712	4,243	4,771	4,083
# Confirmed >=15ug/dL	2,691	1,654	1,202	1,603	2,775	2,201	1,523	1,647	1,505
% Confirmed >=10		9.5%	6.8%	9.4%	9.7%	7.2%	5.4%	5.5%	4.4%
% Confirmed >=15	4.7%	3.8%	2.5%	3.2%	3.8%	2.8%	2.0%	1.9%	1.6%
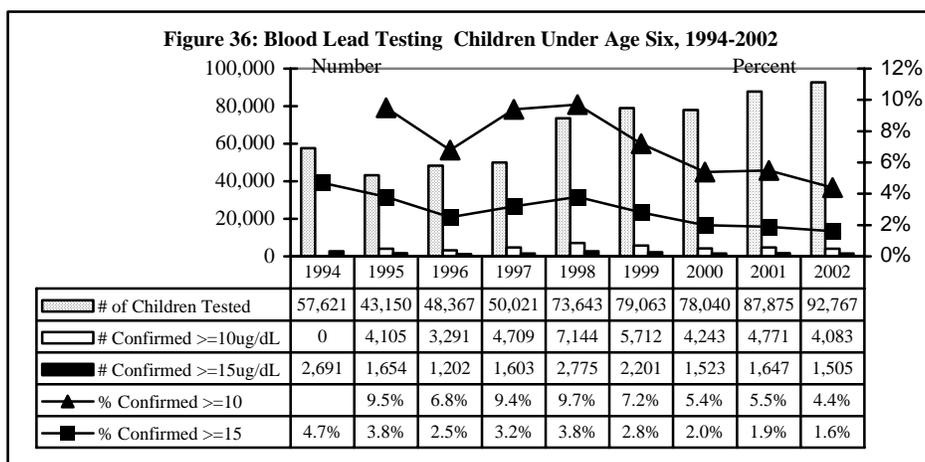
Healthy People 2010 goals:

8-11.   Eliminate elevated blood lead levels in children.

Target: Zero Percent.

U.S. Baseline: 4.4 percent of children aged 1 to 6 years had blood lead levels exceeding 10 µg/dl during 1991–94.

Target setting method: Total elimination.

U.S. Data Source: National Health and Nutrition Examination Survey (NHANES), CDC, NCHS.

How are different populations affected?

Lead poisoning may impact vision, hearing, growth, educability, employability, and socialization skills. Symptoms may be absent or include stomach complaints, behavior change (including aggression and delinquency), and may cause coma or even death. A child may also be poisoned before birth if the mother has had prenatal lead exposure, even back to her childhood.

Another source of exposure to lead is "take-home lead", which is lead dust on an adult's clothing, shoes, body, etc. that is carried home from their place of work or hobby. If the adult comes in contact with a young child before changing clothes and shoes or bathing, the lead may be transferred to the child and contribute to lead poisoning.

Michigan children with elevated blood lead levels have been found mostly in urban areas: Detroit, Flint, Saginaw, Pontiac, Grand Rapids, Muskegon, and Benton Harbor. They are disproportionately children of color living in poverty in decaying urban environments. Poisoned children are prone to discipline and behavioral problems, school failure, incarceration, unemployability, and criminal justice experiences. However, lead poisoning is not entirely a problem of children in low-income families. Families remodeling old homes can seriously expose their children to lead hazards while dry-scraping paint, replacing windows or removing walls.

What other information is important to know?

One hundred percent of children on Medicaid should be tested at ages one <u>and</u> two years. Michigan and the U.S. still have much work to do to reach the required level of testing. Michigan's Governor has drawn attention to the problem of childhood lead poisoning by

convening a statewide, multi-agency, multidisciplinary task force to identify recommendations for action regarding this complex environmental issue. Targets have been set for the years up to 2006 that would result in lowering the rate of children in Michigan who become lead poisoned, so that Michigan can reach the 2010 goal of eliminating childhood lead poisoning.

Overview of Access to Care for Adolescents

Adolescents have the lowest utilization of healthcare services of any age group and are the least likely to seek care at a provider's office. Nationally, about 3.1 million adolescents or approximately 13% of those ages 10-18 have no health insurance.

An estimated one in five adolescents suffer from at least one serious health problem, and at least one in four are believed to be at high risk for school failure, delinquency, early-unprotected sexual intercourse, or substance abuse. Between five and ten percent have a chronic disease or disability, such as asthma, **type II diabetes**, heart disease, vision impairment, etc. Prevention and primary care services are particularly critical for this population given that the most serious, costly and widespread adolescent health problems (unintended pregnancies, sexually transmitted infections, unintended injury, and substance abuse) are preventable. Through education, screening, **anticipatory guidance**, counseling, early intervention and treatment, preventive care can help to establish healthy habits that last a lifetime. Immunizations, chlamydia screening, teen pregnancy prevention programs and tobacco cessation programs have been cost-effective.

The *Feasibility Study Project* states the top three barriers to children getting necessary medical care outside of a school based/linked health center (SBLHC) are: transportation, parent involvement, and accessible services. SBLHCs are uniquely situated to address each of these barriers.

How is Michigan doing?

School-based/linked health centers have been funded since 1987 providing on-site primary healthcare, psychosocial and referral services, and health promotion/disease prevention education, in 22 **medically underserved** communities in Michigan. From 1987-2000, the number of youth accessing SBLHCs for primary care services increased each year. Starting in 2001, the number of youth accessing these centers declined due to funding cuts to the program. Six months later, in June 2002, funding was restored to the program and youth access again increased. There is now a renewed focus on outreach to medically underserved youth.

How does Michigan compare with the U.S.?

Currently, there is no data on access to care for adolescents in Michigan. It is assumed that Michigan mirrors national data showing adolescents having the lowest utilization of healthcare services of any age group and being the least likely to seek care at a provider's office.

Healthy People 2010 goals:

1-4. Increase the proportion of persons who have a specific source of ongoing care.			
Target and U.S. Baseline:			
Objective	**Increase in Persons With Specific Source of Ongoing Care**	**1998 Baseline**	**2010 Target**
		Percent	
1-4a.	All ages	87	96
1-4b.	Children and youth aged 17 years and under	93	97

Target setting method: Better than the best.

U.S. Data Source: National Health Interview Survey (NHIS), CDC, NCHS.

How are different populations affected?

Funded SBLHCs are all located in **medically underserved areas**. They are in areas that have high unemployment rates, higher than average numbers of children living in poverty, and higher than average numbers of single parent families (fragmented family structure). Around 60% of youth that access these clinics have Medicaid, although it ranges from 10% to 90%, and 63% of services were provided to youth of color in calendar year 2002. SBLHCs are often the only source of healthcare that is accessible to this population, particularly in more rural areas.

What other information is important to know?

There are efforts underway to establish school-based/linked health centers (resource centers) in failing schools. Additionally, the City of Detroit is undertaking a major initiative that has called for a school-based health center in every public school in Detroit. There is unilateral support in Michigan for school-based/linked health centers.

Additional Resources:
- National Center for Health Statistics, 1997.
- National Center for Health Statistics, 1998.
- Michigan Department of Community Health

Overview of Teenage Pregnancy

The impact of teen pregnancy is significant for teen parents, their children, communities and all of Michigan. Less than one-third of teens that become parents before the age of 18 ever complete high school. They are more likely to experience social and economic disadvantage, which may last throughout their lives.

Children of teen parents face significant disadvantages throughout their lives. They have an increased risk of pre-term delivery, fetal distress and other negative birth outcomes. They are more likely to struggle in school, both academically and behaviorally. They are more likely to grow up in single parent households, spend time in the justice system, and become teen parents themselves, thereby continuing the cycle of social and economic disadvantage.

How is Michigan doing?

The rates of teen pregnancy and births in Michigan have steadily decreased since 1990. The overall pregnancy rate for 15-17 year olds has dropped by 43% to the rate of 35.2/1,000 in 2001 while the **birth rate** stood at 21.3/1,000 (dropping from 23.1 in 2000). A total of 4,263 babies were born to teens 15-17 years old during 2001, whereas 4,607 babies were born to the same age group in 2000. While rates have dropped, they still remain unacceptably high.

How does Michigan compare with the U.S.?

The National Campaign to Prevent Teen Pregnancy conducts state-by-state comparisons on teen pregnancy and birth rates. From 1992-1996, Michigan ranked 10th from the top in the nation in **teen pregnancy rate** reduction. The rate for teen pregnancies in the 15-19 year old age group dropped 19% during that time, whereas the national rate dropped 13%. In 1996, Michigan ranked 23rd in the nation for teen pregnancy rates at 76.7/1,000, while the national average was 97/1,000.

Michigan ranked 18th in the nation on **teen birth rates** in 2001 (38.0/1,000 females ages 15-19). The national rate for teen births in 2001 was 46.0/1,000 females ages 15-19. The Kaiser Family Foundation ranked Michigan as 6th in the nation for percent change in teen birth rate between 1991 and 2001, declining 35%. Nationally, the reduction in teen birth rates was 27%.

Healthy People 2010 goals:

9-7.   **Reduce the rate of pregnancy among adolescent females.**
Target: 43 pregnancies per 1,000 females age 15-17.
U.S. Baseline: 68 pregnancies per 1,000 females aged 15 to 17 years occurred in 1996.
Target setting method: Better than the best.
U.S. Data Source: Abortion Provider Survey, The Alan Guttmacher Institute; National Vital Statistics System CDC, NCHS; National Survey of Family Growth, CDC, NCHS; Abortion Surveillance Data, CDC, NCCDPHP.

How are different populations affected?

The data clearly indicates a disparity in teen birth rates between whites and blacks in Michigan. The birth rate for blacks 10-14 years old was 2.4/1,000 in 2001, up from 2.1/1,000 in 2000. In comparison, the rate for whites of the same age was 0.3/1,000 for both years. This translates into a rate for black teens in this age group that is eight times higher than that for white teens. For

black teens age 15-17, the birth rate was 50.0/1,000 in 2001 and 15.1/1,000 for white teens. Black teens in this age group are three times more likely to give birth than their white counterparts. At the 18-19 year age group the birth rate was 121.1/1,000 in 2001 for blacks and 57.5/1,000 for whites. This represents a rate two times higher for blacks compared to whites ages 18-19 years old.

Risk factors for teen pregnancy are many and varied. Disadvantaged communities with high poverty, crime, and unemployment rates have higher rates of teen pregnancy and birth. These communities also tend to have lower educational levels amongst adult residents. This can lead to a lack of educational inspiration for youth and a subsequent lack of future direction, which increases the risk of teen pregnancy. Communities lacking opportunities for youth create environments that support risk-taking behavior in many forms, including sexual risk-taking. These communities tend to have higher rates of substance use and delinquent behaviors amongst teens. Teens living in communities where their peers are sexually active and are already parents come to socially accept this, creating heightened risk for themselves. When determining where to place teen pregnancy prevention programs, the risk factors point to Michigan's black communities, targeting those that are the most disadvantaged.

What other information is important to know?
The Michigan Family Planning Program makes available general reproductive health assessment, comprehensive contraceptive services, related health education and counseling and referrals as needed to every citizen of the state. One-third of the population served are teens 19 years and under. The Michigan Abstinence Program (MAP) funds 12 local coalitions to provide abstinence education for youth ages 9-17, parent education, coalition development and maintenance activities and community awareness activities. The Michigan Teen Outreach Program (MTOP) funds four communities to provide service learning/youth development and abstinence education programming for teens age 12-18 years, along with parent education activities. The adolescent health center program provides on-site primary healthcare, psychosocial services, health promotion/disease prevention education and referral services through **school-based/linked health centers. Non-clinical centers** focus on case finding, screening, and referral for primary care and health education services. No primary care services are provided at non-clinical centers.

Maternal Mortality and Morbidity

Overview of Maternal Mortality and Maternal Morbidity

The death of a woman while pregnant or within a year of the end of the pregnancy due to complications of the pregnancy is a rare occurrence that reflects the physical, social and mental well-being of women of childbearing age and access to healthcare. A steep decline in maternal **mortality** began in 1930, continued until 1960 and then slowed. Since the early 1980s, the maternal mortality ratio has remained constant. The Centers for Disease Control and Prevention (CDC) estimates that half the deaths resulting from pregnancy complications could be prevented by better access to quality healthcare and changes in health behaviors and lifestyle.

Maternal **morbidity** is more common. Maternal complications may range from easily treatable to life threatening, such as **amniotic fluid embolism, hemorrhage, preeclampsia** and **eclampsia** or a prior medical condition complicating the delivery such as chronic hypertension, cardiac disease, sickle cell disease, and asthma.

How is Michigan doing?

The pregnancy-related mortality ratio, as reported on death certificates, was 7.1 deaths per 100,000 live births between 1990-1999. The ratio in 2000-2001 was 6.7. Because of the range of conditions and timing of pregnancy-related morbidity, data to estimate all maternal morbidity are not available in the U.S. or Michigan. However, 98% of births occur in a hospital, and the number of deliveries with an associated complication is available from the Michigan Inpatient Data Base. Analysis of 2000 and 2001 discharge data found that approximately 29% of hospitalizations for labor and delivery had a least one associated complication.

How does Michigan compare with the U.S.?

Michigan has one of the largest disparities in the nation in maternal deaths between black and white populations. The black maternal mortality ratio has been over six times that of white women in Michigan compared to 3-4 times nationally.

From 1991-1999, the pregnancy-related mortality ratio was 11.8 deaths, 9.8 in 2000, and 9.9 in 2001 per 100,000 live births. Estimates between 1993 and 1997 show 43% of women in the U.S. had a severe complication during hospitalization for labor and delivery.

Healthy People 2010 goals:

16-4.   Reduce maternal deaths.

Target: 3.3 maternal deaths per 100,000 live births.

U.S. Baseline: 7.1 maternal deaths per 100,000 live births occurred in 1998.

Target setting method: Better than the best.

U.S. Data Source: National Vital Statistics System (NVSS), CDC, NCHS.

16-5. Reduction in maternal illness and complications due to pregnancy.			

Target and U.S. Baseline:

Objective	Reduction in maternal illness and complications.	1998 Baseline	2010 Target
		Per 100 deliveries	
16-5a.	Maternal complications during hospitalization, labor and delivery	31.2	24

Target setting method: Better than the best.

U.S. Data Source: National Hospital Discharge Survey, CDC, NCHS.

How are different populations affected?

Black women in Michigan have higher maternal mortality rates than other racial and ethnic groups. From 1990-1999, the pregnancy-related ratio for black women was 20.4. The ratio decreased during the 1990s and was 12.6 in 1999, 16.6 in 2000 and 17.0 in 2001. These ratios are based on extremely small numbers of deaths (1999, 3; 2000 and 2001, 4 deaths each year) and yearly estimates are unreliable. Black women were 1.3 times more likely to have a serious complication during hospitalization for labor and delivery in 2000-2001. Women 35 years old and older accounted for almost 13% of births in 2000 and 2001; however, they experienced almost 15% of all labor and delivery complications. Black and white women 35 years old and older experienced the highest percent of complications, 47% and 30% respectively.

What other information is important to know?

The usual source for identifying maternal deaths is the vital records system. However, each year the Michigan Maternal Mortality Study, utilizing enhanced case findings and chart review, has identified almost twice as many pregnancy-related deaths. This study, initiated in 1950, has provided information for the improvement of maternal care.

The CDC is currently developing definitions to better define maternal morbidity and identifying data sources such as computerized clinical data collected by large managed care organizations to identify conditions which occur in all settings – emergency room, outpatient and inpatient.

Additional Resources:
- Centers for Disease Control. Maternal Mortality. (1998). United States, 1982-1996. *Morbidity and Mortality* Weekly Review. Surveillance Summary, 47(34): 705-707.
- Centers for Disease Control and Prevention. (2003). Safe Motherhood: Promoting Health for Women Before, During, and After Pregnancy, At A Glance. wysiwyg://48/http://www.cdc.gov/cccdphp/aag/aag_drh.htm.
- Centers for Disease Control and Prevention. (2003). Pregnancy-Related Mortality Surveillance - United States, 1991-1999, 52(SS-2).
- Vital Records & Health Data Development Section, Michigan Department of Community Health. www.michigan.gov/mdch.
- National Center for Health Statistics. (2003). National Vital Statistics Reports, 41(4).
- Danel I, Berg C, Johnson CH, Atrash H. (2003). Magnitude of Maternal Morbidity During Labor and Delivery: United States, 1993-1997. American Journal of Public Health, 93:631-634.
- Berg CJ, Bruce FC, Callaghan WM. (2002). From Mortality to Morbidity: The Challenge of the Twenty-First Century. Journal of the American Medical Women's Association, 57:173-174.

Overview of Immunizations

Michigan is working to increase childhood immunizations. The federal Vaccines for Children (VFC) and the MI-VFC programs make vaccines available to children from low-income families. This eliminates the major financial barrier to children being vaccinated. In 2002, over two million doses of vaccine were distributed. All recommended vaccines are available for eligible children. Incentives are provided for Medicaid managed care plans that have children appropriately immunized.

The Michigan Childhood Immunization Registry (MCIR) is a statewide registry of immunizations administered to children (infants - 20 years of age) that can be accessed by approved users anywhere in the state to reduce missed opportunities to vaccinate children. MCIR also generates recall cards for children who have fallen behind on their immunizations. Providers and local health departments can generate profiles of the immunization levels in their clinic or community to determine if additional interventions should be developed. MCIR contains over 32 million shot records on more than 2.8 million children.

A fully operational population-based registry includes capabilities to (1) protect confidential information, (2) enroll all children at the State or community-level automatically at birth, (3) give providers access to complete vaccination history, (4) recommend needed vaccinations, (5) notify children who are due and overdue for vaccinations, (6) assess practice and geographic-level coverage, and (7) produce authorized immunization records. The Michigan Childhood Immunization Registry (MCIR) possesses all of these capabilities and more. The MCIR is a very comprehensive registry, which is well accepted by immunization providers across the state.

Parents need accurate information about vaccines in order to make informed decisions about their children's health. Federal law mandates that Vaccine Information Statements be given to the parent(s) to read prior to any immunization of their children. The department provides pamphlets on immunization and specific vaccines. Information on new vaccines, vaccine schedules, appropriate storage, and handling of vaccines is available to providers through newsletters, seminars, conferences, and videoconferences. Numerous Assessment, Feedback, Incentive, and eXchange (AFIX) visits to local health departments and immunization providers are also conducted. These provide direct feedback about ways to increase immunization levels in their offices. Immunization field representatives work with local health departments to encourage immunizations as part of maternal and child health services. Testing services are provided for the diagnosis of many vaccine-preventable diseases to assess vaccine failure and disease control in unvaccinated populations.

Immunization and Vaccine Preventable Diseases

Vaccines can prevent the debilitating and, in some cases, fatal effects of infectious diseases. Vaccines help to eliminate the illness and disability of polio, measles, and rubella. The organisms that cause these diseases have not disappeared. Rather, they have receded and will reemerge if the vaccination coverage drops. The health burden of vaccine preventable diseases (VPDs) is evident from the measles resurgence of 1989 to 1991, resulting in more than 55,000 cases, 11,000 hospitalizations, 120 deaths, and $100 million in direct medical care costs.

Vaccines protect society as well as the vaccinated individual. When vaccination levels in a community are high, the few who cannot be vaccinated - such as young children and persons

with **contraindications** to vaccination - often are indirectly protected because of group immunity (i.e., they live among vaccinated persons who may offer protection from exposure to disease).

Three childhood vaccines (**diphtheria, tetanus toxoids, and acellular pertussis vaccine (DTaP**); **measles, mumps, and rubella vaccine (MMR**); and *Haemophilus influenzae* **type b (Hib**) vaccine) result in substantial direct medical savings for each dollar spent to vaccinate children against these diseases. **Varicella** vaccine saves roughly 90 cents in direct medical costs for every dollar invested. Consideration of indirect savings—prevention of work loss by parents to care for ill children and prevention of death and/or lost earnings from disability—shows that vaccines routinely recommended for children are very cost-effective. Savings range from $2 for the more recently approved Hib vaccine to $24 dollar spent on DTaP.

The Institute of Medicine recommends that states create and support population-based immunization registries. Such registries provide all physicians with quick access to immunization records, allowing them to follow up with children who are behind in their immunizations. These registries can consolidate records from all providers and will help achieve Michigan's immunization coverage goals.

Significant progress has been made in reducing indigenous (not imported) cases of VPDs. The occurrence of many VPDs is at or near record-low levels. Most diseases have been reduced by more than 95% from peak pre-vaccine levels. In Michigan we, like the rest of the country, have had tremendous success at reducing VPDs to near zero (see Table 18).

Table 18: Total number Cases and Cases to children < 5 years old in 2001		
Disease	Total Cases 2001	Cases to children < 5 years old 2001
Congenital Rubella	0	0
Diphtheria	1	0
H. influenzae invasive	14	1
Hepatitis B	618	6
Measles	0	0
Mumps	5	1
Pertussis	149	69
Poliomyelitis	0	0
Rubella	0	0
Tetanus	0	0

Based on the latest National Immunization Survey (NIS), a random telephone survey done by CDC on an annual basis, Michigan moved from a 70.0% immunization level in 2001 to 81.6% for 2002 for 4 doses of DTaP, 3 doses of **polio**, 1 dose of MMR, 3 doses of Hib, and 3 doses of hepatitis B vaccines (4:3:1:3:3 series), for children age 19-35 months. The *Healthy People 2010* goal for the 4:3:1:3:3 series is 80%.
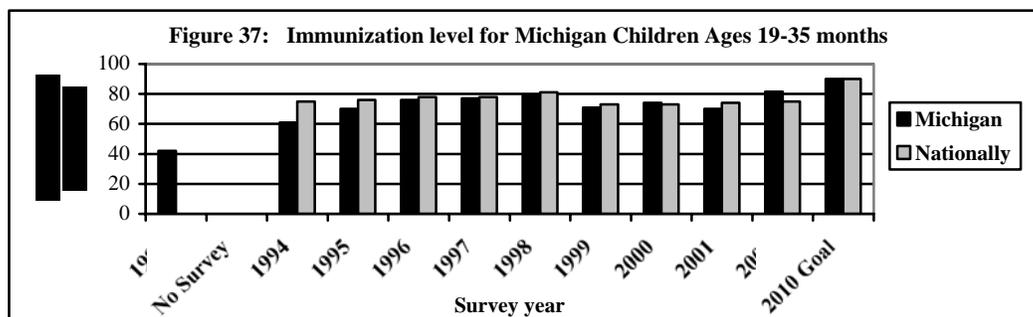
Figure 37: Immunization level for Michigan Children Ages 19-35 months

Michigan has made substantial progress in meeting the Healthy People 2010 goal of obtaining a 90% vaccination level for each of the routinely recommended vaccines by series. Based on NIS 2002 data, the following levels were obtained: 4 doses of **DTaP** 87.4%, 3 doses of polio 92.9%, 1 dose of MMR 93.3%, 3 doses of Hib 96.6%, 3 doses of hepatitis B 93.1%, and 1 dose of varicella (chickenpox) 83.0%. Michigan will need to improve the coverage levels for the DTaP and varicella series.

Figure 38: Immunization levels for Michigan Children Ages 19-35 months
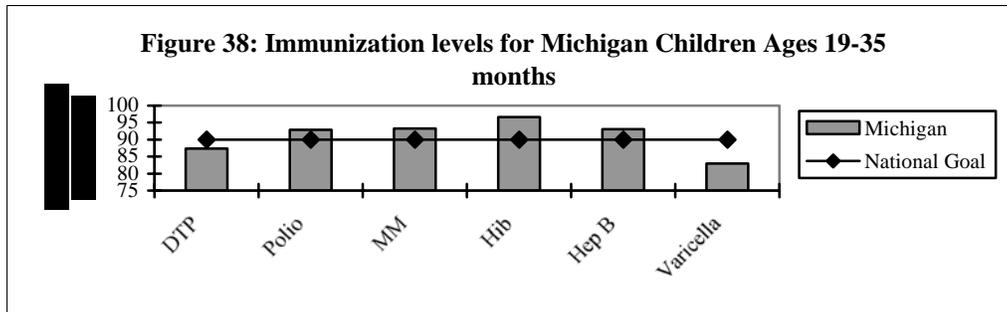
Michigan was ranked 42nd in 2001 (3.7% lower than the national average of 73.7%) for 4 doses of DTaP, 3 doses of polio, 1 dose of MMR, 3 doses of Hib, and 3 doses of hepatitis B vaccines (4:3:1:3:3 series), for children age 19-35 months. In 2002, Michigan was ranked as having the sixth highest immunization level in the country at 81.6%, which is 6.8% over the national average for the same 4:3:1:3:3 series. In 1994, the Centers for Disease Control and Prevention ranked Michigan last in the nation with an immunization rate of 61%. Tremendous progress has been made in Michigan so that all its citizens are protected from vaccine preventable diseases.

According to the NIS for 2002, the national average for 4 doses of DTaP vaccine is 81.6% and therefore Michigan's 87.4% is 6% higher than the national average. Similarly, Michigan's rate for varicella is 83.0%, which is 2.4% higher than the 80.6% rate.

Michigan has made great progress at reducing and, in some cases, eliminating vaccine preventable diseases. In fact, the numbers are so small it is difficult to make comparisons at the national level. One that Michigan can make progress in is in reducing the number of pertussis cases. The national **morbidity** rate for pertussis in 2002 was approximately 2.95/100,000 and the rate for Michigan was 0.6/100,000. Michigan has a fairly large Amish population who many times do not accept immunizations. A number of pertussis cases occur in the Amish communities. Thus far in 2003, Michigan reported two cases of measles. These were the first cases of measles reported in the state since 2000, when three cases were reported. Indigenous spread of measles has been virtually eliminated and the only cases now reported are imported.

On the basis of 2001 U.S. census estimates, approximately 44% of U.S. children aged <6 years had two or more vaccinations recorded in an immunization registry nationwide. This can be compared to Michigan where 84% of the children aged 0-6 years have two or more shots in the MCIR. Great progress has been made to recruit and train new providers on the use of the MCIR. In January of 2003, a new version of the MCIR was released which allows users to access the MCIR via the Internet, making it more accessible to all immunization providers.

Healthy People 2010 goals:

14-1. **Reduce or eliminate indigenous cases of vaccine-preventable diseases.**

Target and U.S. Baseline:

Objective	Reduction in Vaccine Preventable Diseases	1998 Baseline	2010 Target
		Number of Cases	
14-1a.	Congenital rubella syndrome (children under age 1 year)	7	0
14-1b.	Diphtheria (persons under age 35 years)	1	0
14-1c.	*Haemophilus influenzae* type b[*] (children under age 5 years)	163	0
14-1d.	Hepatitis B* (persons aged 2 to 18 years)	945**	9
14-1e.	Measles (persons of all ages)	74	0
14-1f.	Mumps (persons of all ages)	666	0
14-1g.	Pertussis (children under age 7 years)	3,417	2000
14-1h.	Polio (wild-type virus) (persons of all ages)	0	0
14-1i.	Rubella (persons of all ages)	364	0
14-1j.	Tetanus (persons under age 35 years)	14	0
14-1k.	Varicella (chicken pox) (persons under age 18 years)	4 million***	400,000

*Includes cases with type b and unknown serotype. - **Estimated hepatitis B cases for 1997.[26]
***Data based on average from 1990–94 for persons of all ages.

Target setting method: Total elimination for congenital rubella syndrome, diphtheria, *Haemophilus influenzae* type b, measles, mumps, polio, rubella, and tetanus; 41 percent improvement for pertussis; 99 percent improvement for hepatitis B; and 99 percent improvement for varicella.

U.S. Data Source: National Notifiable Disease Surveillance System, CDC, EPO; National Congenital Rubella Syndrome Registry, NIP congenital rubella syndrome; Active Bacterial Core Surveillance, Emerging Infections Programs, NCID *Haemophilus influenzae* type b; National Health Interview Survey, NCHS varicella.

14-22. **Achieve and maintain effective vaccination coverage levels for universally recommended vaccines among young children.**

Target and U.S. Baseline:

Objective	Increase in and maintenance of vaccination coverage levels among children aged 19 to 35 months	1998 Baseline	2010 Target
		Percent	
14-22a.	4 doses diphtheria-tetanus-acellular pertussis (DTaP) vaccine	81	90
14-22b.	3 doses *Haemophilus influenzae* type b (Hib) vaccine	93	90
14-22c.	3 doses hepatitis B (hep B) vaccine	97	90
14-22d.	1 dose measles-mumps-rubella (MMR) vaccine	92	90
14-22e.	3 doses polio vaccine	91	90
14-22f.	1 dose varicella vaccine	43	90

Target setting method: Consistent with the Childhood Immunization Initiative

U.S. Data Source: National Immunization Survey (NIS), CDC, NCHS and NIP.

14-24.	Increase the proportion of young children and adolescents who receive all vaccines that have been recommended for universal administration for at least 5 years.		

Target and U.S. Baseline:

Objective	Increase in Coverage Levels of Universally Recommended Vaccines	1998 Baseline	2010 Target
		Percent	
14-24a.	Children aged 19 to 35 months who receive the recommended vaccines (4DTaP, 3 polio, 1 MMR, 3 Hib, 3 hep B)	73	80

Target setting method: Better than the best.

U.S. Data Source: National Immunization Survey, CDC, NCHS and NIP; National Health Interview Survey.

14-26.	Increase the proportion of children who participate in fully operational population-based immunization registries.

Target: 95 percent of children under age 6 years

U.S. Baseline: 32 percent of children under age 6 years participated in an immunization registry in 1999.

Target setting method: 197 percent improvement. (Better than the best will be used when data are available.)

U.S. Data Source: Immunization Program Annual Reports, CDC, NIP.

How are different populations affected?

NIS data routinely shows that there are lower immunization rates for children aged 19-35 months living in the city of Detroit. Detroit children have rates that are 19% lower than the rest of the state for 4:3:1:3:3 coverage (4 DTaP, 3 Polio, 1 MMR, 3 Hib and 3 **Hep B**). In children living at or above the poverty level, there is a gap of 19% between Detroit and the remainder of the state. Comparing rates of children living in Detroit to those of any child living in a metropolitan area within the state, the difference drops to about 12%. Statewide, children living in a non-metropolitan area have a 4:3:1:3:3 coverage rate of 83.8%, while those living in a central metropolitan city (including Detroit) are at 76.7% and children living in a non-central metropolitan are, at 83.2%. Differences in immunization rates clearly exist for children living in metropolitan areas, with marked differences for children residing in Detroit.

National data shows that children aged 19-35 months living at or below the poverty level have a 4:3:1:3:3 immunization coverage rate of 69.3%, compared to a national rate of 74.8%. The NIS reports that 17.2% of Michigan children aged 19-35 months are living below poverty level, while 39.6% of Detroit children are below poverty level. Immunization levels for Michigan children based on poverty levels are not available, but they most likely mirror the national trends of children living below the poverty level having lower immunization rates.

What other information is important to know?

The mission of the Michigan Immunization Program is to "*minimize and prevent the occurrence of vaccine preventable diseases within our state.*" The program fulfills its mission through:

- Promoting high immunization levels for children and adults
- Providing vaccines through a network of public/private healthcare providers
- Facilitating the development, use and maintenance of immunization information systems
- Supporting disease surveillance and outbreak control activities
- Providing educational and technical consultation for public and private healthcare providers

- Promoting the development of private/public partnerships to improve immunization levels
- Promoting provider and consumer awareness of immunization issues

These goals are accomplished through very well established working relationships between the Michigan Department of Community Health and all the local health departments and private practitioners around the state who administer vaccines. It is through these partnerships and many dedicated staff that we can accomplish these goals.

<center>**_Injury_**</center>

Overview of Injury

Injuries are one of the most under-recognized public health problems facing society today. "Unintentional injuries" are injuries that the have historically been referred to as accidents. These include injuries due to car crashes, fires, falls, drowning, poisoning, suffocation, bicycle crashes, being cut by sharp objects, etc. The word "accident" implies that the event could not have been prevented. Public health professionals use the term "unintentional injuries" (hereafter "injuries").

The following indicators will be used to measure progress within the injury area: injury deaths, motor vehicle injury deaths, fall injury deaths, and poisoning deaths. These indicators have been selected because they have been identified as priority causes of injury in the **Michigan Injury Prevention Plan.**

How is Michigan doing?

Injuries**:** In 2001, injuries were the fifth leading cause of death for all ages combined and the leading cause of death for people ages 1-34 years in Michigan. The average annual number of injury deaths to Michigan residents between 1999 and 2001 was 3,214. This corresponds to an average annual death rate of 32.3 deaths per 100,000 Michigan residents. Injuries were the second leading cause of **Years of Potential Life Lost (YPLL)** for people under age 75, thus indicating that a high proportion of the deaths are to younger people.

Between 1990 and 2001, there was no specific trend in injury death rates, ranging from a low of 28.8/100,000 in 1993 to a high of 32.7 in 2000. A portion of the increase in numbers and rates of death for 1999-2001 is attributed to changing **mortality** coding from ICD-9 to ICD-10.

Motor Vehicle Crashes**:** A "traffic crash" is defined as an incident that occurs on a public traffic way. A "motor vehicle" includes a car, pick-up truck, van, heavy transport vehicle, bus, motorcycle, or off-road motorized vehicle. Motor vehicle crashes were the leading cause of traumatic death in Michigan. This category is primarily comprised of occupants of motor vehicles, motorcyclists, pedal cyclists, and pedestrians. An average of 1,342 Michigan residents died annually between 1999 and 2001 due to motor vehicle crashes with an annual death rate of 13.5. Michigan's motor vehicle injury death rate decreased 27% between 1990 and 2001.

Falls**:** Fall injuries are the second leading cause of injury-related death in Michigan. An average of 437 Michigan residents died annually between 1999 and 2001 as a result of unintentional falls with a death rate of 4.4/100,000 residents. Between 1990 and 2001, the fall death rates ranged from a low of 2.5 in 1993 to a high of 5.1 in 2001. The state has recently had a dramatic increase in fatal falls: from 1998 to 2001, with the rate increasing by 55%.

Poisoning: The third leading cause of injury-related death in Michigan is unintentional poisonings. From 1999 to 2001, an average of 317 residents of Michigan died annually from unintentional poisonings for an average annual death rate of 3.2. From 1990 to 2001, death rates ranged from 1.1 (1992) to 3.4 (2001). Poisoning death rates nearly tripled between 1990 and 2001.

How does Michigan compare with the U.S.?

Figure 39: Death Rate Due to Unintentional Injury by year, Michigan vs. United States 1990-2000
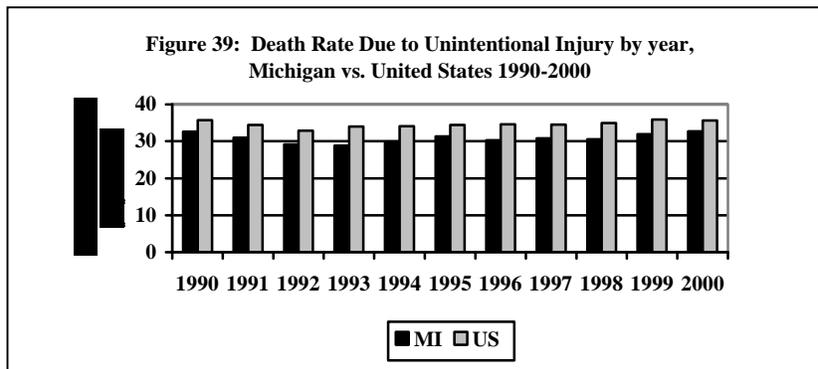
Source: Vital Records and Health Data Development Section, MDCH
Web-based Injury Statistics Query and Reporting System, CDC and US Census Data

In 2000, Michigan's injury death rate was lower (32.7) than the national rate (35.6). During the 12-year period from 1990-2001, injury death rates for Michigan residents were consistently lower than national rates by about four deaths per 100,000.

Michigan's motor vehicle injury death rate was 14.3 compared to a national rate of 15.3 in 2000. From 1990-2001, Michigan's motor vehicle injury death rate mirrored national trends and was generally less than the national rate by about 1 death per 100,000.

The fall injury death rate in Michigan during the year 2000 was 4.2 compared to 4.8 nationally. While Michigan's fall injury death rates increased during 1990-2001, they were consistently lower than national rates. The state has seen a 55% increase in fatal falls from 1998 to 2001, while national rates have remained relatively stable.

In 2000, Michigan's poisoning death rate was 3.3 compared to 4.6 nationally. From 1990-2001, Michigan's poisoning death rates were consistently lower than national rates by approximately 1.7 deaths/100,000, but in Michigan and nationally, poisoning death rates have increased dramatically, nearly tripling in Michigan and doubling in the U.S. during the same time period.

Healthy People 2010 goals:

15-8.   Reduce deaths caused by poisonings.

Target: 1.5 deaths per 100,000 population.

U.S. Baseline: 6.8 deaths per 100,000 population caused by poisonings in 1998 (age-adjusted to year 2000 standard population).

Target setting method: Better than the best.

U.S. Data Source: National Vital Statistics System (NVSS), CDC, NCHS.

15-13.   Reduce deaths caused by unintentional injuries.

Target: 17.5 deaths per 100,000 population.

U.S. Baseline: 35.0 deaths per 100,000 population caused by unintentional injuries in 1998. (age-adjusted to year 2000 standard population).

Target setting method: Better than the best.

U.S. Data Source: National Vital Statistics System (NVSS), CDC, NCHS.

15-15.   Reduce deaths caused by motor vehicle crashes.

Target and U.S. Baseline:

Objective	Reduction in Deaths Caused by Motor Vehicle Crashes	1998 Baseline	2010 Target
15-15a.	Deaths per 100,000 population	15.6*	9.2
15-15b.	Deaths per 100 million vehicle miles traveled	1.6	.8

  *Age adjusted to the year 2000 standard population.

Target setting method: Better than the best for 15-15a.; 50 percent improvement for 15-15b. (Better than the best will be used when data are available).

U.S. Data Source: National Vital Statistics System, CDC, NCHS; Fatality Analysis Reporting System, DOT, NHTSA.

15-27.   Reduce deaths from falls.

Target: 3.0 deaths per 100,000 population.

U.S. Baseline: 4.7 deaths per 100,000 population were caused by falls in 1998 (age-adjusted to year 2000 standard population).

Target setting method: Better than the best.

U.S. Data Source: National Vital Statistics System (NVSS), CDC, NCHS.

How are different populations affected?

*Injuries***:** The death rate for ages 75 and older (139.7) was higher than those for any other age group. The lowest rates were for ages 5-14. The injury death rate for males (42.0) was 82% higher than that of females (23.1). Male death rates exceeded female rates in every age and race category. The death rate for blacks (36.5) slightly exceeded that of whites (33.2). The highest injury death rate among any age, race and sex group was white males 75 and older (175.0).

*Motor Vehicle Crashes***:** The death rate for males (18.0) was nearly double that of females (9.2). Rates were substantially below the statewide rate for those under age 15, but increased dramatically for those aged 15-24. Residents aged 75 and older had the highest rate (27.4), which was twice the statewide rate. Death rates for blacks and whites were not substantially different.

*Falls***:** The death rate for males (5.0) was 32% greater than that of females (3.8). Death rates increased with age with the most dramatic increase among those aged 75 and older. The rate for whites (4.9) was 88% greater than that of blacks (2.6). The difference between the races was especially substantial among women (white females: 4.4, black females: 1.7).

Poisoning: Death rates for males (4.5) were more than twice that of females (1.9). After age 14, rates increased with age peaking in the 35-44 year age group (7.0). Thereafter, rates decreased with age until the oldest age group, whereupon rates again increased. Rates for black residents (5.7) were nearly twice those of white residents (2.9). Of all age/sex/race groups, black males aged 45-54 had the highest unintentional poisoning death rate (27.9).

What other information is important to know?

Child safety seats reduced the risk of death in cars by about 70% for infants and about 55% for toddlers ages 1-4. For those age nine and older, seatbelts reduce injury risk by about 50%.

Restraint use among young children varies by driver restraint use. Three-quarters of children ages 1-4 who ride with an unrestrained driver are also unrestrained (NHTSA, 1997).

Hip fractures and other injuries that result from falls can severely limit the independence of older adults, with declines seen in the ability to carry out activities such as dressing, bathing, shopping or housekeeping. The emotional effects of falling often result in fear of falling, which in turn results in restricted recreational and social activities for older adults. Placement in a nursing home (an ultimate loss of independence) is often due to falls, with 40% of nursing home admissions attributed to falls. A recent **RAND study** prepared for the U.S. Department of Health and Human Services found that a multi-factorial fall risk assessment and management program can be an effective intervention for fall prevention.

The most common poison exposures for children were ingestion of household products such as cosmetics and personal care products, cleaning substances, pain relievers, foreign bodies, and plants. For adults, the most common poison exposures were pain relievers, sedatives, cleaning substances, antidepressants, and bites/stings.

For every dollar spent on poison control services in 1992, an estimated $7 was saved in medical care payments by reducing the number of medically treated poisonings. The savings per call to the poison center were $175.

Additional Resources:
- National Highway Traffic Safety Administration, U.S. Department of Transportation. Traffic Safety Facts 2000: Occupant Protection. Washington: NHTSA, 2001. April 1, 2002. www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/TSF2000/2000occfacts.pdf.
- Vital Records & Health Data Development Section, Michigan Department of Community Health. www.michigan.gov/mdch.
- National Highway Traffic Safety Administration, U.S. (August 1997). Department of Transportation. National occupant protection use survey–1996. Research Note. Washington, DC.
- Tinetti, M.E. (Jan. 2, 2003). Preventing Falls in Elderly Persons. New England Journal of Medicine. 348:42-49.
- American Geriatrics Society. (2001). Guidelines for the Prevention of Falls in Older Person. JAGS. 49:664-672.
- RAND Survey. (2003). Evidence Report and Evidence-Based Recommendations: Falls Prevention Interventions in the Medicare Population. Prepared for U.S. Dept. of Health and Human Services.
- Litovitz TL, Klein-Schwartz W, White S, Cobaugh D, Youniss J, Omslaer J, Drab A, and Benson B. (2001). Annual Report of the American Association of Poison Control Centers Toxic Exposures Surveillance System. American Journal of Emergency Medicine, 19(5): 337 – 396.
- Centers for Disease Control and Prevention. National Center for Injury Prevention and Control Poisoning Fact Sheet. www.cdc.gov/ncipc/factsheets/poisoning.htm.

<div align="center">

Violence

</div>

Overview of Violence

Violence covers a broad range of behaviors, including but not limited to homicide, child abuse, assault, sexual violence, and elder abuse. One definition of violence is, "the threatened or actual use of physical force or power against another person, against oneself, or against a group or community, that either results in or has a high likelihood of resulting in injury, death, or deprivation." It is a serious public health issue because it impacts the health and well-being of thousands of Michigan citizens.

How is Michigan doing?

Homicide: In 2001, there were 689 deaths due to homicide among Michigan residents. The homicide rate was 6.9/100,000 residents. Overall, homicide rates have declined 35% since 1992 [white males: -45%; white females: -18%; black males: -34%; and black females: -50%]. Black males' ten-year average homicide rate was at least five times higher than any of the other groups.

Figure 40: Homicide Rates by Race and Gender
Michigan Residents, 1992-2001
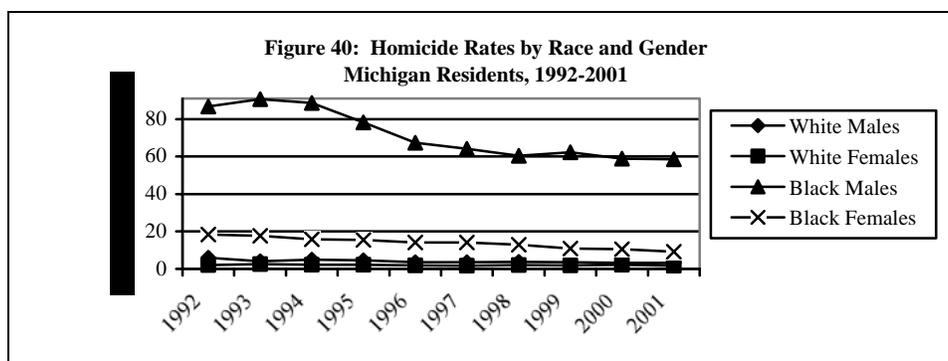
Although homicide was not among the top ten leading causes of death overall in the state in 2001, it was one of the top five causes of **mortality** for persons aged 1-34 years. It was also the sixth leading cause of **Years of Potential Life Lost (YPLL)** for people below the age of 75. This indicates that a substantial proportion of homicides involve younger people.

The majority of homicides are committed with firearms. In 2001, there were 499 homicide firearm deaths involving Michigan residents. The mortality rate was 5.0/100,000 residents. The mortality rate for homicide firearm deaths has been decreasing (-32% from 1992-2001).

However, firearms are involved in more than just homicides. In 2001, there were 1077 firearm deaths overall among Michigan residents. The firearm death rate was 10.8/100,000 residents. Although firearm death rates declined 25% in Michigan between 1992 and 2001, the 2001 Michigan **Behavioral Risk Factor Surveillance Survey (BRFSS)** indicated that approximately 38% of respondents kept firearms in the home.

Rape: There were 5,438 **rape** offenses reported to the Michigan State Police in 2002. However, it is estimated that only one of six rapes are reported. One study estimates that one in seven women in Michigan has experienced at least one forcible rape during their lifetime.

Physical Assault: Another underreported indicator of violence is physical assault. More than 36,000 **aggravated assaults** and over 125,000 **non-aggravated assaults** were reported to Michigan police in 2002. But perhaps the most underreported subset of physical assaults involves intimate partner violence. A representative survey (1996) regarding violence in

Michigan women found that almost one out of five women in the state with current partners sustained physical violence in that relationship.

Youth Violence: According to the 2001 Michigan **Youth Risk Behavior Survey (YRBS)**, 42% of 9th and 25% of 12th grade Michigan students had been involved in a physical fight during the previous 12 months. Compared to 1997, however, high school students were significantly less likely to carry a weapon on school property. The 2001 YRBS revealed that five percent of Michigan's high school students had carried a weapon at school during the past 30 days.

How does Michigan compare with the U.S.?

Homicide: Michigan's 2001 age-adjusted homicide rate of 6.9/100,000 residents was similar to the U.S. rate of 7.1. Also similar to Michigan, U.S. homicide rates have been declining (-25% from 1992-2001), including those involving firearms (-40%). Homicide was among the leading causes of death for persons aged 1-34 years in the U.S. in 2001 and the 6th leading cause of YPLL.

Rape: An estimate of the lifetime **prevalence** of rape among Michigan's adult women is 14.6% compared to an estimated U.S. rate of 13.4%. Also, a 1996 survey regarding violence against women found that Michigan women exceeded the nation for self-reported lifetime prevalence of physical (MI: 35%; U.S: 22%) and sexual violence (MI: 21%; U.S: 8%).

Youth Violence: The 2001 U.S. and Michigan YRBS reported similar results for students who reported being in a physical fight in the past 12 months (Michigan: 34%; U.S.: 33%). However, the percentage of Michigan high school students carrying a weapon to school during the month preceding the YRBS was slightly lower than the national prevalence (4.9% compared to 6.4%).

Healthy People 2010 goals:

15-3.   Reduce firearm-related deaths.

Target: 4.1 deaths per 100,000 population.

U.S. Baseline: 11.3 deaths per 100,000 population related to firearm injuries in 1998 (age-adjusted to year 2000 standard).

Target setting method: Better than the best.

U.S. Data Source: National Vital Statistics System (NVSS), CDC, NCHS.

15-32. Reduce homicides.

Target: 3.0 homicides per 100,000 population.

U.S. Baseline: 6.5 homicides per 100,000 population occurred in 1998 (age-adjusted to year 2000 standard).

Target setting method: Better than the best.

U.S. Data Source: National Vital Statistics System, CDC, NCHS; FBI Uniform Crime Reports, U.S. Dept of Justice.

15-34.   Reduce the rate of physical assault by current or former intimate partners.

Target: 3.3 physical assaults per 1,000 persons aged 12 years and older.

U.S. Baseline: 4.4 physical assaults per 1,000 persons aged 12 years and older by current/former intimate partners in 1998.

Target setting method: Better than the best.

U.S. Data Source: National Crime Victimization Survey (NCVS), U.S. Dept of Justice, Bureau of Justice Statistics.

15-35.   Reduce the annual rate of rape or attempted rape.

Target: 0.7 rapes or attempted rapes per 1,000 persons.

U.S. Baseline 0.8 rapes or attempted rapes per 1,000 persons aged 12 years and older occurred in 1998.

Target setting method: Better than the best.

U.S. Data Source: National Crime Victimization Survey, U.S. Department of Justice, Bureau of Justice Statistics.

15-38.   Reduce physical fighting among adolescents.

Target: 32 percent.

U.S. Baseline: 36% of adolescents in grades 9-12 engaged in physical fighting in the previous 12 months in 1999.

Target setting method: Better than the best.

U.S. Data Source: Youth Risk Behavior Surveillance Survey (YRBSS), CDC, NCCDPHP.

15-39.   Reduce weapon carrying by adolescents on school property.

Target: 4.9 percent.

U.S. Baseline: 6.9% of students in grades 9-12 carried weapons on school property during the past 30 days in 1999.

Target setting method: Better than the best.

U.S. Data Source: Youth Risk Behavior Surveillance Survey (YRBSS), CDC, NCCDPHP.

How are different populations affected?

In Michigan, homicide was the second leading cause of death for 15-34 year-olds, the third leading cause for 1-4 year olds, and the fourth leading cause of death for children 5-14 years old.

Since the 1980s, adolescents, along with other groups, have shown a steady decline in homicide rates. However, the homicide rate for blacks is approximately 13 times higher than it is for whites. In 2001, the age-adjusted rate for blacks was 32.2/100,000 compared to 2.4 for whites. The age-adjusted homicide rate is highest for black males 25-34 years old (140.2/100,000).

Men are more likely than women to be both victims and perpetrators of homicide. The age-adjusted homicide rate for men (10.9) was more than three times the rate for women (2.8). However, women represent the majority of intimate partner homicide victims. During 1999, about eight of ten intimate partner homicide victims were female. In addition, homicide occurs disproportionately in urban areas compared to other parts of Michigan.

Males are more likely to be sexual assault perpetrators and the overwhelming numbers of victims are women, adolescents, and children. Most victims know their perpetrators. Thirty-five percent of perpetrators are husbands or boyfriends, 35% are acquaintances, and 5% are other relatives. The majority of rapes and sexual assaults are committed against children and adolescents, especially adolescent females. More than 61% of all reported rape cases occur before the victim is 18 years old. Also at high risk are individuals with disabilities and women of color.

What other information is important to know?
Some of the risk factors contributing to perpetration of violence or victimization include community disorganization, exposure to family violence, poor peer relations, economic deprivation, lifestyle behaviors (e.g., weapon possession or drug use), family and/or interpersonal conflict, and media portrayal of violence.

Additional Resources:
- Michigan Department of Community Health. (1989 – 2001). Michigan Resident Death Files.
- Centers for Disease Control and Prevention. National Center for Injury Prevention and Control, Office of Statistics and Programming.
- National Center for Health Statistics.
- U.S. Bureau of Census.
- Michigan Department of Community Health. (2001). Behavioral Risk Factor Surveillance System.
- Michigan State Police. (2001). Uniform Crime Reporting Section. Uniform Crime Report.
- Rape in America. (April 1992). National Victim Center, Research & Treatment Center.
- Kilpatrick DG, Ruggiero KJ (2003). Rape in Michigan. A Report to the State – Charleston, SC: National Violence Against Women Prevention Research Center, Medical University of South Carolina.
- Warshaw C, Ganley A, Salber P. (1996). Improving the Health Care Response To Domestic Violence: A Resource Manual for Health Care Providers. San Francisco: Family Violence Prevention Fund.
- Michigan Department of Community Health. (September 1999). Violence in the Lives of Michigan Women – Results of a statewide survey (Form #DCH-0774).
- Michigan Department of Education. (2001). Michigan Youth Risk Behavior Survey.
- Michigan Department of Community Health. Violence Against Women Prevention Program, Injury Prevention Section.

Healthy Environments

Overview of Environmental Health
The definition of environmental health sciences has broadened from earlier days when it was viewed as consisting only of studies of pesticides and other chemical pollutants in our soil, air, water and food supply. Today, environmental health sciences include toxic chemical exposures as well as medicines and other therapies, occupational health and safety, and lifestyle choices. Environmental health sciences also include socioeconomic status. For example, how do the workplace, neighborhood environment and home environment of the poor affect disease, disability and premature deaths? There are many indicators that measure changes and patterns in environmental health. The four indicators chosen for the document include: 1) Work-related injury deaths, 2) Work-related injuries resulting in medical treatment, lost time from work, or restricted work activity, 3) Elevated blood lead concentrations from workplace exposure, and 4) Pesticide exposures resulting in healthcare facility visits.

Work-related Injury Deaths

Overview of Work-related Injury Deaths
An average of 17 workers die from work-related injuries each day in the U.S., and one worker dies from work-related injuries every other day in Michigan. These deaths are preventable.

How is Michigan doing?
There were 174 work-related fatal injuries in Michigan in 2001 for a rate of 3.6/100,000 employed persons. Although construction had the largest number of deaths (37 or 21%), agriculture had the highest annual death rate (52.1/100,000).

How does Michigan compare with the U.S.?
Michigan's rate over the last decade was slightly lower than the U.S. rate. Although the U.S. rate shows a slight decrease between 1992 and 2001, this trend was not evident in Michigan data.
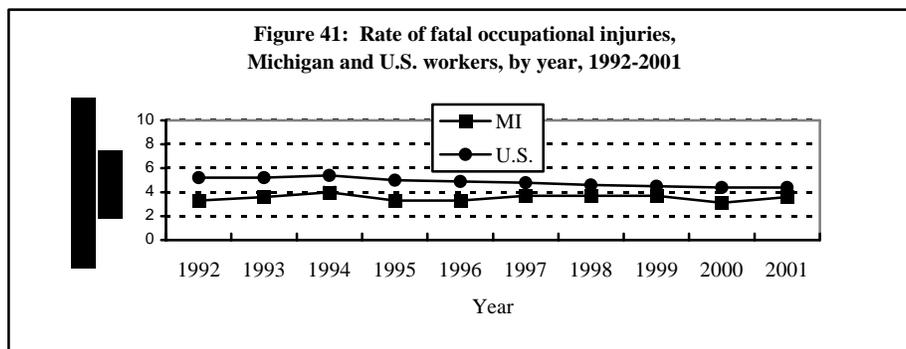
Figure 41: Rate of fatal occupational injuries, Michigan and U.S. workers, by year, 1992-2001

Healthy People 2010 goals:

How are different populations affected?

In 2001, 93% of the decedents were male, 83% were white, and the average age was 44. The death rates by age showed that the highest rate was among those aged 65 and older. The two fatal injuries to minors in 2001 are tragic sentinel events indicating the need for urgent follow-up. Children are prohibited by law from working in certain hazardous jobs.

What other information is important to know?

Michigan collaborates with the Federal Bureau of Labor Statistics (BLS) and the National Institute for Occupational Safety and Health (NIOSH) to compile a census of fatal occupational injuries based on multiple data sources. Employers are required to report all work-related fatalities to Michigan Occupational Safety and Health (MIOSHA) Program within 24 hours, and MIOSHA conducts investigations where appropriate.

Work-related Injuries

Overview of Work-related Injuries

Workplace injuries resulting in medical treatment, lost time from work, or restricted work activity have significant personal and societal costs, affecting the health and livelihood of thousands of workers each year. These injuries are not random, unavoidable events, and they are highly preventable. Workers' compensation costs in Michigan in 2001 were almost 1.5 billion dollars. The Bureau of Labor Statistics (BLS), within the U.S. Department of Labor, conducts an annual survey in all states to estimate the numbers, rates, and types of work-related injuries in the private sector, and some states, including Michigan, also conduct this survey in the public sector.

How is Michigan doing?

In 2001, private industry and state/local government employers in Michigan reported about 226,300 injury cases with a rate of 6.4/100 full-time workers. In certain industries, rates were considerably higher than the overall rate, including manufacturing (9.6) and construction (8.7).

From 1992 to 2001, Michigan's work-related injury rate decreased 32% in the private sector (9.4 to 6.4) according to BLS data, and from 9.7 to 6.4 with private and public sectors combined.

How does Michigan compare with the U.S.?

While Michigan's non-fatal work-related injury rates in the private sector have decreased recently, they have been consistently greater than national rates. The data below exclude data from state/local government because public sector data are not available in national data.

Table 19: Injury rate			
Year	**Michigan**		**U.S.**
	All Industry	Private Industry	Private Industry
1992	9.4	9.7	8.3
1993	9.3	9.5	7.9
1994	9.6	9.8	7.7
1995	9.2	9.5	7.5
1996	8.9	9.2	6.9
1997	7.9	8.0	6.6
1998	7.4	7.5	6.2
1999	6.9	7.0	5.9
2000	6.8	7.0	5.8
2001	6.4	6.4	5.4

Healthy People 2010 goals:

20-2. Reduce work-related injuries resulting in medical treatment, lost time from work, or restricted work activity.

Target: 4.3 injuries per 100 full-time workers aged 16 and older.

U.S. Baseline: 6.2 injuries per 100 full-time workers aged 16 and older in 1998.

Target setting method: 30 percent improvement.

U.S. Data Source: Annual Survey of Occupational Injuries and Illnesses, DOL, BLS, National Electronic Injury Surveillance System, CPSC.

How are different populations affected?

Demographic information is available only for cases that resulted in days lost from work and for illnesses/injuries combined (injury cases comprise 91% of all reported cases). Males comprised just over half (53%) the workforce in 2001, but they sustained two-thirds (66%) of illnesses/injuries resulting in days away from work. Workers aged 20-34 appeared to be at highest risk: they comprised 31% of the workforce but accounted for 37% of cases.

What other information is important to know?

The survey of occupational injuries and illnesses conducted by the BLS is the only nationally standardized survey measuring the burden of work-related injuries in the U.S. The BLS data provide important benchmarks for prevention efforts and are used to target intervention programs, including those of the Michigan Occupational Safety and Health (MIOSHA) program. It is important to recognize that the data is an undercount of the true number of work-related injuries for a number of reasons, including the fact that certain groups, such as the self employed and farmers with less than 11 employees are excluded from the sample.

## *Elevated Blood Lead Concentrations from Work Exposure*

Overview of Elevated Blood Lead Concentrations from Work Exposure

Current occupations known to expose workers to lead include battery manufacturing, brass and bronze manufacturing, radiator repair, construction or remodeling involving lead-based paint, and others. Despite comprehensive standards requiring the control of airborne lead in the workplace that have been in place in Michigan since the 1980s, cases of occupational lead toxicity continue to occur. Exposure to lead may cause serious health effects in adults, including

injury to the nervous system, kidneys, and blood-forming and reproductive systems in men and women.

How is Michigan doing?

Laboratory reporting of all blood lead test results has been mandatory in Michigan since late 1997, and labs have submitted reports on over 33,000 adults between 1998 and 2001. Two thousand six hundred thirteen (8%) of these individuals had a blood lead level of 10 micrograms per deciliter (µg/dL) or greater. Ten µg/dL is considered to be the upper limit for a "normal" blood lead level. In 2001, 208 individuals were reported with blood lead levels of 25 µg/dL or greater. The number reported each year with blood lead levels 25 µg/dL or greater has declined steadily from a high of 303 (1998) to 208 (2001). Almost all of these individuals were exposed to lead at work. The average annual rate for the four-year period 1998-2001 was 5.2/100,000 employed individuals.

Figure 42: Number of adults with blood lead levels ≥ 25ug/dL each year, Michigan 1998 - 2001

	303	273	235	208
	1998	1999	2000	2001

=> 25ug/dL
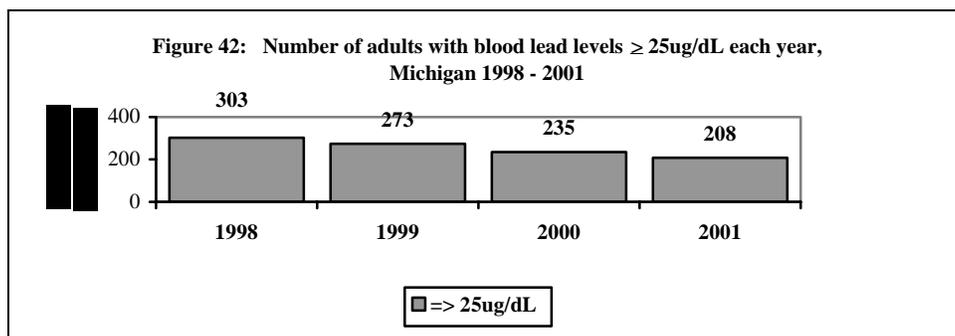
How does Michigan compare with the U.S.?

Twenty-five states, including Michigan, which participated in the national Adult Blood Lead Epidemiology and Surveillance System (ABLES) reported a combined average annual **prevalence** rate (1998-2001) for adults with blood lead levels 25 µg/dL or greater of 13.4/ 100,000 employed persons with state-specific rates varying widely from 2/100,000 to over 40/100,000. Six (24%) of the 25 states reported average annual rates lower than Michigan's rate of 5.2/100,000.

Healthy People 2010 goals:

20-7.   Reduce the number of persons who have elevated blood lead concentrations from work exposures.

Target: Zero persons per million.

U.S. Baseline: 93 per million persons aged 16-64 years had blood lead concentrations of 25 µg/dL or greater in 1998 (25 States).

Target setting method: Total elimination.

U.S. Data Source: Adult Blood Lead Epidemiology and Surveillance Program, CDC, NIOSH.

How are different populations affected?

Lab reports of individuals with blood lead tests did not provide information on race and ethnicity for more than 56% of the 10,328 adults reported. Non-whites comprised approximately 18% of the individuals on whom race/ethnicity was reported. Blacks comprised 30% of the extremely high blood lead levels (60µg/dL and greater).

What other information is important to know?

There is concern that lead at levels in blood believed to be "normal" may be causing cognitive and other subtle neurological impairments, hypertension, and kidney disease both among children and adults. Current research suggests that mandatory standards for control of lead exposure in the workplace do not adequately protect workers from adverse health effects, including impaired fertility and neurological damage to unborn children. The Michigan surveillance system found that lead-related symptoms reported by interviewed workers occurred at levels within the allowable MIOSHA standards supporting the need to lower the blood lead level that mandates medical removal.

Pesticide Exposures

Overview of Pesticide Exposures

Pesticides are substances used to prevent, destroy, repel or reduce the damage from pests. They include disinfectants, fungicides, herbicides, insecticides, and rodenticides. Averaged over a full year, poison control center data suggests that more than 20 people require medical treatment for exposures to pesticides every week in Michigan. Two regional poison control centers (PCCs) serve the state of Michigan by receiving phone calls to provide treatment advice, poison prevention information and to collect follow-up information on medical outcomes.

The voluntary aspect of PCC data collection suggests that poison centers do not capture every exposure and we should consider their data to be an underestimate of the exposures occurring.

How is Michigan doing?

During the years 2001-2002, the two regional PCCs of Michigan reported 8,481 pesticide exposure calls. Of those calls, 2,159 (25.5%) resulted in healthcare facility treatment.

The PCC in Detroit reported that the three most common pesticide exposures requiring medical treatment were anticoagulant rodenticides, hypochlorite and pine oil disinfectants and organophosphate insecticides.

How does Michigan compare with the U.S.?

The American Association of Poison Control Centers (AAPCC) summarizes the data collected by the PCCs in the U.S. each year. In 2001, the AAPCC reported that 22.4% (21,812) of pesticide exposure calls (97,176) resulted in a healthcare facility visit nationally, compared to 24.6% (1,074) of the pesticide exposures (4,369) in Michigan.

Healthy People 2010 goals:

8-13.   Reduce pesticide exposures that result in visits to a health care facility.

Target: 13,500 visits per year.

U.S. Baseline: 27,156 visits to healthcare facilities were due to pesticides in 1997. (A total of 129,592 pesticide exposures were documented in 1997).

Target setting method: 50 percent improvement.

U.S. Data Source: Toxic Exposure Surveillance System (TESS), American Association of Poison Control Centers.

How are different populations affected?

Almost 60% of pesticide exposure calls to a Michigan PCC in 2001 involved children less than six years of age. Nationally, 51% of pesticide exposure calls involved children under six years.

What other information is important to know?

Knowing proper storage and use can prevent the large majority of pesticide exposures. PCCs are dedicated to providing poison information to the general public and are an excellent source for tracking data on poison exposures in Michigan.

Additional Resources:

- Michigan Department of Community Health. (April 2003). *Injury-related mortality in Michigan, 1999-2001.*

Overview of Infectious and Emerging Diseases

Michigan has been engaged in a long-term effort to build capacity to protect the public from infectious diseases. Many familiar diseases like tuberculosis, sexually transmitted diseases, and food borne illnesses have reappeared as important causes of illness or death. In addition to these diseases with a long public health history, we have been confronted with several newly emergent diseases like HIV/AIDS, West Nile Virus, SARS, **prion-mediated** diseases (i.e., **Creutzfeld Jacob disease**), **Lyme disease**, **monkeypox**, and organisms highly resistant to antibiotics. We also face the possibility of intentional release of agents with **bioweapons** potential such as **smallpox**, plague, and anthrax.

Improvements to surveillance, laboratory characterization, and control of communicable diseases will be central to public health's ability to detect and respond to outbreaks of new or unusual diseases including those both naturally occurring and intentionally caused. Michigan's public health system has been very successful in reducing the occurrence of many communicable diseases that historically caused significant illness and death. However, as the following chapters reveal, we continue to see sustained transmission and/or increases in many of these infectious diseases. Future success in controlling these pathogens will depend on our ability to obtain better reporting, enhancing epidemiology and surveillance systems, increasing capacity for laboratory testing, developing more education and training for providers, and developing programmatic interventions that effectively interrupt transmission and decrease occurrence of disease.

Infectious and Emerging Diseases

Overview of Anti-microbial Resistance

The emergence of **antimicrobial resistant** organisms is a growing challenge in the prevention and control of communicable diseases and a major threat to patient safety. It is a looming threat for any illnesses that require antibiotics, antivirals, etc. for treatment. Early detection, accurate knowledge about risk, transmission, changes in trends, and effective intervention against these life-threatening organisms are important components of the efforts made by the Anti-microbial Resistance Program within the Bureau of Epidemiology and Laboratories to protect our citizens.

How is Michigan doing?

Data collected from 33 Michigan hospital labs participating in sentinel surveillance to monitor the occurrence of penicillin-resistant _Streptococcus pneumoniae_ (PRSP) and **vancomycin-resistant** _Enterococcus faecium_ and _faecalis_ (VRE) from 1998-2002, shows an increase in resistance for each of the organisms monitored in this surveillance system.

Figure 43: Increasing PRSP and VRE in Michigan, 1998-2002
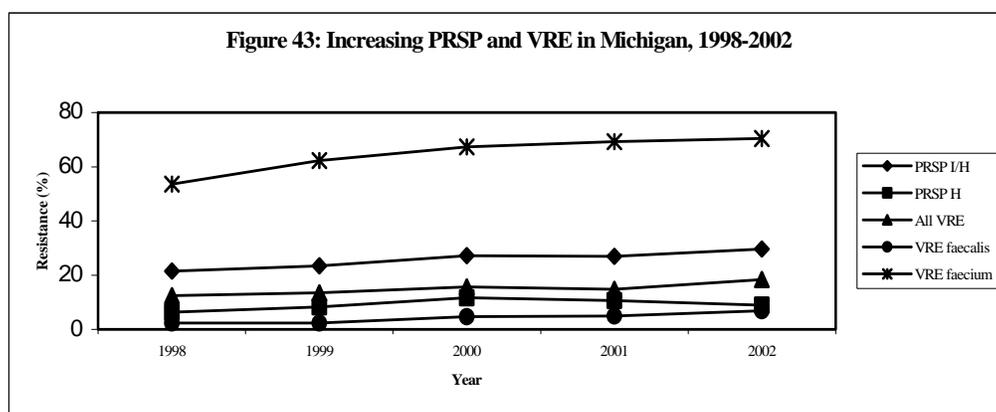
Michigan hospital labs report increasing numbers of **methicillin-resistant** _Staphylococcus aureus_ (MRSA). **Antibiogram** data collected from 2000 and 2001, from over 80 Michigan hospitals, reveals a range of MRSA isolates from 8% to 76%. In June 2002, Michigan investigated the first clinical case of vancomycin-resistant _Staphylococcus aureus_ (VRSA). Vancomycin is the most commonly used treatment for MRSA infections. This transition in the resistance pattern of _S. aureus_ is a warning of the infections to come if resistant organisms are not dealt with seriously.

Healthy People 2010 goals:

> Healthy People 2010 objectives address issues that assist in the prevention and control of antibiotic resistance, however, there are no objectives that directly address surveillance for monitoring the emergence, acquisition, and transmission of resistant organisms.

Overview of E. coli O157

Escherichia coli (E. coli) O157 is an infectious cause of food borne illness typically associated with eating undercooked contaminated ground beef. E. coli often leads to bloody diarrhea and may progress to the sometimes fatal **Hemolytic Uremic Syndrome** (HUS), where the kidneys and red blood cells are damaged. Children under age five and the elderly are more susceptible to HUS.

How is Michigan doing?

Outbreaks have accounted for fluctuations in E. coli illness activity in Michigan. Outbreaks have included small groups in localized areas of Michigan as well as large-scale outbreaks involving contaminated retail products in other states. Ground beef, steaks, and alfalfa sprouts are some foods linked to Michigan outbreaks. The annual incidence of reported E. coli cases in Michigan increased from 1.18-cases/100,000 in 1998 to 1.42 in 2000, and then declined to 1.35 in 2002.

| Table 20: E. coli O157 Cases Michigan 1998 - 2002 ||
Year	Cases
1998	117
1999	127
2000	141
2001	103
2002	134

Healthy People 2010 goal:

10-1.   Reduce infections caused by key food borne pathogens.

Target and U.S. Baseline:

Objective	Reduction in infections caused by microorganisms	1997 Baseline	2010 Target
		Cases per 100,000	
10-1b.	Escherichia coli O157:H7	2.1	1.0

Target setting method: 50 percent improvement.

U.S. Data Source: Food borne Disease Active Surveillance Network CDC, NCID; FDA, CFSAN; FSIS, OPHS.

How does Michigan compare with the U.S.?

Michigan ranks 10th in the nation based on the number of *E. coli* cases reported in 2002. Michigan reported 622 cases in the last five years (1998-2002), averaging 125 cases per year. An average of 4000 cases of *E. coli* are reported each year in the U.S. Because milder cases may not be diagnosed or reported, the CDC estimates that there are actually about 73,000 cases each year.

How are different populations affected?

In Michigan, 40% of the reported cases of *E. coli* in 2002 were children age 19 and under. There were slightly more female than male cases reported. About one-third of the cases were residents of Southeast Michigan, with the remaining cases spread across the state.

Overview of Salmonella

Salmonella is one of the leading causes of bacterial food borne illness in Michigan, producing diarrhea, abdominal pain, nausea, and fever lasting four to seven days. Severe infections can be life threatening or lead to chronic conditions such as arthritis and kidney disease. The elderly, the very young, and those with a compromised immune systems tend to be most affected.

How is Michigan doing?

Michigan ranks 16th in the nation based on the total number of cases reported in 2002. Nearly one-fifth of these cases were children age 0-4 years. Half of the cases were residents of Southeast Michigan. The annual incidence of reported **salmonellosis** in Michigan has steadily decreased over the past five years (1998-2002), from 11.8-cases/100,000 population to 8.8.

Outbreaks of salmonellosis have occurred in Michigan ranging from small, localized outbreaks to large-scale outbreaks from contaminated retail food products in other states. Recently, strains of *Salmonella* have emerged that are resistant to treatment with multiple antibiotic medications. Michigan has had several confirmed outbreaks involving these multi-drug resistant strains, which remain an important public health challenge.

Table 21: Salmonellosis Cases Michigan 1998 - 2002	
Year	Cases
1998	1169
1999	973
2000	904
2001	866
2002	875

How does Michigan compare with the U.S?

A total of 4,787 cases of human salmonellosis were reported in Michigan during the last five years (1998-2002), averaging 960 cases per year. About 40,000 cases of salmonellosis are reported in the U.S. annually. Because milder cases may not be diagnosed or reported, the true number of infections is believed many times greater (30-40 fold).

Healthy People 2010 goals:

10-1. **Reduce illness caused by key food borne pathogens.**

Target and U.S. Baseline:

Objective	Reduction in infections caused by microorganisms	1997 Baseline	2010 Target
		Cases per 100,000	
10-1d.	Salmonella species	13-7	6.8

Target setting method: 50 percent improvement.

U.S. Data Source: Foodborne Disease Active Surveillance Network, CDC, NCID; FDA, CFSAN; FSIS, OPHS.

Overview of Lyme Disease

Lyme disease, a tick-borne illness caused by the bacteria *Borrelia burgdorferi*, has been diagnosed in Michiganians. This organism requires an *Ixodes scapularis* tick for its transmission, and the tick requires the presence of small rodents and deer to complete its life cycle. In Michigan, Menominee County is a recognized niche for this tick and bacteria. Recent research has indicated that a new **endemic** area may be emerging in the Southwest Lower Peninsula.

How is Michigan doing?

Since 1998, a stable number of Lyme disease cases were reported in Michigan, averaging 20 cases annually. However, some cases were from travel to other states where it is endemic.

How does Michigan compare with the U.S.?

Nationally, from 1998-2001, an average of 16,958 cases of Lyme disease were reported to the CDC. Michigan cases account for about 1 of 1000 of the cases that occur in the U.S. annually.

Table 22: Lyme Disease Cases in Michigan 1998-2002			Table 23: Lyme Disease Cases in U.S. 1998-2002	
Year	*Number of Cases*		*Year*	*Number of Cases*
1998	18		1998	16,801
1999	11		1999	16,273
2000	23		2000	17,730
2001	21		2001	17,029
2002	26		2002	N/A

Healthy People 2010 goal:

14-8.   Reduce Lyme disease.

Target: 9.7 new cases per 100,000 population in endemic states.

U.S. Baseline: 17.4 new cases of Lyme disease per 100,000 population were reported in 1992–96.

Target setting method: 44 percent improvement. (Better than the best will be used when data are available).

U.S. Data Source: National Notifiable Disease Surveillance System (NNDSS), CDC, EPO.

What other information is important to know?
Cases of Lyme disease in Michigan have been fairly stable over the past several years. The emergence of a new endemic area may trigger an increase in cases for the state. Efforts are underway to make Michigan clinicians aware of the potential for Lyme disease transmission to occur in these areas, and what diagnostic services are available to them. Educating the public about the risks, and the ways to avoid exposure to potential disease-carrying ticks is important.

Overview of Tuberculosis (TB)
The rate of TB in Michigan has been on a steady decline, although the rate of decline is slowing. Michigan's TB case rate was 5.2/100,000 population in 1993, and has dropped to 3.2 in 2002.

How is Michigan doing?
Two-thirds of Michigan's TB cases reside in the Detroit metropolitan area. The case rate in Michigan ranked 30th nationally according to the CDC.

How does Michigan compare to the U.S.?
In 2002, the U.S. recorded the lowest TB rate (5.2/100,000) since reporting began in 1953.

Figure 44: Number of Tuberculosis (TB) Cases, Michigan 1997 - 2002

373   385   351   287   330   315

1997   1998   1999   2000   2001   2002
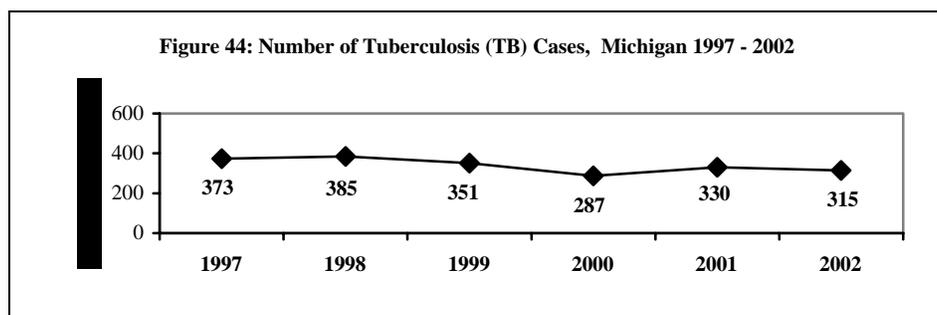
Healthy Michigan 2010 goals:

14-11.   Reduce Tuberculosis.

Target: 1.0 cases per 100,000 population.

U.S. Baseline: 6.8 new cases of tuberculosis per 100,000 population were reported in 1998.

Target setting method: Better than the best.

**U.S. Data Source:** National TB Surveillance System, CDC, NCHSTP.

How are different populations affected?

The burden of TB continues to be felt disproportionately in Michigan by minority racial and ethnic groups. In 2002, blacks represented 43.1% of Michigan's 315 cases. Those disparities are greatest in Detroit. In 2002, Detroit, including the communities of Highland Park and Hamtramck, continued to report the highest number of TB cases in Michigan with 93 cases and an incidence rate of 9.4/100,000 population.

A trend in Michigan and across the nation is the increasing percentage of TB cases in foreign individuals. In 2002, 38% of reported cases in Michigan were foreign-born. This represents a 23% increase in foreign-born cases since 1997.

Overview of HIV/AIDS

The impact that HIV/AIDS has on society has shifted over the past 25 years. Early in the **epidemic**, there was very high **mortality** from infected individuals progressing to AIDS. With increased use of **anti-retroviral** therapies, infected individuals are living longer. More individuals are living with HIV in Michigan than ever before and, with less HIV-related **morbidity**, there is an increased risk of HIV transmission. HIV is a major cause of disability to people in the peak of their wage earning years, causing a strain in productivity in those individuals infected and their families and communities. HIV-infected women of childbearing age are also living longer and have more opportunities to become pregnant and potentially pass HIV on to their children, continuing the need for ongoing prenatal care and HIV testing.

Figure 45: HIV-Related Deaths in Michigan, all ages, by Gender and Race 1989-2001
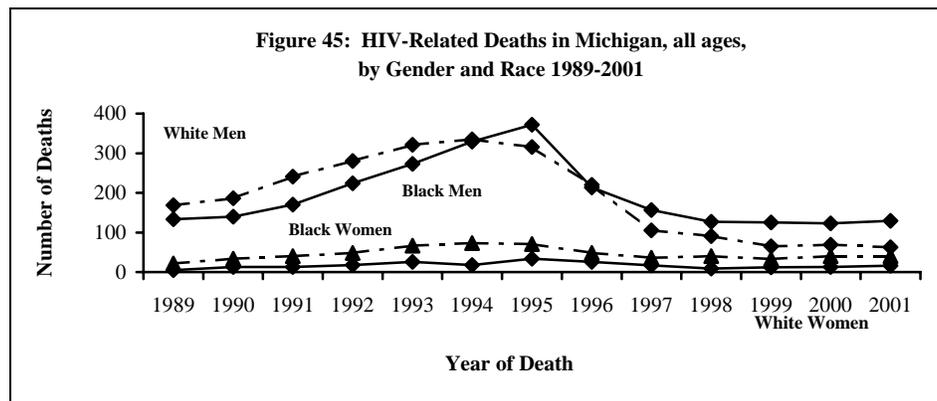
Source: MDCH Bureau of Epidemiology HIV/AIDS Surveillance Section as of 1/1/02

How is Michigan doing?

An estimated 15,500 Michigan residents are living with HIV infection and approximately one quarter of these individuals do not know their HIV **serostatus**. Between 1997 and 2001, new

diagnoses of HIV were roughly level showing approximately 1,000 persons diagnosed with HIV or AIDS each year. An estimated 229,000 Michigan residents are at substance abuse risk for HIV infection and another 259,000 are at continued sexual risk of HIV infection. Conservatively, about 4.9% of the Michigan's population is at continued behavioral risk for HIV/AIDS.

Many individuals learn they have HIV late in the course of their infection. This has implications for both prevention and medical management of the disease. In the past five years, around 25% of women and 29% of men were diagnosed with AIDS within one month of learning they were infected with HIV.

The number of HIV-related deaths in Michigan declined by 20% between 1997 and 2001. Deaths among white males decreased by 23% and deaths among black males decreased by 18%. The number of deaths to black females increased by 11% and the number of deaths to white females remained unchanged.

Perinatal transmission of HIV continues to occur in Michigan infants, with three cases in 2002. Most perinatal transmission occurred among women who presented for labor/delivery without documentation of being tested for HIV and were not, subsequently tested for HIV. These cases represent a significant missed opportunity for prevention.
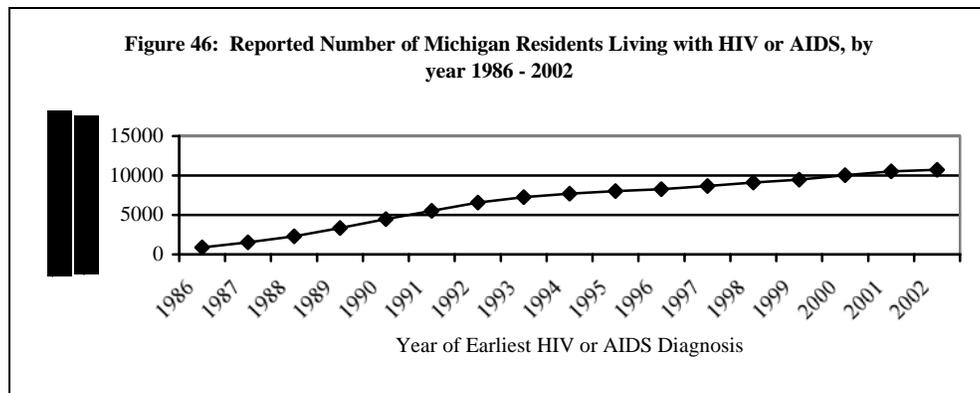
Figure 46: Reported Number of Michigan Residents Living with HIV or AIDS, by year 1986 - 2002

Year of Earliest HIV or AIDS Diagnosis

Source: MDCH/Bureau of Epidemiology HIV/AIDS Surveillance Section as of 1/1/02

Figure 47: Persons Living with HIV/AIDS in Michigan, by Mode of Transmission (n= 10,517)

Male-Male Sex 46%
Undertermined Other 5%
Male-Male Sex/IDU* 5%
IDU* 16%
Blood 1%
Perinatal 1%
Heterosexual 13%
Undetermined/ Presumed Hetero. 13%
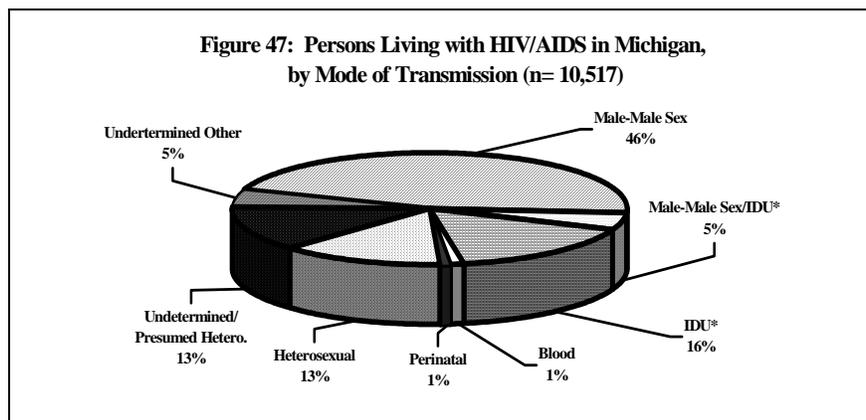
Source: MDCH/Bureau of Epidemiology/HIV/AIDS Surveillance Section as of 1/1/03 *IDU = Injecting Drug User

How does Michigan compare to the U.S.?
Michigan ranks number 17 in number of AIDS cases and 31st in the AIDS rate within the U.S.

Healthy People 2010 goals:

> **13-1.**   **Reduce AIDS among adolescents and adults.**
>
> **Target**: 1.0 new case per 100,000 persons.
>
> **U.S. Baseline:** 19.5 cases of AIDS per 100,000 persons aged 13 years and older in 1998. Data are estimated; adjusted for delays in reporting.
>
> **Target setting method:** Better than the best.
>
> **U.S. Data Source:** HIV/AIDS Surveillance System, CDC, NCHSTP.

How are different populations affected?

Men who have sex with men continue to be the most affected by HIV/AIDS, accounting for 52% of new HIV/AIDS diagnoses each year between 1997 and 2001. Among all cases reported between 1997 and 2001, 24% were attributable to heterosexual transmission and 18% to injecting drug use. Blacks are impacted by HIV disproportionately to the general population. They make up 14% of Michigan's general population, but 58% of all persons living with HIV/AIDS (PLWHA). Hispanics account for 4% of HIV/AIDS cases and 3% of the population.

- Detroit accounts for ten percent of the population of Michigan but 44% of the estimated total number of PLWHA (6,880/15,500) in Michigan.
- It is estimated that as many as one of every 140 (703/100,000) Detroit residents is infected with HIV, while as many as one of 1,020 (98/100,000) residents of Michigan outside Detroit are estimated to be HIV-infected – a sevenfold difference.
- While HIV disease still affects three males for every one female, the rate for black females is over two and a half times higher than the rate for white males; the rate among black males is the highest in the state – seven and a half times higher than among white males.
- In Detroit, 78% of PLWHA are between the ages of 20 and 44. The **Years of Potential Life Lost (YPLL)** due to AIDS are 480.5 and 183.7 YPLL for black and white residents of Detroit, respectively, for 2001.

Figure 48: Prevalence Estimates of Persons Living with HIV/AIDS in Michigan by Gender and Race

Figure 49: Case Rates of Persons Living with HIV/AIDS in Michigan by Gender and Race
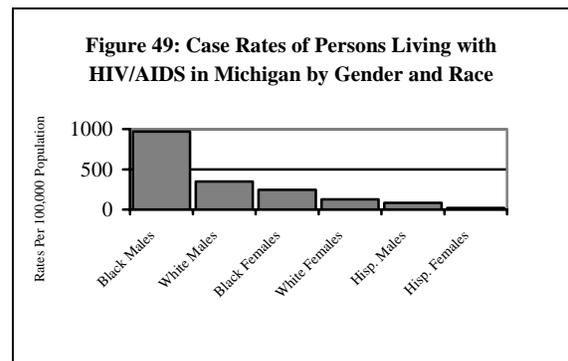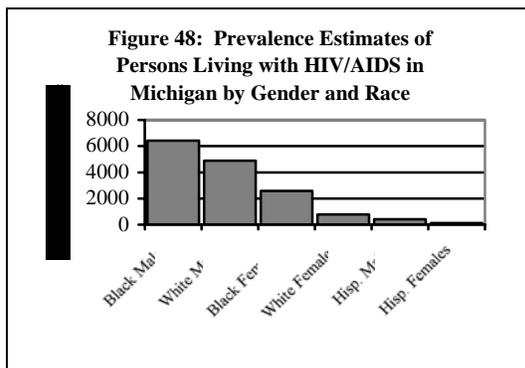
Source: MDCH/Bureau of Epidemiology HIV/AIDS Surveillance Section as of 1/1/03

What Other Information is Important to Know?

Research has suggested a range of prevention interventions that have been documented to be effective in promoting adoption and maintenance of attitudes and behaviors that reduce risks for transmission and/or acquisition of HIV/AIDS. Data obtained through ongoing needs assessments

conducted by MDCH suggest prevention needs are highly variable according to risk population, age, gender and other factors. For this reason, MDCH supports a range of highly targeted, evidence-based interventions including individual level prevention counseling, prevention case management, multi-session group-level skills-building workshops and peer-led community level interventions. Routine quality assurance and program evaluation are key to monitoring fidelity of these interventions, thereby ensuring their effectiveness. Emphasis has been placed on supporting relatively intensive, skills-based interventions.

Effective medical therapies for HIV has resulted in HIV-infected individuals living longer, higher quality lives. This underscores the need to support evidence-based primary prevention interventions designed to support adoption of behaviors to prevent HIV transmission to others.

HIV counseling and testing (CT) and partner counseling and referral services (PCRS) remain the cornerstone of Michigan's prevention response. Epidemiologic data that demonstrates that a significant proportion of individuals have not yet learned their HIV serostatus. Many persons do not learn their HIV status until late in their infection. This suggests the need to refine CT and PCRS activities to promote knowledge of serostatus and facilitate utilization of such services. MDCH has recently adopted rapid HIV testing as a means to increase access to and utilization of CT, placing it in venues in high **prevalence** areas or serving high risk populations, including sexually transmitted disease clinics and hospital emergency rooms.

Primary and Secondary Syphilis

In 2002, Michigan had the fourth highest number of reported cases (486) in the U.S. Michigan's rate in 2002 (4.9/100,000) was higher than the U.S. rate (2.4), because of high syphilis rates in Detroit (40.4). Unlike other urban areas around the country, syphilis in Detroit is primarily transmitted in the heterosexual population. In 2003, due to successful initiatives, cases in Michigan dropped 48% and in Detroit, 52%.

Efforts to decrease the number of cases include collaborating with local community-based organizations to screen/educate at-risk patients, strengthening educational efforts for the public and medical care providers, providing adequate diagnostic and treatment facilities, and increasing surveillance and case management efforts.

Figure 50: Primary and Secondary Syphilis Rates per 100,000 population 1998 - 2002 Michigan and Detroit

Health People 2010 goals:

Gonorrhea

Gonorrhea is the second most frequently reported communicable disease in Michigan. Michigan's rate in 2002 (148.6/100,000) was higher than the U.S. rate (125.0), in part because of high rates of gonorrhea in Detroit (719.6). In 2003, cases in Michigan dropped 5% and in Detroit, 20%


Figure 51: Gonorrhea Rates per 100,000 population 1998 - 2002 Michigan and Detroit

Healthy People 2010 goal:

Chlamydia

Chlamydia is the most frequently reported communicable disease in Michigan. Michigan's 2002 rate (324.7/100,000) was higher than the U.S. (296.5), partly due to high rates in Detroit (1195.7). In 2003, cases in Michigan rose 2%, but dropped in Detroit by 11%.

**Figure 52: Chlamydia Rates per 100,000 population
1998 - 2002 Michigan and Detroit**
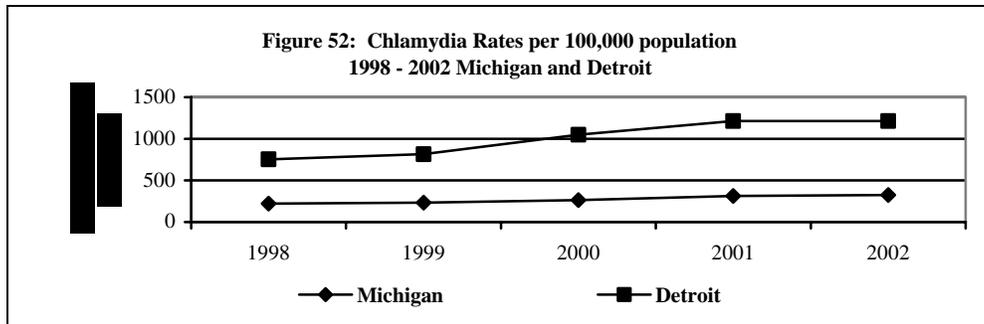
Efforts to control and reduce gonorrhea and chlamydia include screening and treatment for both diseases, especially for those most at risk, namely adolescents and young adults, such as those in juvenile detention settings.

*Healthy People 2010 goals***:**

25-3.   Reduce the proportion of adolescents and young adults with *Chlamydia trachomatis* infections.

Target and U.S. Baseline:

Objective	Reduction in *Chlamydia trachomatis* infections	1997 Baseline	2010 Target
		Percent	
25-1a.	Females aged 15 to 24 years attending family planning clinics	5.0	3.0
25-1b.	Females aged 15 to 24 years attending STD clinics	12.2	3.0
25-1c.	Males aged 15 to 24 years attending STD clinics	15.7	3.0

Target setting method: Better than the best.

U.S. Data Source: STD Surveillance System, CDC, NCHSTP.

Quinolone-Resistant Neisseria gonorrhoeae (QRNG)

Gonococcal resistance surveillance began in July 2002 because **QRNG** is increasing in the U.S. Fourteen cases have been identified in 2003, compared with one case in 2002. Treatment guidelines were updated for six counties in mid-Michigan, restricting quinolone use. All local health departments in Michigan have been alerted to administer appropriate treatment for persons suspected of having QRNG.

What other information is important to know?

Sexually transmitted infections in women and men contribute to infertility affecting approximately 14% of all couples in the U.S. at some time. For example, complications due to chlamydia and gonorrhea infections account for 15% of cases of infertility in women.

There are many different types of Human Papilloma Virus (HPV), a sexually transmittable virus that causes genital warts. While most women with HPV do not develop cervical cancer, four HPV subtypes are responsible for an estimated 93% of cervical cancer cases, with an estimated 5.5 million new cervical cancer cases occurring per year.

Emerging Diseases

Monkeypox

Monkeypox is a rare viral disease of rodents that can be transmitted to humans. Prior to 2003, monkeypox was only known to occur in countries in central and western Africa. It can be transmitted to other animals such as monkeys. Humans and person-to-person transmission has occurred. The case fatality rates ranged from one percent to ten percent of those infected. In June 2003, unusual illnesses with pox-type lesions were diagnosed in individuals in the U.S. who had contact with prairie dogs. These prairie dogs were traced to a particular animal distributor, and to exposure to animals imported from Africa. To date, 72 human cases of potential monkeypox have been investigated in the U.S. and 37 cases have been confirmed. Although several animals in Michigan were potentially exposed to the disease through the exotic animal trade, extensive investigation revealed no human cases and no diseased animals in the state.

This represents another emerging infectious disease with the potential to become established in the U.S. and gravely impact native species and human health. The CDC and Food and Drug Administration (FDA) issued an emergency order that bans the importation, interstate movement, sale, or release into the wild of six species of African rodents, as well as domestic prairie dogs. In addition, Michigan issued a similar order to cover intrastate movement, sale, or release into the wild of these species. This outbreak revealed gaps in regulation of the trade in exotic animals in the U.S. As a result of this experience, more restrictions in the exotic animal trade and changes to allow for the tracing of these transactions may occur.

Severe Acute Respiratory Syndrome (SARS)

Severe Acute Respiratory Syndrome (SARS) is an emerging infectious disease with cases first reported in February 2003 from Asia. By the summer of 2003, cases had been documented in Asia, North America and also Europe. State surveillance began for SARS, working collaboratively with local and other state and federal officials.

The number of suspect and probable cases of SARS were reported to the CDC on a daily basis by Michigan according to the CDC definition. By the end of the 2003 outbreak it was determined that Michigan had no cases of suspect or probable cases after review of 67 potential cases of SARS. According to the CDC there were 192 suspect and probable cases identified in the U.S. at the close of the 2003 outbreak. Through July 11, 2003, Canada reported 250 cases.

A federal executive order added SARS to the list of U.S. **quarantinable** communicable diseases in April 2003. The emergence of SARS has resulted in many questions related to quarantine and isolation of affected individuals. Fear of SARS has also led to the stigmatization of individuals from certain geographic areas.

West Nile Virus

West Nile Virus (WNV) is a mosquito-borne virus of birds that can be transmitted to humans and horses. In humans, most people who are bitten by an infected mosquito do not get sick, but about one in five will develop some type of mild illness. About one in 100 people infected with WNV will develop a more serious form of the disease, such as **meningitis, encephalitis**, or **flaccid paralysis**. About ten percent of those patients with encephalitis may die. The elderly and **immunocompromised** are more likely to develop the severe form of the illness.

Nationally, WNV was first discovered in the U.S. in 1999, and spread from the East to the West Coast through 2002. Michigan's first WNV activity was discovered in birds and mosquitoes in 2001. In 2002, several factors contributed to the development of an **epizootic** and **epidemic** of WNV in the central United States. Michigan suffered the second highest number of human cases in the nation with 644 laboratory positive cases, and 51 deaths. Surveillance efforts revealed WNV positive birds, horses, and mosquitoes in many Michigan counties. Nationally, over 4,156 people were sickened and 284 people died.

Like the other mosquito-borne viruses that occur sporadically in Michigan, WNV is expected to continue to be an issue for the citizens of Michigan.

KEY TERMS AND DISCLAIMERS

Acute Care Hospitals	Those Hospitals that provide or are concerned with short-term medical care especially for serious acute disease or trauma.
Acute illness	An illness that has a sudden onset, sharp rise, and short course.
Aggravated assault	An unlawful attack by one person upon another for the purpose of inflicting severe or aggravated bodily harm. It is usually accompanied by the use of a weapon or other means likely to produce death or great bodily harm.
Amniotic fluid embolism	The sudden embolization of amniotic fluid or debris of fetal origin into the maternal circulation that triggers an allergic reaction that results in cardiovascular (heart and lung) collapse. It is a rare obstetric catastrophe with reported mortality rates ranging from 26% to 86%.
Anti-biogram	A series of test results that are provided by the laboratory for a particular organism, which indicate what antibiotics will be effective for treatment.
Antibiotic-resistant organism	Refers to the specific antibiotic with which an organism can no longer be effectively treated (i.e. penicillin-resistant, **Methicillin-resistant, Vancomycin-resistant, Quinolone-resistant).**
Anticipatory guidance	A: Information given about upcoming developmental events or anticipated problems (such as information about the next pregnancy for women who have lost an infant) B: The regulation of a system or process based on anticipated events (feed-forward rather than feedback system).
Anti-microbial resistant organism	Refers to an organism that cannot be effectively treated with the antibiotics (i.e. anti-microbials) that are normally used against it. This means that when these organisms cause an infection, certain drugs no longer work to fight them.
Anti-retroviral therapy or drugs	Drugs acting, used, or effective against retroviruses.
Atherosclerotic	Results from the process of progressive thickening and hardening of the walls of medium-sized and large arteries as a result of fat deposits on their inner lining.
Attribution Bias	Some deaths among men with prostate cancer are mistakenly attributed to (thought to be caused by) the prostate cancer when the death was actually due to another cause. That is, the man died *with* prostate cancer, not *of* prostate cancer.
Behavioral Risk Factor Survey (BRFS), Michigan	Part of a National surveillance system that comprises the largest health survey in the world. It is the primary source of state-specific estimates for behaviors, conditions and preventive health practices that are associated with the leading causes of morbidity and mortality. It is especially relevant to public health as it measures risk factors that are preventable.
Bio-weapon	Any organism (bacteria, virus or other disease-causing organism) or toxin found in nature, used as a weapon.
Birth rate (age-specific)	Number of live births to resident women of a specific age group in a defined

geographic area divided by the total resident female population of that specific age group and area, then multiplied by 1,000 to generate the rate per 1,000.

Birth rate (crude)	Number of live births to resident women of a defined geographic area divided by the area's total resident population, then multiplied by 1,000 to generate the birth rate per 1,000.
Body Mass Index (BMI)	A measure that adjusts body weight for height. It is calculated as weight in kilograms divided by height in meters squared. A *healthy weight* for adults is defined as a BMI of 18.5 to less than 25. **Note:** Overweight for children and adolescents is defined as BMI at or above the sex-and age-specific 95th percentile BMI cut points from the 2000 CDC Growth Charts, which can be found at http://www.cdc.gov/growthcharts/
Bronchi (bronchus)	The large air tubes leading from the trachea to the lungs.
Cancer – *Distant stage*	Refers to cancer that has spread from the original (primary) tumor to distant organs or distant lymph nodes.
Cancer – *Local stage*	Represents invasive cancer confined to the organ of origin.
Cancer – *Regional stage*	Represents direct extension to adjacent organs or tissues or involvement of the regional lymph nodes.
Catheterization	A diagnostic procedure for evaluating certain problems with the heart and its blood supply. It involves the placement of a long, thin tube (a catheter) into the heart to measure pressures, inject dye, and take X-ray pictures. This information may be necessary in order for your doctor to decide whether surgery is necessary or not and what type of problem exists within your heart and circulatory system. It allows him to create an appropriate treatment plan for a patient.
Celiac disease	A disorder resulting from an immune reaction to gluten, a protein found in wheat, oats, barley, and rye, and present in many foods causing impaired absorption and digestion of nutrients through the small intestine.
Chronic Illness	A: Indicates suffering from a disease or ailment marked by long duration, by frequent recurrence over a long time, and often by slowly progressing. B: A disease or ailment having a slow progressive course of indefinite duration - used especially for degenerative invasive diseases, some infections, psychoses, and inflammations. C: Indicates being infected with a disease-causing agent (such as a virus) and remaining infectious over a long period of time but not necessarily expressing symptoms. Carriers may remain healthy but still transmit the virus.
Chronic Lower Respiratory Disease (CLRD)	Includes bronchitis, emphysema and chronic obstructive pulmonary disease (COPD); ICD-10 codes J40-J47
Clinically diagnosed Diabetes	A group of diseases characterized by high levels of blood glucose resulting from defects in insulin production, insulin action or both.
Congenital anomaly	A marked disorder or defect present at birth often genetically transmitted to the child from a parent.

Colonoscopy	An endoscopic examination of the inside of the rectum and entire colon using a flexible, lighted instrument (a colonoscope) that is inserted into the rectum. If polyps are found they can be removed at the same time.
Contraindications (to vaccination)	Something (such as a symptom or condition) that makes a particular treatment or procedure inadvisable (as to vaccinations).
Creutzfeldt Jacob Disease	A rare prion disease, associated with a number of genetic mutations, having a wide variety of clinical and pathologic features. The most commonly seen features involve dementia and progressive neurological decline. Death generally occurs within one year of onset.
Cystic Kidney Disease	A hereditary disease that causes cysts to develop in the kidneys. It can cause destruction of functioning kidney tissue and result in kidney failure.
Diabetes (Type-2)	The most common type of diabetes usually beginning as insulin resistance, a disorder in which the cells do not use insulin properly. As the need for insulin rises, the pancreas gradually loses its ability to produce insulin.
Diagnosable mental disorder	Any cluster of symptoms that meets the criteria for a mental illness enumerated in either the International Classification of Diseases, Ninth Edition (ICD-9), or the Diagnostic and Statistical Manual of the American Psychiatric Association, 4th Edition (DSM-IV).
Diphtheria	An acute febrile contagious disease marked by the formation of a false membrane especially in the throat and caused by a bacterium, which produces a toxin causing inflammation of the heart and nervous system.
DSM-III-R	A short form of 'Diagnostic and Statistical Manual of Mental Disorders, 3rd Edition, revised'. A classification of mental disorders used by most mental health professionals in USA.
DTaP Vaccine	Vaccination to protect against **diphtheria**, **tetanus** and **pertussis**. (See individual definitions in glossary)
Eclampsia	Convulsions (seizures) occurring with pregnancy-associated high blood pressure and having no other cause.
Escherichia coli (E-coli) O157	A gram-negative bacteria that is often associated with intestinal infections in people or animals.
Efficacy	Capacity or power to produce a desired effect.
Embolitic (embolism)	Sudden blocking of an artery by a clot or foreign material that has been brought to the site by the bloodstream.
Encephalitis	Inflammation of the brain.
Endemic	Present or usually prevalent in a population or geographic area at all times.
Epidemic	An outbreak of a contagious disease that spreads rapidly and by affecting many individuals in an area or a population at the same time.
Epizootic	Disease attacking many animals in any region at the same time: widely diffused and rapidly spreading.

Family Psycho-education	Evidence-based practice shown to reduce relapse rates and facilitate recovery of persons who have a mental illness. Models emphasize providing families with an ill family member emotional support, information about the nature of serious mental illness, resources during crisis, and structured problem-solving training.
Federal Poverty Level (FPL)	In February of each year the Federal Government releases an official income level for poverty. The benefit levels of many low-income assistance programs are based on these poverty figures. 2003 poverty guidelines can be found at http://aspe.hhs.gov/poverty/03poverty.htm
Federally-Qualified Health Center (FQHC)	Private, non-profit or public organizations that receive federal grants from the Health Resources and Services Administration (HRSA) Bureau of Primary Health Care (BPHC) through Section 330 of the Public Health Service Act. Their mission is to improve the health status of underserved populations.
Federally-Qualified Health Center look-alike	The Federally Qualified Health Center provision is also available to organizations that meet all of the federally funded Community Health Center program expectations, but do not receive federal operating grants under the Section 330 Public Health Service Act. Such organizations are formally designated Federally Qualified Health Center Look-alikes by the U.S. Department of Health and Human Services.
Fetal Deaths	Those deaths to infants that occur before the seventh day of life.
Fibromyalgia	A syndrome characterized by chronic pain, stiffness, and tenderness of muscles, tendons, and joints without detectable inflammation.
Flaccid paralysis	Paralysis where muscle tone is lacking in the affected muscles and tendon reflexes are decreased or absent
Gastroenteritis	Inflammation of the stomach and the intestines causing nausea, vomiting and/or diarrhea.
Glomerulonephritis	Describes a group of diseases that damage the part of the kidney that filters blood. If the illness continues, the kidneys may stop working completely. Also known as nephritis or nephritic syndrome.
Gonococcal infection	A sexually transmitted disease caused by a bacterium of the genus Neisseria.
Health Maintenance Organization (HMO)	A type of prepaid medical service in which members pay a monthly or yearly fee for all health care, including hospitalization. Because costs to patients are fixed in advance, preventive medicine is stressed to avoid costly hospitalization.
Hemolytic Uremic Syndrome	An uncommon sequelae to E. coli infection found more often in children. It involves acute kidney failure and acute anemia.
Hemorrhage	Bleeding or the abnormal flow of blood.
Hemorrhagic Stroke	Accounts for 10 to 15 percent of all cases of stroke where bleeding in the brain (**intracerebral** hemorrhage) or between the brain and the skull (**subarachnoid** hemorrhage) disrupts brain function. Bleeding usually occurs due to a rupture in arterial walls that are already weakened by high blood pressure. A pool of blood compresses brain tissue in its vicinity preventing adequate amounts of fresh blood from reaching the area.
Hepatitis B Virus (HBV)	Caused by a virus that attacks the liver and can cause lifelong infection, cirrhosis

(scarring) of the liver, liver cancer, liver failure, and death.

Hib (H. Influenzae Type B)	A serotype of a bacterium of the genus *Haemophilus* that causes bacterial meningitis and pneumonia, especially in children.
Indolent	Causing little or no pain; Slow to heal, grow, or develop, inactive.
Intracerebral hemorrhage	See hemorrhagic stroke
Illicit drugs	Drugs not sanctioned by custom or law. Unlawful.
Immuno-compromised	Having the immune system impaired or weakened (as by drugs or illness).
Incidence	The number of occurrences, typically an illness, during a period of time among a specific population, sometimes used to mean *Incidence rate.* Incidence rate is the rate of new occurrences, over time, in a population. The number of new occurrences during this given period of time (often one year) is divided by the number in the population at risk for experiencing the occurrences during the same time period.

Kessner Index (prenatal care)

Kessner Measurements:

Adequate: Care that began within the first trimester and included an average of at least one or two additional prenatal visits per month of gestation, depending on the length of gestation.

Intermediate: Care that began during the second trimester of pregnancy with correspondingly fewer visits, or began during the first trimester but with fewer visits than would be appropriate for the length of gestation.

Inadequate: When no care was received or if care began during the third trimester. It is also inadequate if care began during the first or second trimester but less than five visits occurred, when the length of gestation was 34 weeks or more. When the length of gestation was less than 34 weeks, care is defined as inadequate when care began during the first or second trimester but a number of visits less that four occurred, that number depending on the actual weeks of gestation.

Kotelchuck Index (prenatal care)

The Kotelchuck Index, also known as **Adequacy of Prenatal Care Index (APNCU)**, is a two-factor index that utilizes two independent and distinct dimensions: Adequacy of Initiation of Prenatal Care and Adequacy of Received Services. The month in which care is initiated is grouped not by trimester, but into four adequacy groupings. The expected number of visits is based on the ACOG standard and is shown as the ratio of actual visits to recommended number of visits.

Kotelchuck Index measurements:

Adequate Plus: Prenatal care begun by the 4th month and 110% or more of recommended prenatal visits were received.
Adequate prenatal care: Prenatal care begun by the 4th month and 80% - 109% of recommended prenatal visits were received.
Intermediate prenatal care: Prenatal care begun by the 4th month and 50% to 79% of recommended prenatal visits were received.
Inadequate prenatal care: Prenatal care begun after the 4th month or less than 50% of recommended prenatal visits were received.

The index uses information readily available on the standard U.S. birth certificates (number of prenatal care visits, month prenatal care began, and gestational length of pregnancy).

Leisure-time physical activity	Activities such as running, walking, golf, gardening, etc., done during leisure time.
Life expectancy	A hypothetical calculation of the average age at death for a cohort of persons subject to the age-specific mortality rates observed over a given time period.
Lupus	A chronic inflammatory condition caused by an autoimmune disease occurring when the body's tissues are attacked by its own immune system.
Lyme Disease	A systemic, tick-borne disease with a number of manifestations, including dermatologic, rheumatologic (arthritic), neurologic and cardiac abnormalities. The best clinical marker for the disease is the initial skin lesion, erythema migrans, (EM), that occurs in 60-80% of patients. The disease is treated with commonly available antibiotics.
MMR Vaccine	**Measles**-**Mumps**-**Rubella** (see individual definitions within glossary).
Medical Home	An approach to providing healthcare services in a high-quality and cost-effective manner. Those who have a medical home receive the care that they need from a pediatrician or physician whom they know and trust. The pediatric healthcare professionals and parents act as partners in a medical home to identify and access all the medical and non-medical services needed to help children and their families achieve their maximum potential.
Measles	An acute and highly contagious viral disease characterized by fever, runny nose, cough, red eyes, and a spreading skin rash.
Medically Underserved Area (MUA)	The federal government designates some areas of the country as "medically underserved." These areas, known as health professional shortage areas (HPSAs), have fewer than a generally accepted minimum number of clinicians (physicians, dentists, mental health workers, etc.) per thousand population. Many of the people in these areas experience limited access to primary care services due to financial, cultural, language, or other barriers.
Meningitis	Inflammation of the meninges (in the brain), usually due to a bacterial infection but sometimes from viral, protozoan, or other causes.
Mental Disorders	Health conditions characterized by alterations in thinking, mood, or behavior (or some combination) associated with distress and/or impaired functioning. Defined as any disorder coded in the Diagnostic and Statistical Manual for Mental Disorders, III, Revised (DSM-III-R).
Metastasize	To spread from one part of the body to another. In terms of cancer, to travel from the original cancer site
Methicillin-resistant	Per U.S. Census Bureau, this area must have at least one urbanized area of 50,000 or more inhabitants.
Michigan Injury Prevention Plan	Developed by the Michigan Injury Prevention Task Force, this draft strategic plan contains recommendations to build the core capacity of the state injury program as well as impact the top four priority causes of injury in Michigan.
Modalities	A therapeutic method or agent, such as surgery, chemotherapy, or electrotherapy,

	which involves the physical treatment of a disorder.
Moderate physical activity	Activities that cause small increases in breathing or heart rate including brisk walking, bicycling, vacuuming or gardening.
Monkeypox	A viral disease of people, monkeys and some rodents, caused by the monkeypox virus. Infected people exhibit a characteristic rash that resembles smallpox.
Morbidity	A departure from a state of physiological or psychological well-being. The term *Morbidity Rate* should not be used. Instead see *Prevalence Rate* or *Incidence Rate.*
Mortality	The whole sum or number of deaths in a given time or a given community; also, the proportion of deaths to population, or to a specific number of the population; death rate.
Mumps	An acute contagious disease caused by a paramyxovirus (genus *Rubulavirus*) and marked by fever and by swelling especially of the parotid gland -- called also *epidemic parotitis.*
NHANES (**N**ational **H**ealth **A**nd **N**utrition **E**xamination) Survey	Conducted by the National Center for Health Statistics, Centers for Disease Control (NCHS/CDC) designed to assess the health and nutritional status of adults and children in the United States through interviews and direct physical examinations.
Necrotizing enterocolitis	An infectious inflammatory disease of premature newborns; intestinal atresia, failure of development of part of the intestine; and volvulus, which occurs when the bowel gets twisted and the blood supply is impaired.
Non-aggravated assault	An unlawful physical attack by one person upon another, where no weapon is present and no severe injury occurs.
Non-clinical centers	Teen health centers that focus on case finding, screening, and referral for primary care and health education services and do not provide primary health services.
Obesity	Refers specifically to having an abnormally high proportion of body fat or having a body mass index (BMI) of greater than or equal to 30.
Overweight	Refers to an excess of body weight compared to set standards or having a body mass index (BMI) greater than 25 but less than 30. A person can be overweight without being obese. However, many people who are overweight are also obese.
Peak flow meter	Device that measures the maximum rate of airflow out of the lungs during forced expiration and that is used especially for monitoring lung capacity of individuals with asthma (as to indicate bronchial narrowing).
Per Capita Personal Income	The total person income divided by the total mid-year population.
Perinatal period	Period from birth to within the first seven days of life
Person-Time	A measurement combining persons and time, used as a denominator in person-time rates. It is the sum of individual units of time during which the persons in a study or population group of interest have been exposed to or subject to a condition of interest. Usually expressed as Person-Years. For example, 100 persons exposed to a condition for 10 years would add up to 1,000 person-years.

Person –years of life lost	The sum of the difference between the actual age at death and the expected remaining lifetime for each person who died.
Pertussis (Whooping Cough)	An infectious disease, especially of children, marked by a convulsive spasmodic cough sometimes followed by a crowing intake of breath.
Polio	Acute infectious viral disease caused by the poliovirus, characterized by fever, motor paralysis, and atrophy of skeletal muscles often with permanent disability and deformity, and marked by inflammation of nerve cells in the ventral horns of the spinal cord.
Polycystic Kidney Disease	A hereditary disease that is present at birth and causes many cysts in the kidney. There are two forms of polycystic kidney disease: one that runs through families, and one that is more rare and mostly occurs without prior family history of polycystic disease.
Postnatal	Occurring or existing after birth.
PRAMS	The **P**regnancy **R**isk **A**ssessment **M**onitoring **S**ystem is a surveillance project of the Center for Disease Control and Prevention (CDC) and state health departments. PRAMS collects state-specific, population-based data on maternal attitudes and experiences prior to, during, and immediately following pregnancy among a sample of women who have recently given birth to a live infant.
Pre-eclampsia	A condition in pregnancy characterized by abrupt hypertension (a sharp rise in blood pressure), albuminuria (leakage of large amounts of the protein albumin into the urine) and edema (swelling) of the hands, feet, and face.
Prevalence	The number of instances of a given illness or condition in a given population at a designated time; sometimes referred to as *prevalence rate*. The term usually refers to the situation at a specific point in time. Compare *Incidence Rate*.
Prion mediated	Occurring via prions. (Prions: an unconventional transmissible agent. Currently the most accepted theory is that the agent is a modified form of a normal cell surface component known as a prion protein).
Private-waged or salaried worker	Class of worker that includes private for profit and private not-for-profit organizations, self-employed in own incorporated business.
Prostate Specific Antigen (PSA)	A blood test that can indicate diseases of the prostate and used as follow up for possible recurrence of prostate cancer after treatment. It may be used to screen for prostate cancer to detect cancer at an earlier stage than would be detected by symptoms; use as a screening tool is controversial.
Quarantinable	Enforced isolation or restriction of free movement imposed to prevent the spread of contagious disease.
Quinolone-resistant	See Antibiotic-resistant organism.
Quinolone-resistant gonorrhea (QRNG)	Strain of gonorrhea that is not susceptible to fluoroquinolones, a class of antibiotic that includes ciprofloxacin and ofloxacin.
RAND	To gain a better understanding of which fall prevention interventions may be beneficial in the Medicare population, the Centers for Medicare and Medicaid Services (CMS), as part of its Healthy Aging Project, commissioned an evidence-

based systematic review of interventions in the prevention of falls, the results of which are detailed in the RAND report.

Rape	For State Police data, this is carnal knowledge of a person, forcibly and against that person's will, or where the victim is incapable of giving consent because of his/her temporary or permanent mental or physical incapacity. Rape includes assault to rape and attempted rape. Only those offenses where the victim and offender are of the opposite sex; other types of sexual penetration are not included. Counted offenses are the only unlawful acts reported to a law enforcement agency.
Rate	A measure of the frequency of occurrence of a phenomenon. In health statistics, a rate is an expression of the frequency with which an event occurs in a defined population in a specified period of time.
Rheumatic conditions	Condition where abnormalities in the immune system cause inflammation in joints.
Rubella	An acute contagious disease that is milder than typical measles but is damaging to the fetus when occurring early in pregnancy and that is caused by a togavirus - also called German Measles
Salmonellosis	Disease caused by infection with a species of salmonella. In people it is most often manifested as food poisoning with symptoms of vomiting, diarrhea, and fever.
School-linked/based health centers (SLBHC)	Primary care centers serving the adolescent populations that are located in a community setting (i.e. not directly located on school property). SLBHC must be accessible to adolescents in the community and should either be in walking distance from surrounding schools or on a bus route. Preventive health services provided for students – excluding college and university students.
Scleroderma	A disease of connective tissue with the formation of scar tissue (fibrosis) in the skin and sometimes also in other organs of the body.
Serostatus	The results of a blood test for specific antibodies. In this report, it is in reference to antibodies to HIV.
Smallpox	An acute, highly infectious, often fatal disease caused by a pox virus and characterized by high fever and aches with subsequent widespread eruption of pimples that blister, produce pus, and form pockmarks.
Sigmoidoscopy	An exam where a doctor looks inside the rectum and lower half of the colon through a lighted tube.
Subarachnoid hemorrhage	See hemorrhagic stroke
Sudden Infant Death Syndrome	The sudden, unexpected death of an apparently healthy infant under one year of age, usually occurring during sleep, which remains unexplained after a thorough autopsy, death scene investigation and a review of the medical history.
Teenage birth rate	Number of resident live births to teens of a specific age group (most often 15-19 or 15-17) divided by total resident female population of that age group x 1,000.
Teenage pregnancy rate	The sum of live births, abortions and estimated miscarriages divided by total resident female teen population of a specific age, then multiplied by 1,000 to generate the rate per 1,000.

Tetanus	An acute infectious disease, also known as Lockjaw, characterized by tonic spasm of voluntary muscles and especially of the muscles of the jaw and caused by the specific toxin, which is usually introduced through a wound.
Thrombolitic stroke	A type of ischemic stroke that accounts for 40 percent to 50 percent of all cases of stroke where a blood clot forms in one of the brain's arteries, blocking blood flow to the brain. In most cases, the artery was already narrowed as a result of atherosclerosis (fatty build-up).
Unserved (individual)	Those individuals receiving no medical care.
Vancomycin-resistant	See Antibiotic-resistant organism.
Varicella (Chicken pox)	An acute contagious disease especially of children that is marked by low-grade fever and formation of vesicles and that is caused by a herpes virus.
Vigorous physical activity	Activities that cause a large increase in breathing or heart rate. Examples include running, aerobics and heavy yard work.
Virulent	Extremely infectious, malignant, or poisonous.
WIC (Women, Infants and Children) Program	Special Supplemental Nutrition Program funded by the U.S. Department of Agriculture providing nutritious foods, nutrition counseling, and referrals to health and other social services to participants at no charge. WIC serves low-income pregnant, postpartum and breastfeeding women and infants and children up to age 5 who are at nutrition risk.
Years of Potential Life Lost (YPLL)	A measure of the relative impact of various diseases and lethal forces on society. It highlights the loss to society as a result of early or premature deaths. The estimate for YPLL due to a particular cause is the sum, over all persons dying from that cause, of the years that these persons would have lived had they reached a specified age (usually denoted as 75 years of age).
Youth Risk Behavior Survey (YRBS)	A survey developed by the Centers for Disease Control and Prevention (CDC) to track the extent of health-risk behaviors among the nation's youth. The survey was launched in 1990 and has been implemented every other year since 1991. A majority of the states, including Michigan, and some cities, conduct a YBRS based on the national survey.

Reliability of Rates

Care should be taken in drawing specific inferences from comparisons of rates for different areas or different periods of time. Rates based on a small number of events or for a small area tend to exhibit considerable variation from time period to time period or place to place. Excessive variation in rates not only negates their utility as estimators of the probability of an event occurring but also their usefulness for comparative purposes.

Also, one should recognize the limitations of using unadjusted rates in attempting to attribute rate differences to particular factors.

Many times there are simply not sufficient data available to adequately adjust rates for all possible confounding factors. For this reason the reader should exercise diligence and caution while attempting to draw substantive conclusions when comparing vital statistics rates.

International Classification of Diseases – Tenth Revision
- ICD-10 Codes –

Disease	ICD-10 Codes
Breast Cancer	C50-.9
Cervical Cancer	C53 –.9
Colorectal Cancer	C18-C20
Heart Disease	I00-I09, I11, I13, I20-I51
Stroke	I60-I69
Diabetes	E10-E14
Kidney Disease	N00-N07, N17-N19, N25-N27
Asthma	J45-J46
Chronic Lower Respiratory Disease	J40-J47
Alcohol Dependency and Poisoning	F10.2, K70.3, R78.0, X40, 41,44,48-49, T51.0, Y10, 11,13,14,19.
Drug Dependency and Poisoning	F11.2, F12.2, F13.2, F14.2, F15.2, F16.2, F18.2, F19.2
Suicide	X60-X84,Y87.0
Sudden Infant Death Syndrome (SIDS)	R95
Motor Vehicle Accidents (MVA)	V02–V04, V09.0, V09.2, V12–V14, V19.0–V19.2, V19.4-V19.6, V20-V79, V80.3-V80.5, V81.0-V81.1, V82.0-V82.1, V83-V86, V87.0-V87.8, V88.0-V88.8, V89.0, V89.2
Falls	W00-W19
Poisoning	X40-X49
Unintentional Injuries	V01-X59,Y85-Y86
Homicide	X85-Y09,Y87.1
Tuberculosis	A16 – A19
HIV/AIDS	B20-B24

To learn more about International Classification of Diseases, Tenth Revision (ICD-10) codes, please visit http://www.cdc.gov/nchs/about/major/dvs/icd10des.htm `