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## INTRODUCTION

Ottawa County is located in the southwestern section of Michigan's Lower Peninsula. Its western boundary is formed by Lake Michigan and its eastern boundary is approximately 30 miles inland. The county is 174 miles west of Detroit and 150 miles northeast of Chicago. Ottawa County was originally settled by Dutch immigrants and today 45% of the population claim Dutch ancestry. Persons of German ancestry are the next largest group, comprising 26% of the population.

The Ottawa County Community Health Profile provides a snapshot of the health status of Ottawa County, Michigan residents. The indicators reported in this document directly or indirectly measure the health of the residents. Steps taken to improve the health status of any community will only be successful if there is a clear recognition and understanding of the major health problems confronting the community

The data presented here was compiled from a variety of sources provided by state and federal reports. This report has been developed to assist individuals, groups and agencies working to understand and improve the health of Ottawa County residents. The report will aid in identifying and analyzing the factors which represent or influence the health status of the community.

At times, the analysis focuses on one year of health data. When available, data from additional years has been included to examine potential trends and verify observed differences among various population groups. External comparisons, such as those between one community and another, can be used to evaluate the relative importance of a piece of information. Internal comparisons, such as subgroup analyses of age, gender or race, can be used to recognize disparities and find significant health problems masked by the analysis of the whole population.

The results of these analyses are meant to serve as baselines against which the findings of future periodic assessments can be gauged. Assessment in the future will not only be necessary to provide insight into changing health patterns, but also to establish a method for monitoring improvement. Overall, the report supports policy making and program planning by stressing the importance of using outcome indicators to measure health status improvement.

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## OTTAWA COUNTY HEALTH INDICATORS: FIVE OR TEN YEAR TREND DIRECTION

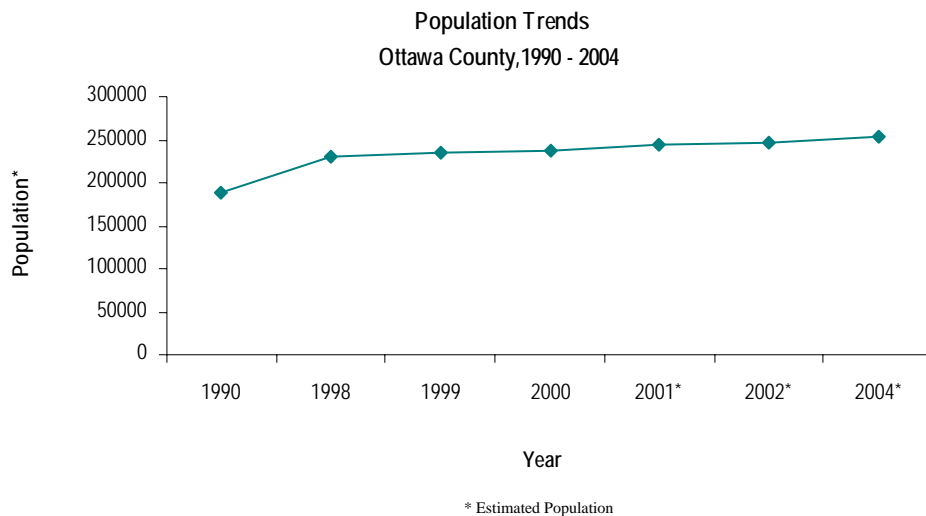
|                                          | Right<br>Direction | Wrong<br>Direction | No<br>Significant<br>Change | No Data<br>Available |
|------------------------------------------|--------------------|--------------------|-----------------------------|----------------------|
| <b>ACCESS TO HEALTHCARE SERVICES</b>     |                    |                    |                             |                      |
| General Health was Fair or Poor          |                    | ✓                  |                             |                      |
| No Health Insurance Coverage             |                    | ✓                  |                             |                      |
| Difficulty Accessing Services            |                    |                    |                             | ✓                    |
| Health System Capacity                   |                    |                    |                             | ✓                    |
| <b>MORTALITY</b>                         |                    |                    |                             |                      |
| Death Rates                              |                    |                    | ✓                           |                      |
| Leading Causes of Death:                 |                    |                    |                             |                      |
| Heart Disease Mortality                  | ✓                  |                    |                             |                      |
| Cancer Mortality                         | ✓                  |                    |                             |                      |
| Stroke Mortality                         | ✓                  |                    |                             |                      |
| Accident Mortality                       | ✓                  |                    |                             |                      |
| Premature Mortality                      |                    |                    |                             | ✓                    |
| <b>MORBIDITY</b>                         |                    |                    |                             |                      |
| Preventable Hospitalization              |                    |                    | ✓                           |                      |
| Cancer Surveillance:                     |                    |                    |                             |                      |
| Breast Cancer Diagnosis                  |                    | ✓                  |                             |                      |
| Colorectal Cancer Diagnosis              | ✓                  |                    |                             |                      |
| Lung Cancer Diagnosis                    |                    | ✓                  |                             |                      |
| Prostate Cancer Diagnosis                | ✓                  |                    |                             |                      |
| Communicable Disease Surveillance:       |                    |                    |                             |                      |
| Hepatitis C                              | ✓                  |                    |                             |                      |
| Chickenpox                               | ✓                  |                    |                             |                      |
| Giardiasis                               | ✓                  |                    |                             |                      |
| Meningitis                               | ✓                  |                    |                             |                      |
| Chlamydia                                |                    | ✓                  |                             |                      |
| <b>MATERNAL, INFANT AND CHILD HEALTH</b> |                    |                    |                             |                      |
| Birth Outcomes:                          |                    |                    |                             |                      |
| Infant Mortality                         | ✓                  |                    |                             |                      |
| Neonatal mortality                       |                    | ✓                  |                             |                      |
| Postnatal mortality                      | ✓                  |                    |                             |                      |
| Low Birth Weight                         |                    | ✓                  |                             |                      |
| Very Low Birth Weight                    |                    | ✓                  |                             |                      |
| Maternal Characteristics:                |                    |                    |                             |                      |
| Late or No Prenatal Care                 | ✓                  |                    |                             |                      |
| Smoked While Pregnant                    | ✓                  |                    |                             |                      |
| Birth to Teens Under 20 Years            | ✓                  |                    |                             |                      |
| Family Planning:                         |                    |                    |                             |                      |
| Teen Pregnancy                           | ✓                  |                    |                             |                      |
| Birth to Unwed Mothers                   |                    | ✓                  |                             |                      |
| Abortion                                 |                    | ✓                  |                             |                      |

|                                         | Right<br>Direction | Wrong<br>Direction | No<br>Significant<br>Change | No Data<br>Available |
|-----------------------------------------|--------------------|--------------------|-----------------------------|----------------------|
| <b>MODIFIABLE RISK FACTORS</b>          |                    |                    |                             |                      |
| Nutrition and Overweight:               |                    |                    |                             |                      |
| Fruits & Vegetables < 5 Times a Day     |                    | ✓                  |                             |                      |
| Obesity                                 |                    | ✓                  |                             |                      |
| Overweight                              | ✓                  |                    |                             |                      |
| Physical Activity in Leisure Time       | ✓                  |                    |                             |                      |
| Substance Abuse:                        |                    |                    |                             |                      |
| Heavy Drinking                          |                    | ✓                  |                             |                      |
| Binge Drinking                          |                    | ✓                  |                             |                      |
| Liver Disease Mortality                 |                    | ✓                  |                             |                      |
| Tobacco Use (Current Cigarette Smokers) |                    | ✓                  |                             |                      |
| Health Screenings:                      |                    |                    |                             |                      |
| Ever Check Cholesterol                  |                    |                    | ✓                           |                      |
| Influenza Shots                         |                    |                    |                             | ✓                    |
| Ever Had a Colonoscopy                  |                    | ✓                  |                             |                      |
| Ever Had a Pap Exam                     |                    |                    | ✓                           |                      |
| Ever Been to a Dentist                  |                    |                    |                             | ✓                    |
| 19-25 Month Immunizations               | ✓                  |                    |                             |                      |
| Cardiovascular Diseases Risk Factors:   |                    |                    |                             |                      |
| High Cholesterol                        |                    |                    | ✓                           |                      |
| High Blood Pressure                     |                    |                    | ✓                           |                      |
| Diabetes                                |                    | ✓                  |                             |                      |
| Responsible Sexual Behavior:            |                    |                    |                             |                      |
| HIV/AIDS Prevalence                     |                    | ✓                  |                             |                      |
| Incidence of Chlamydia                  |                    | ✓                  |                             |                      |
| Incidence of Gonorrhea                  | ✓                  |                    |                             |                      |
| Incidence of Syphilis                   | ✓                  |                    |                             |                      |
| <b>ENVIRONMENTAL HEALTH</b>             |                    |                    |                             |                      |
| Air Quality                             | ✓                  |                    |                             |                      |
| Food Safety                             | ✓                  |                    |                             |                      |
| Lead Exposure                           |                    |                    |                             | ✓                    |
| <b>SOCIAL AND MENTAL HEALTH</b>         |                    |                    |                             |                      |
| Abuse:                                  |                    |                    |                             |                      |
| Child Victims of Abuse                  |                    |                    | ✓                           |                      |
| Rape Offenses                           |                    | ✓                  |                             |                      |
| Violence and Injury:                    |                    |                    |                             |                      |
| Fatal Crashes                           | ✓                  |                    |                             |                      |
| Domestic Violence                       |                    | ✓                  |                             |                      |
| Suicide Mortality                       |                    | ✓                  |                             |                      |
| Underage Drinker in Car Crashes         | ✓                  |                    |                             |                      |

## DEMOGRAPHIC CHARACTERISTICS

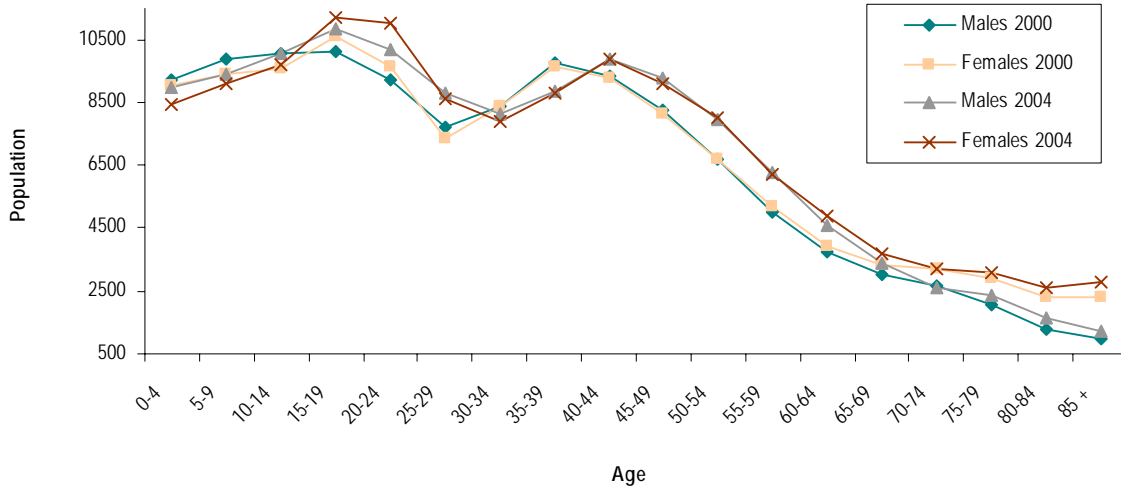
According to the Census 2000, Ottawa County had a population of 238,314 with a density of 412.3 persons per square mile. Based on 2000 to 2004 population estimates, Ottawa County was ranked the eighth most populous county in Michigan, accounting for approximately 2.5% of the state's population. In Ottawa County, the population of females was higher than males by 1.6%. The county was predominantly occupied by individuals within the age range of 25 to 54 years old, who accounted for 41.8% of the population. Ottawa County's racial distribution was predominantly white with other races accounting for only 7% of the population.

### Population Trends



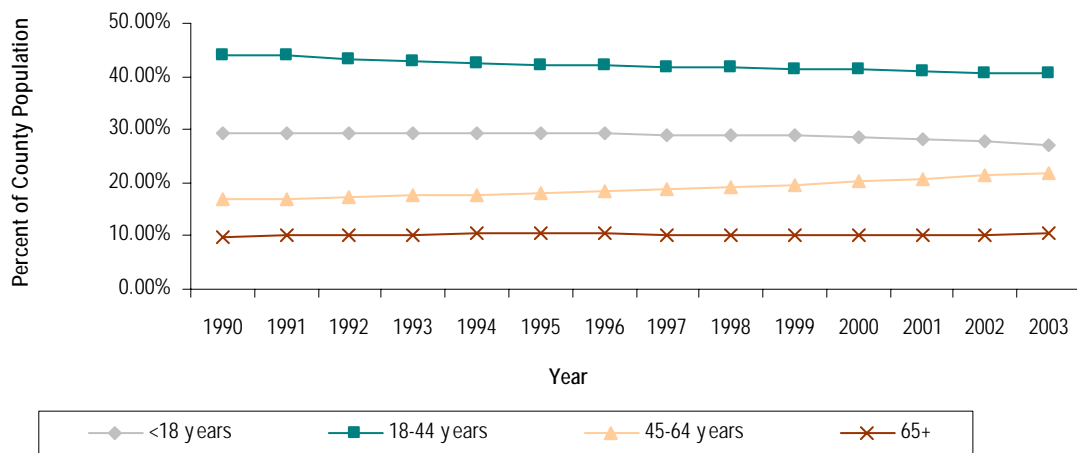
- ✓ Between 1990 and 2000, the population of Ottawa County increased by approximately 21.2% (from 187,768 in 1990 to 238,314 in 2000). Population estimates indicated an additional 5% increase from 2000 to 2004 (252,351).
- ✓ In comparison to the state of Michigan, Ottawa County experienced a relatively large population increase. The state had a 6.9% increase from 1990 to 2000.

Population Distribution Estimates by Age and Gender  
Ottawa County, 2000 and 2004



- ✓ The median age in Ottawa County in 2000 was 32.3 years.
- ✓ In 2000, 50.8% of the population was female, while 49.2% was male. Population analysis indicated an increasing trend for both sexes. In 2000, there were 117,349 male and 120,965 females while in 2004, there were 124,324 males and 128,028 females.
- ✓ Children under the age of 5 years old accounted for 7.7% of the county's population in 2000.

Percent of Population by Age Groups  
Ottawa County, 1990-2003





- ✓ Approximately 33% of the county's population was under 20 years of age.
- ✓ Population trends from 1990 to 2003 indicate a slight decrease in the percent of individuals less than 18 years old.
- ✓ An estimated 3% decrease in population was observed for individuals 18 to 44 years from 1990 to 2003. An increasing trend was observed for individuals aged 45 to 64 years, increasing 5% from 1990 to 2003.
- ✓ Those 65 years and older accounted for 10% of the county's population. There was a small increase (0.6%) observed for this population from 1990 to 2003.
- ✓ Individuals 20 to 64 years made up 57.2% of the population.

## Race and Language

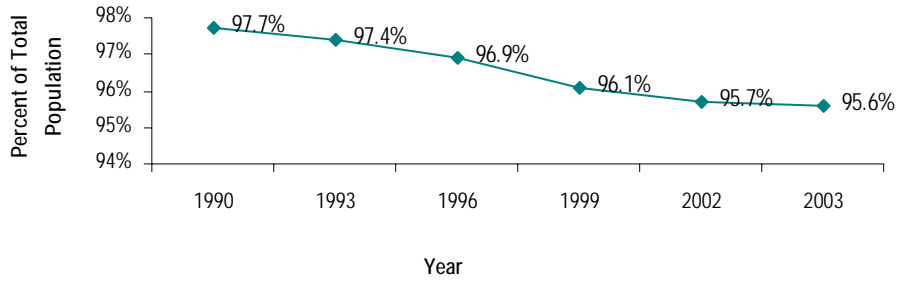
Population Distribution by Race  
Ottawa County, 2000

| Race                            | Number  | Percent of Total Population |
|---------------------------------|---------|-----------------------------|
| White                           | 218,105 | 91.5                        |
| Asian                           | 4,991   | 2.1                         |
| Black                           | 2,497   | 1.0                         |
| American Indian & Alaska Native | 851     | 0.4                         |
| Hawaiian & Pacific Islander     | 45      | 0.01                        |
| Some Other Race                 | 8,295   | 3.5                         |
| Two or more races               | 3,530   | 1.5                         |
| Total Population                | 238,314 | 100.0                       |

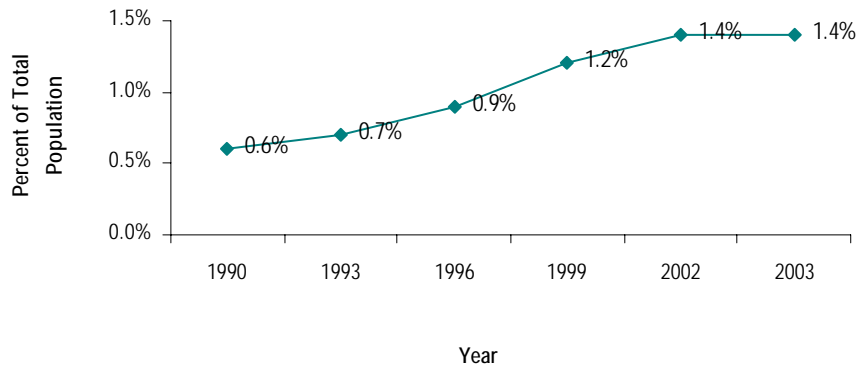
| Hispanic or Latino and Race   | Number  | Percent of Total Population |
|-------------------------------|---------|-----------------------------|
| Hispanic or Latino (any race) | 16,692  | 7.0                         |
| Non Hispanic or Latino        | 221,622 | 93                          |
| Total Population              | 238,314 | 100.0                       |

- ✓ Ottawa County was predominantly White (91.5%), seconded by the Asian race (2.1%).
- ✓ Individuals of Hispanic or Latino decent of any race made up 7% of the total population. Of this population, an estimated 75% were of Mexican decent, seconded by Puerto Rican with 4.2%.
- ✓ The population analysis for race from 1990 to 2003 indicated an increasing trend for the following races and ethnicities: Black, Asian, Pacific Islander and individuals of Hispanic or Latino origin.
- ✓ A decreasing trend was observed for the White race from 1990 to 2003.
- ✓ With respect to the Native American race, there was a slight increase between 1998 and 1999. In subsequent years the population estimate has remained stable for this race.
- ✓ According to the Census 2000, 91.1% (200,820) of Ottawa County residents (population five years and older) spoke English; 8.9% (19,513) spoke a language other than English. The greatest population of those who spoke a language other than English spoke Spanish (5.4%).

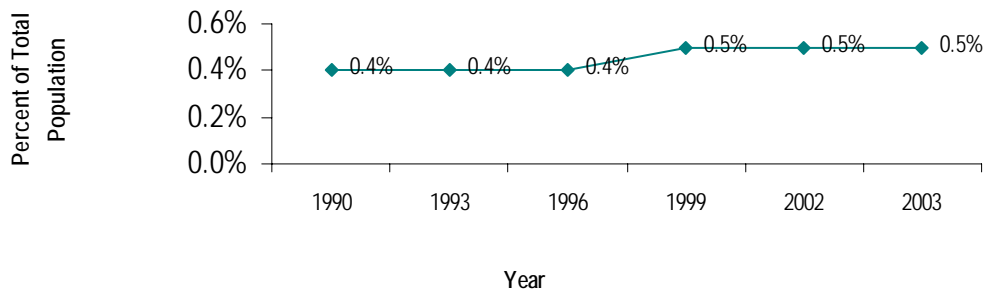
Percent of Population by White Race  
Ottawa County, 1990-2003



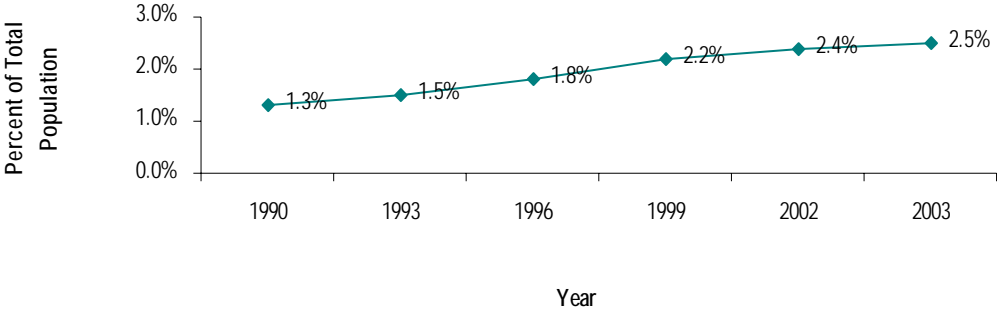
Percent of County Population by Black Race  
Ottawa County, 1990-2003



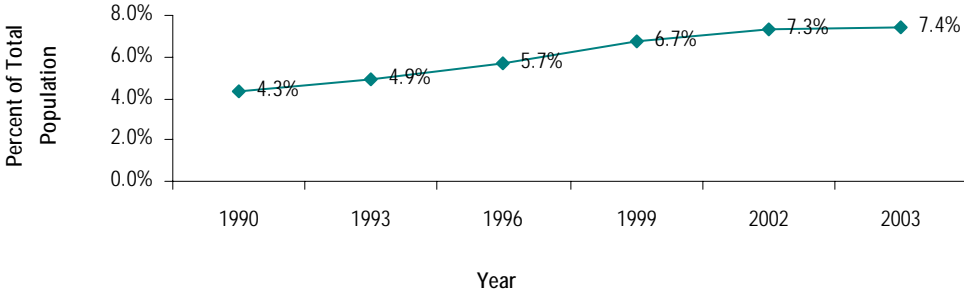
Percent of County Population by Native American Race  
Ottawa County, 1990-2003



Percent of County Population by  
Asian & Pacific Islander Race  
Ottawa County, 1990-2003



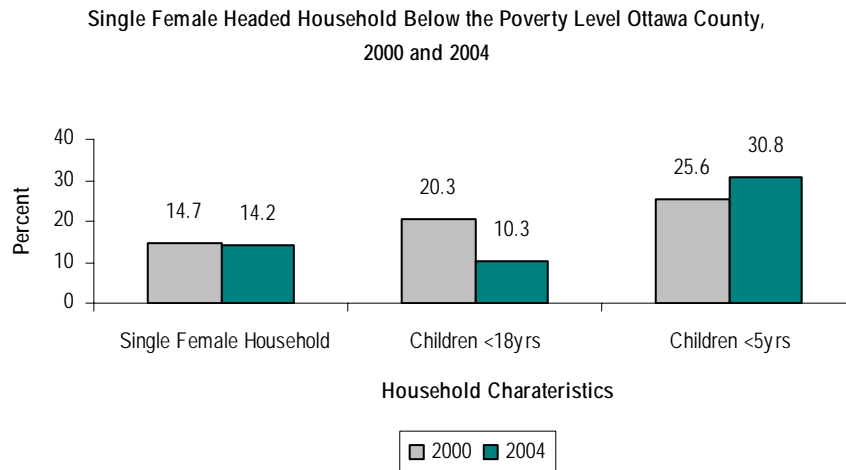
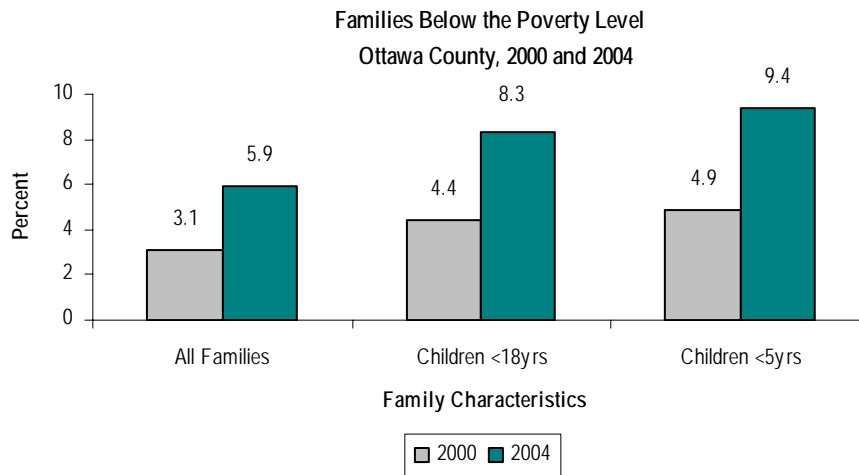
Percent of County Population by Hispanic Origin  
Ottawa County, 1990-2003



## SOCIOECONOMIC CHARACTERISTICS

Certain socioeconomic factors such as income, education and employment are associated with health status and health outcomes. As such, these factors are considered important indicators of a community's overall health status.

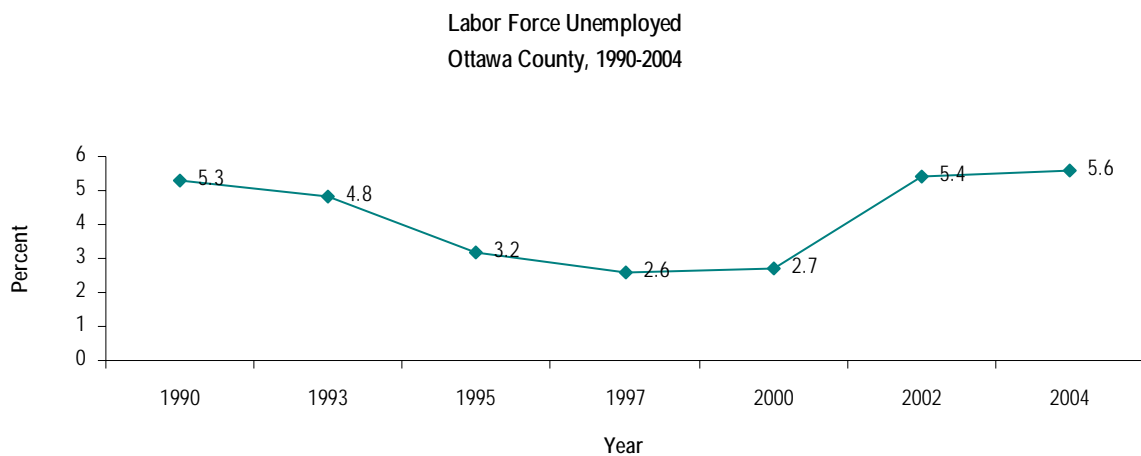
### Poverty



- ✓ According to the American Community Survey conducted by the Census Bureau in 2004, Ottawa County ranked 190<sup>th</sup> out of 236 counties in the United States with 7.2 % of the people living below poverty level in the past year. A rank of 1 means a county had the lowest poverty rate compared to other counties in the nation.

- ✓ There has been an increase in the number of individuals with incomes below poverty level. In 2000, 5.5% of individuals in Ottawa County had incomes below the poverty level compared to 7.2% in 2004.
- ✓ In 2000, 5.1% of individuals under 18 years old had incomes below the poverty level compared to 8.7% in 2004.
- ✓ In 2000, 4.9% of individuals 65 years of age and older had incomes below the poverty level compared to 6.7% in 2004.
- ✓ In 2000, 34% of the total births were enrolled into the WIC program and 26% of the total births were enrolled into Medicaid. The proportion of WIC and Medicaid enrollment has not changed since 1998.
- ✓ According to Michigan Kids Count, the percentage of children in Ottawa County enrolled in the free and reduced-priced school lunch program has increased by 11% from 1990 to 2003. Ottawa County is below the state by 11.9%.
- ✓ According to Michigan Kids Count, Ottawa County was ranked second and third among 83 counties for kids age 0 to 18 receiving food stamps and Family Independence Program assistance respectively in 2002. A rank of 1 means a county had the lowest rate of food stamp assistance compared to other counties in the state.

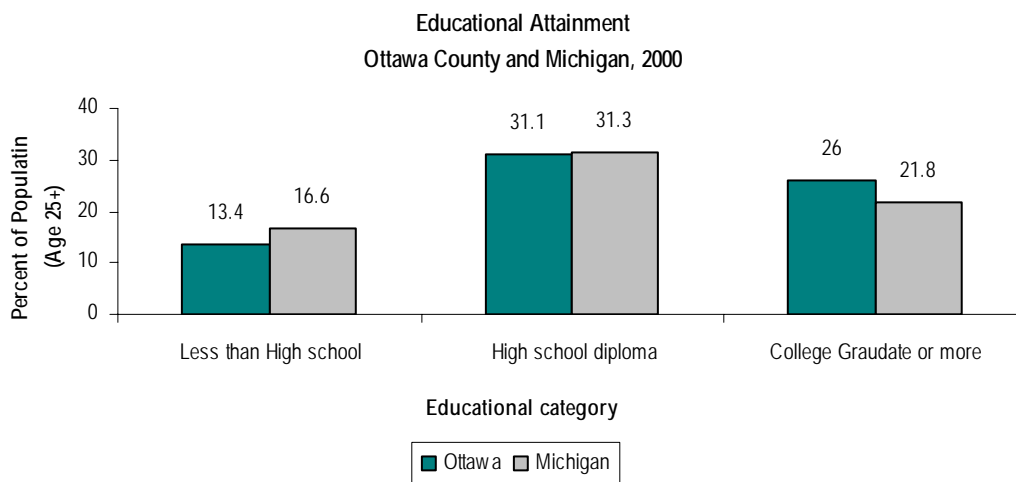
## Income and Employment



- ✓ According to the American Community Survey done by the Census Bureau in 2004, Ottawa County ranked 78<sup>th</sup> out of 236 counties in the United States with household median income \$54,526, this is \$33,607 below the highest ranked county (Fairfax County, Virginia \$88,133). A rank of 1 means a county had the best highest median income compared to other counties in the nation.
- ✓ The median household income for Ottawa County was \$52,347 in 2000, which was higher than the median household income for Michigan by \$7,680.

- ✓ The median household income in Ottawa County has increased by \$2,179 from 2000 to 2004.
- ✓ The unemployment trend in Ottawa County indicated an increase in the percentage of the labor force unemployed. The county observed a 2.7% decline in the percentage of labor force unemployed between 1990 and 1997. Between 1997 and 2004 unemployment rose by 3% in Ottawa County.
- ✓ In 2000, the Ottawa County age population with the highest unemployment in labor force was the age group 20 to 24 years with 6.0% seconded by age group 16 to 19 years with 5.2%. The age group 60 to 64 years had the least unemployment with 1.2%.
- ✓ In 2000, management, professional and related occupations accounted for the highest percentage (31.2%) of the employed civilian occupation in Ottawa County seconded by sales with 23.7%. Construction had the least representation in the unemployed population with 8.3%. A similar pattern was observed for 2004 occupations.

## Education



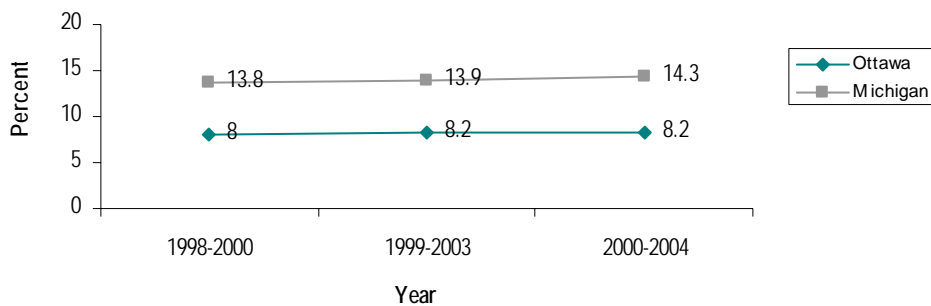
- ✓ Ottawa County residents were more educated than their state counterparts; in Michigan 16.6% of the population had less than a high school education as compared to 13.4% of Ottawa County's population.
- ✓ Likewise 26.0% of the county's population had a college degree while 21.8% of the state population graduated from college.
- ✓ Ottawa ranked 150<sup>th</sup> among 236 counties in the United States for persons age 25 and over with a college degree in 2004. A rank of 1 means a county had the highest rate of college graduates compared to other counties in the nation.
- ✓ According to the Census 2000, 85.3% of the county's 16 to 19 years old were enrolled in school and 14.7% were not. Of the 14.7% not enrolled in school, 8.9% of them were high school graduates and 5.8% were not high school graduates.

## ACCESS TO HEALTHCARE SERVICES

Access to healthcare refers to the ease with which people can obtain the care they need in a timely fashion. Timely access to quality care is important to eliminate health disparities and increase the quality and years of life. Adequate access to health care involves timely screening for disease, receiving treatment for illness and injury, avoiding preventable hospitalizations and adopting healthier lifestyles. Some of the factors that influence whether appropriate and timely health care is obtained include health service availability, health care coverage, cost of care and transportation.

### General Health

Reported that Their Health was Fair or Poor  
Ottawa County and Michigan, 1998-2004



Perceived Health Status by Age and Gender  
Ottawa County, 1999 to 2004

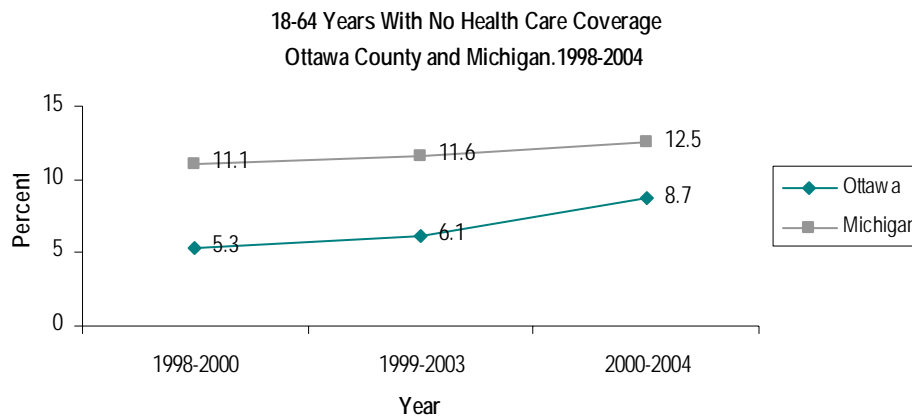
|                  | 1999<br>Excellent/Good (%) | 1999<br>Fair/Poor (%) | 2004<br>Excellent/Good (%) | 2004<br>Fair/Poor (%) |
|------------------|----------------------------|-----------------------|----------------------------|-----------------------|
| <b>Total</b>     | 93.9                       | 7                     | 88.4                       | 11.6                  |
| <b>Male</b>      | 94.7                       | 5.3                   | 88.7                       | 11.3                  |
| <b>Female</b>    | 91.4                       | 8.6                   | 88.1                       | 11.9                  |
| <b>18-24 yrs</b> | 95.9                       | 4.1                   | 93.1                       | 6.9                   |
| <b>25-34 yrs</b> | 96.1                       | 3.9                   | 97.5                       | 2.5                   |
| <b>35-44 yrs</b> | 97                         | 3                     | 92.4                       | 7.6                   |
| <b>45-54 yrs</b> | 90.4                       | 9.6                   | 84.9                       | 15.1                  |
| <b>55-64 yrs</b> | 92.3                       | 7.7                   | 84                         | 16                    |
| <b>65-74 yrs</b> | 88.5                       | 11.5                  | 84.3                       | 15.7                  |
| <b>75 yrs +</b>  | 73.8                       | 26.2                  | 66.1                       | 33.9                  |

- ✓ From 1998 to 2004, the trend for Michigan and Ottawa County indicated a slight increase for the proportion of respondents who reported that their health in general

was fair or poor. The proportion of respondents who reported fair or poor health was higher in Michigan than in Ottawa County over the same time period.

- ✓ According to the Ottawa County 2004 Behavioral Risk Factor Survey (BRFS), an estimated 11% of respondents indicated that, in general, their health was fair/poor compared to 7.0% in 1999.
- ✓ BRFS respondents age 75 years and older (33.9%) were more likely to report fair/poor health than those between the ages of 35 to 44 years old (7.6%).
- ✓ Respondents who report not graduating from high school (26.2%) were more likely to report fair/poor health than those with some college, an associate or bachelor degree (10.5%).

## Health Insurance Coverage



- ✓ From 1998 to 2004, the trend for Michigan and Ottawa County indicated an increase for the proportion of respondents who reported that they do not have any kind of health care coverage. The proportion of respondents who reported no health insurance coverage was higher in Michigan than in Ottawa County over the same time period.



**No Health Care Coverage by Age, Gender and Education  
Ottawa County, 1999-2004**

|                                                     | 1999<br>No Health Coverage (%) | 2004<br>No Health Coverage (%) |
|-----------------------------------------------------|--------------------------------|--------------------------------|
| <b>Total</b>                                        | 6.1                            | 8.9                            |
| <b>Male</b>                                         | 6.1                            | 11.0                           |
| <b>Female</b>                                       | 6.1                            | 2.9                            |
| <b>18-24 yrs</b>                                    | 9.1                            | 13.8                           |
| <b>25-34 yrs</b>                                    | 5.7                            | 13.5                           |
| <b>35-44 yrs</b>                                    | 4.7                            | 9.1                            |
| <b>45-54 yrs</b>                                    | 5.2                            | 6.3                            |
| <b>55-64 yrs</b>                                    | 6.7                            | 8.5                            |
| <b>65-74 yrs</b>                                    | 1.6                            | 1.4                            |
| <b>75 yrs +</b>                                     | 2.4                            | 6.8                            |
| <b>Less than high school</b>                        | 10.7                           | 31.4                           |
| <b>High school graduate/GED</b>                     | 8.2                            | 11.9                           |
| <b>Some college, no degree</b>                      | 2.7                            | 7.9                            |
| <b>Associate degree</b>                             | -                              | 7.9                            |
| <b>Bachelor's degree</b>                            | 3.7                            | 7.3                            |
| <b>Some graduate or professional school /degree</b> | -                              | 2.4                            |

- ✓ According to the Ottawa County 2004 BRFSS, 8.9% of respondents indicated no health care coverage, a 2.8% increase since 1999 (6.1%). Respondents with incomes less than \$20,000 (22.4%) were more likely to report no insurance than those whose incomes fell between \$50,000 and \$74,999 annually (7.6%).
- ✓ According to the 2002 Ottawa County Hispanic Migrant Farm Worker Health Survey, approximately 85.0% of Ottawa County's Migrant Farm Workers had no health care coverage, while 64.4% did have coverage for their children.

**Population Uninsured Estimates  
Ottawa County, 2000**

|                          | <u>All Age Groups</u> |            | <u>Children (&lt;18)</u> |            | <u>Seniors (65+)</u> |            |
|--------------------------|-----------------------|------------|--------------------------|------------|----------------------|------------|
|                          | Uninsured             | Population | Uninsured                | Population | Uninsured            | Population |
| <b>Below poverty</b>     | 3,937 (30.1%)         | 13,079     | 1,034 (19.7%)            | 5,258      | 1 (0%)               | 1,142      |
| <b>100-199% poverty</b>  | 4,931 (18.7%)         | 26,405     | 1,323 (13.3%)            | 9,498      | 63 (1.4%)            | 4,521      |
| <b>Over 200% poverty</b> | 14,068 (7.1%)         | 198,829    | 3,239 (5.6%)             | 57,687     | 141 (0.8%)           | 18,344     |
| <b>All income levels</b> | 22,932 (9.6%)         | 238,314    | 5,594 (7.7%)             | 72,442     | 205 (0.9%)           | 24,006     |

**Difficulty Accessing Services**

**Percent Having Difficulty Obtaining Health Care Services within the  
Past Three Years By Age, Gender and Education  
Ottawa County, 1999**

|                                 | 1999 (%) |
|---------------------------------|----------|
| <b>Total</b>                    | 7.3      |
| <b>Male</b>                     | 6.6      |
| <b>Female</b>                   | 7.9      |
| <b>18-24 yrs</b>                | 7.9      |
| <b>25-34 yrs</b>                | 9.0      |
| <b>35-44 yrs</b>                | 5.7      |
| <b>45-54 yrs</b>                | 9.3      |
| <b>55-64 yrs</b>                | 7.9      |
| <b>65-74 yrs</b>                | 6.7      |
| <b>75 yrs +</b>                 | 4.9      |
| <b>Less than high school</b>    | 5.9      |
| <b>High school graduate/GED</b> | 8.6      |
| <b>Some college, no degree</b>  | 8.9      |
| <b>Associate degree</b>         | 5.0      |
| <b>Bachelor's degree</b>        | 5.9      |

## Health System Capacity

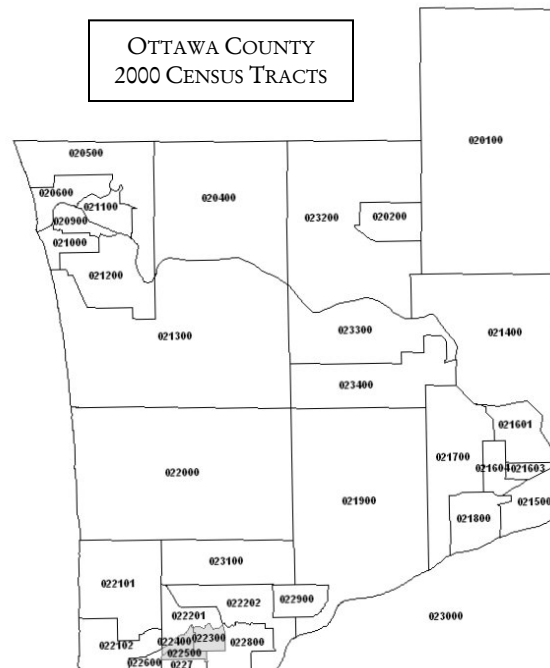
### Inventory of Health System Facilities Ottawa County, 2005

|                                                                 | Number of Facilities | Number of Beds       |
|-----------------------------------------------------------------|----------------------|----------------------|
| Number of Hospitals                                             | 3                    | 331                  |
| Number of Licensed Hospital Beds<br>(rate per total population) | -                    | 138.9<br>per 100,000 |
| Number of Nursing Home Facilities                               | 10                   | 801                  |
| Number of Hospital Long Term Care Units                         | 0                    | 0                    |
| Number of Rural Health Clinic                                   | 1                    | 0                    |
| Number of Home Health Agencies                                  | 4                    | 0                    |
| Number of Hospice (Medicare)                                    | 2                    | 0                    |

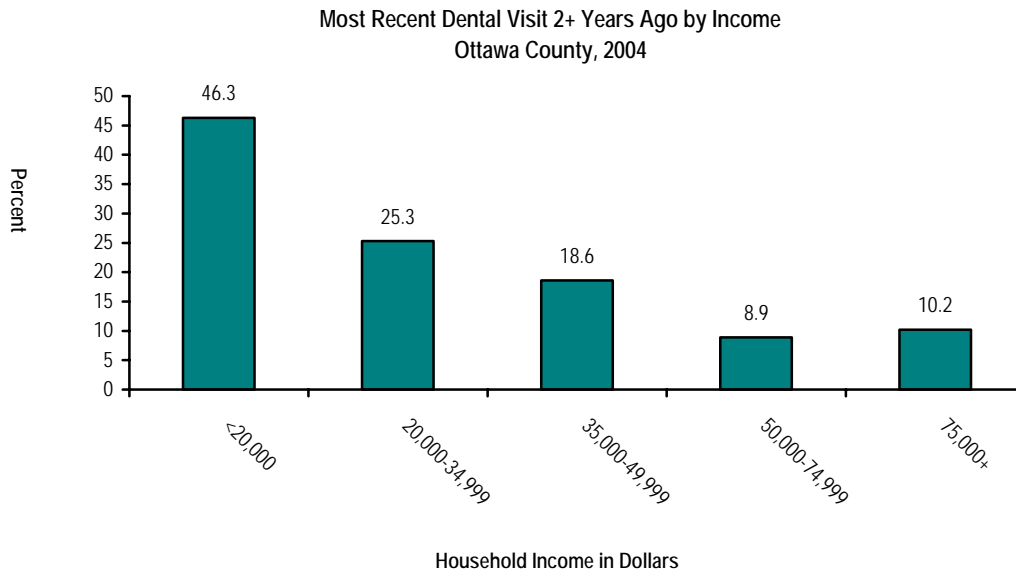
### Primary Health System Personnel Resources Number of Selected Medical Professionals Ottawa County, 2001-2005

|                          | 2001-2004  | Population to<br>Personnel Ratio | 2005 | Population to<br>Personnel Ratio |
|--------------------------|------------|----------------------------------|------|----------------------------------|
| Primary Care Physicians  | 205 (2001) | 1163:1                           | -    | -                                |
| Physician Assistants     | 59 (2002)  | 4039:1                           | 67   | 3557:1                           |
| Certified Nurse Midwives | 5 (2002)   | 47663:1                          | 5    | 3557:1                           |
| Nurse Practitioners      | 77 (2002)  | 3095:1                           | 92   | 2590:1                           |
| Dentists                 | 123 (2004) | 1938:1                           | 126  | 1891:1                           |
| Dental Hygienists        | 260 (2004) | 917:1                            | 268  | 889:1                            |

- ✓ Ottawa County's population-to-physician ratio was calculated as 1,163 to 1. The national standard for population to physician ratio is 1,500 to 1.
- ✓ As of 2005, within Ottawa County, there were three census tracts that were designated as medically underserved areas or populations. These were tracts 223, 224 and 225.



- ✓ As of December 2005, Ottawa County was designated as a primary care health professional shortage area in the rural settings that house the majority of the migrant population. These seasonal workers reside far distances from the concentration of primary health care providers. Ottawa County was also designated as a mental health professional shortage area. There were no designated dental health professional shortage areas in Ottawa County.

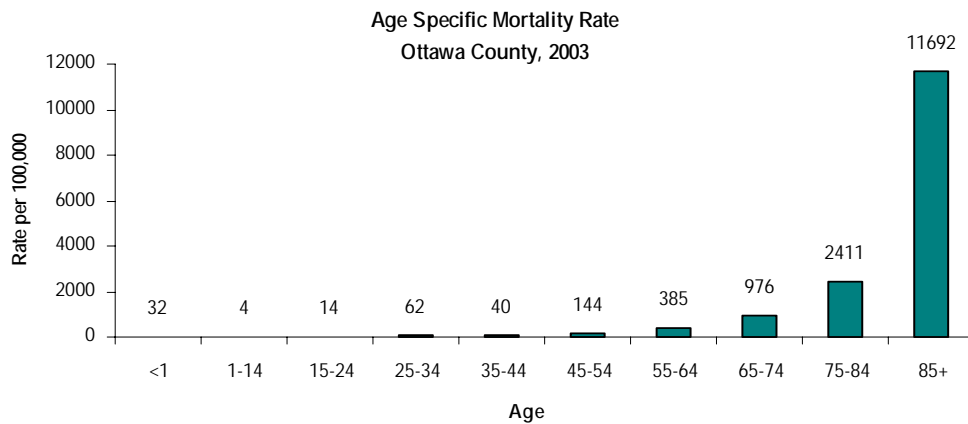
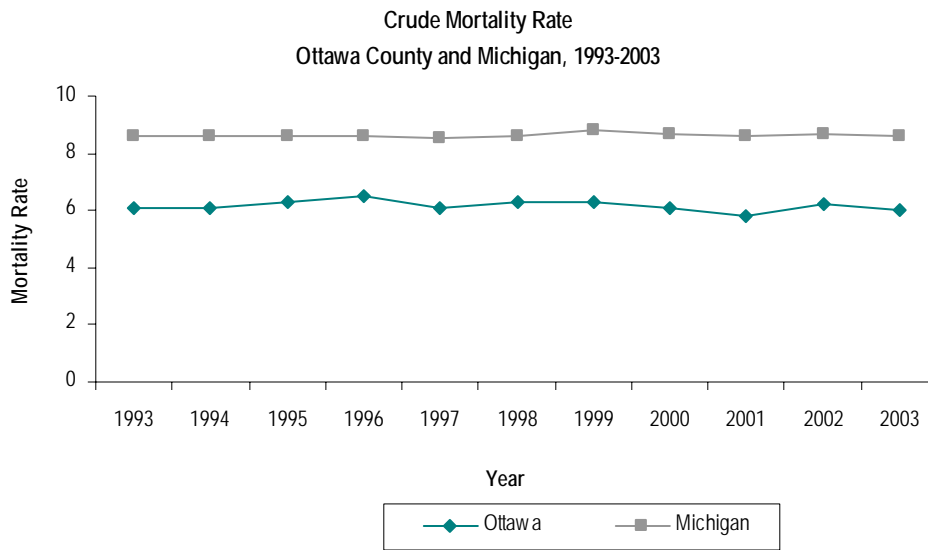


- ✓ According to the Ottawa County 2004 BRFSS, there was an increase in the proportion of respondents indicating that they had not been to a dentist. In 2004, 17.3% and in 1999, 15.5% indicated that they had not been to a dentist in the past year. Respondents with lower educational attainment were more likely to indicate their last dental visit within 2 or more years compared to respondents with higher education. Uninsured respondents and respondents who earn less were more likely to indicate their last dental visit within 2 or more years compared to insured respondents and those who earn more.
- ✓ During 2002, 54.3% of children (0 to 19 years old) had a dental visit. During 2002, 22% of children on Medicaid (0 to 19 years old) had a dental visit.
- ✓ During 2002, 51.4% of children (0 to 19 years old) had a preventive dental visit. During 2002, 19% of children on Medicaid (0 to 19 years old) had a preventive dental visit.

# MORTALITY

The health status in a community is also assessed using indicators of mortality (death). Mortality statistics provide insight into reasons behind loss of life and as such, can aid in development of programs to reduce burden of mortality upon the community. Specific measures used to evaluate mortality include death rates, leading causes of death and premature mortality. Age-adjusted rates are used to eliminate the effects of different age distribution in the comparison groups. All age-adjusted rates are standardized using the U.S. population 2000. Premature mortality is measured in terms of years of potential life lost.

## Death Rates



- ✓ The crude mortality death rates indicated that Ottawa County residents were less likely to die than residents of Michigan. No significant change in the crude mortality death rates have occurred in the past 10 years for Ottawa County.
- ✓ In 2003, Ottawa County had a lower age-adjusted death rate than Michigan (667.4 versus 846.4 per 100,000).
- ✓ In Ottawa County, males (777.0 per 100,000) had a higher age-adjusted death rate compared to females (583.5 per 100,000). The same pattern was observed for the state of Michigan (1,007.8 versus 722.1 per 100,000).
- ✓ Overall in Ottawa County, the risk of death dropped after age one, and then rose with increasing age. Individuals 85 and over had the highest risk of death.

**Death Rates by Age and Gender  
Ottawa County, 2003**

| Age in Years               | Total        | Male         | Female       |
|----------------------------|--------------|--------------|--------------|
| <b>All Ages Crude Rate</b> | 600.3        | 566.9        | 632.7        |
| <b>Under 1</b>             | 642.1        | 581.7        | 703.0        |
| 1-14                       | *            | *            | *            |
| 15-24                      | 15.7         | *            | *            |
| 25-34                      | 46.4         | 57.4         | 36.1         |
| 35-44                      | 46.5         | 61.1         | *            |
| 45-54                      | 127.0        | 152.5        | 101.2        |
| 55-64                      | 242.2        | 353.7        | 131.2        |
| 65-74                      | 594.6        | 698.4        | 491.9        |
| 75-84                      | 1,756.2      | 2,048.0      | 1,502.6      |
| 85 & over                  | 4,747.1      | 5,820.1      | 4,016.6      |
| <b>Age-adjusted rate</b>   | <b>667.4</b> | <b>777.0</b> | <b>583.5</b> |

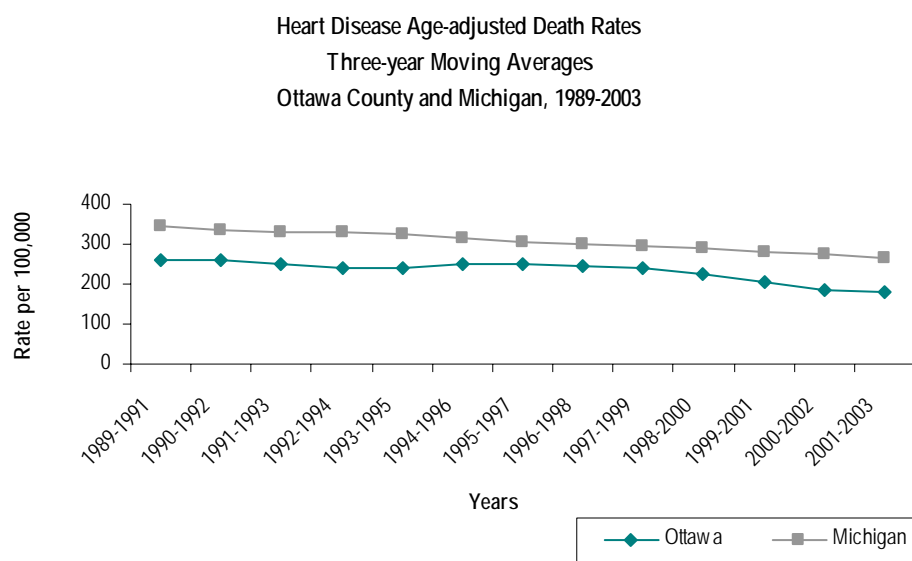
\*Number of cases is too small to calculate a reliable rate.

## Leading Causes of Death

**Ten Leading Causes of Death  
Rates per 100,000  
Ottawa County and Michigan, 2003**

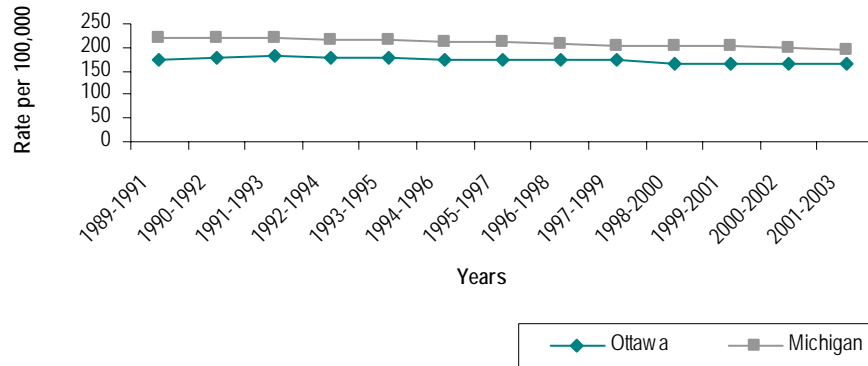
| Rank | Ottawa County                     | Rate  | Michigan                          | Rate  |
|------|-----------------------------------|-------|-----------------------------------|-------|
| 1    | Heart Disease                     | 162.4 | Heart Disease                     | 256.4 |
| 2    | Cancer                            | 133.9 | Cancer                            | 194.2 |
| 3    | Stroke                            | 40.9  | Stroke                            | 53.7  |
| 4    | Unintentional Injuries            | 28.9  | Chronic Lower Respiratory Disease | 43.9  |
| 5    | Alzheimer's Disease               | 28.9  | Unintentional Injuries            | 32.5  |
| 6    | Chronic Lower Respiratory Disease | 27.3  | Diabetes Mellitus                 | 26    |
| 7    | Pneumonia/Influenza               | 19.2  | Alzheimer's Disease               | 21    |
| 8    | Diabetes Mellitus                 | 18.4  | Pneumonia/Influenza               | 19.2  |
| 9    | Kidney Disease                    | 13.2  | Kidney Disease                    | 16.4  |
| 10   | Intentional Self-harm             | 7.6   | Intentional Self-harm             | 10.1  |

- ✓ In 2003, Ottawa County residents were less likely to die from the top ten leading causes of death than Michigan residents with the exception of Alzheimer's disease and pneumonia. Ottawa County had a higher death rate from Alzheimer's disease.
- ✓ In 2003, the first through the third leading causes of death were the same for Ottawa County and Michigan, with heart disease as the leading cause of death for both populations.
- ✓ Ottawa County residents aged 75 and older were impacted more by the top four leading causes of death compared to other age groups.
- ✓ In Ottawa County, more females died from heart disease, stroke and diabetes mellitus compared to males in 2003. More males died from cancer, respiratory diseases and unintentional injuries than females.



- ✓ Heart disease remained the leading cause of death in Ottawa County and Michigan.
- ✓ In 2003, there were 405 deaths due to heart disease in Ottawa County. The age-adjusted rate for heart disease deaths was 179.9 per 100,000 populations, which was below the Michigan rate of 252.4 per 100,000 populations.
- ✓ The age-adjusted heart disease death rate in Ottawa County and Michigan continued to decline during the past 15 years.
- ✓ In 2003, nearly three-quarters (71.1%) of all deaths in Ottawa County due to heart disease occurred to individuals 75 years of age and older compared to 66.1% for Michigan.
- ✓ In 2003, Ottawa County and Michigan males had higher rates of heart disease death than females. The age adjusted heart disease death rates for Ottawa County and Michigan males were 208.6 and 309.2 deaths per 100,000 compared to 155.0 and 209.2 for females, respectively.
- ✓ In 2003, heart disease death rates were highest among whites at 169.5 per 100,000.

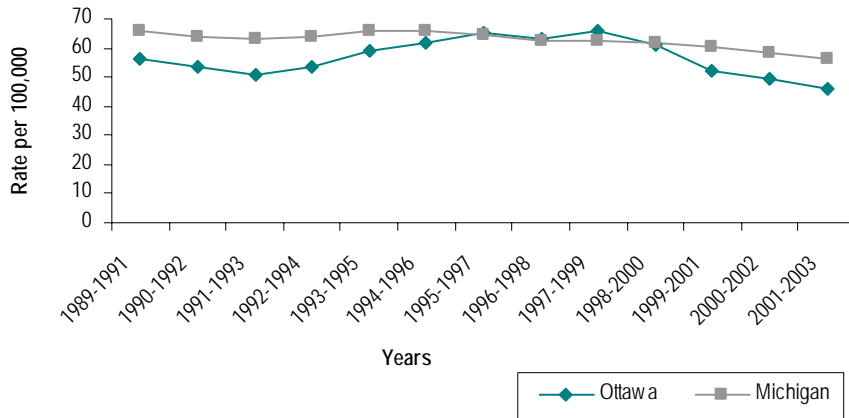
**Cancer Age-adjusted Death Rates  
Three-year Moving Averages  
Ottawa County and Michigan, 1989-2003**



- ✓ Cancer was the second leading cause of death in Ottawa County and Michigan. The most common cancers in Ottawa County were prostate cancer, lung cancer, breast cancer and colorectal cancer.
- ✓ In 2003, there were 334 deaths due to cancer in Ottawa County. The age-adjusted rate for cancer deaths was 152.8 per 100,000 populations, which was below the Michigan rate of 192.0 per 100,000 populations.
- ✓ The age-adjusted cancer death rate in Ottawa County has been on the decline.
- ✓ In 2003, half (50.9%) of all deaths in Ottawa County due to cancer occurred to individuals 75 years of age and older compared to 51.8% for individuals 45 to 74 years in Michigan.
- ✓ In 2003, in Ottawa County and Michigan, males had a higher rate of cancer death than females. The age adjusted cancer death rates for Ottawa County and Michigan males were 187.0 and 235.2 deaths per 100,000 compared to 128.9 and 162.9 for females, respectively.
- ✓ In 2003, cancer death rates were highest among whites at 155.5 per 100,000.
- ✓ Cancer incidence trends for prostate and colorectal cancer has been on the decline. The age adjusted rates for prostate cancer declined from 78.0 per 100,000 in 1988-1992 to 62.7 per 100,000 in 1998-2002. Colorectal cancer declined from 75.0 per 100,000 in 1988-1992 to 47.5 per 100,000 in 1998-2002.
- ✓ The trends for lung cancer and breast cancer have remained the same across the years studied.

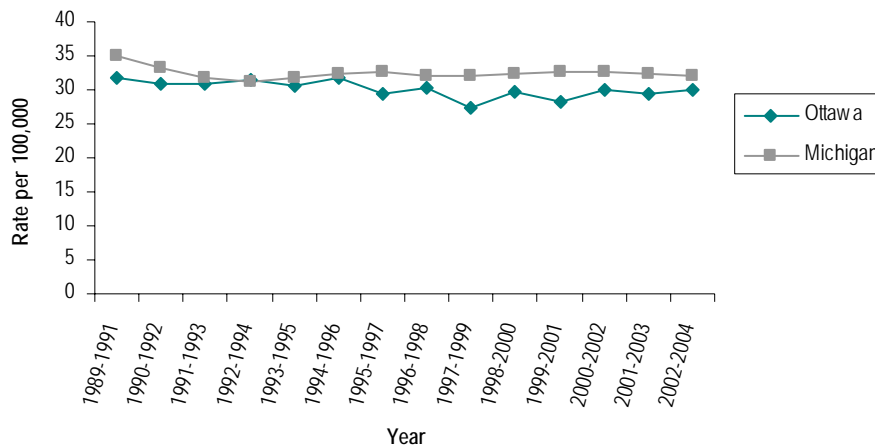


Stroke Age-adjusted Death Rates  
 Three-year Moving Averages  
 Ottawa County and Michigan, 1989-2003



- ✓ Stroke was the third leading cause of death in Ottawa County and Michigan.
- ✓ In 2003, there were 102 deaths due to stroke in Ottawa County. The age-adjusted rate for stroke deaths was 45.6 per 100,000 populations, which was below the Michigan rate of 52.9 per 100,000 populations.
- ✓ The age-adjusted stroke death rate in Ottawa County and Michigan has continued to decline during the past five years.
- ✓ In 2003, 86.3% of all deaths in Ottawa County due to stroke occurred to individuals 75 years of age and older compared to 75% for Michigan.
- ✓ In 2003, in Ottawa County and Michigan, males had higher rates of stroke death than females. The age adjusted stroke death rates for Ottawa County and Michigan males were 52.4 and 53.2 deaths per 100,000 compared to 41.3 and 52.0 for females, respectively.
- ✓ In 2003, the stroke death rate was highest among whites at 41.9 per 100,000.

Accidents Age Adjusted Death Rates  
 Three Year Moving Averages  
 Ottawa County and Michigan, 1989-2004



- ✓ Unintentional injuries were the fourth leading cause of death in Ottawa County. The three year age-adjusted rate indicates that an unintentional injury death gradually declined in Ottawa County, from 31.8 per 100,000 in 1989-1991 to 29.4 per 100,000 in 2001-2003. Ottawa County residents were less likely to die from unintentional injuries compared to all Michigan residents (34.9 per 100,000 in 1989-1991 to 32.4 per 100,000 in 2001-2003).
- ✓ From 2001 to 2003, the age-adjusted death rate for unintentional injury was highest among individuals 75 years of age and older (139.4 per 100,000) compared to those 25 to 74 years old (26.2 per 100,000) and under 25 years old (17.9 per 100,000).
- ✓ Within the period 1997 to 2002, in Ottawa County, males were more likely to die from unintentional injury compared to females.
- ✓ In 2003, unintentional injuries death rates were highest among whites at 28.1 per 100,000.

## Premature Mortality

**Causes of Death**  
**Rates per 100,000 of Years of Potential Life Lost Below Age 75**  
**Ottawa and Michigan, 2003**

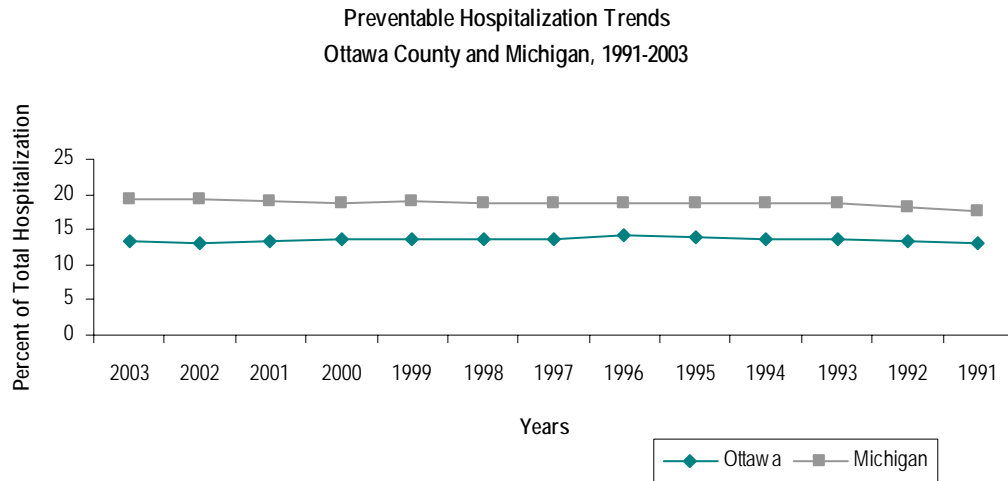
| Rank | Ottawa County               | Rate  | Michigan                                               | Rate    |
|------|-----------------------------|-------|--------------------------------------------------------|---------|
| 1    | Cancer                      | 986.2 | Cancer                                                 | 1,608.7 |
| 2    | Accidents                   | 821.1 | Heart disease                                          | 1,330.6 |
| 3    | Heart Disease               | 675.1 | Accidents                                              | 879.3   |
| 4    | Diabetes                    | 97.3  | Certain conditions originating in the perinatal period | 493.6   |
| 5    | Chronic Respiratory Disease | 74.1  | Intentional self-harm (suicide)                        | 334.2   |
| 6    | Influenza and Pneumonia     | 46.6  | Assault (Homicide)                                     | 284.7   |
| 7    | Kidney Disease              | 44.4  | Congenital abnormalities                               | 211.9   |
| 8    | -                           |       | Cerebrovascular disease                                | 200.5   |
| 9    | -                           |       | Chronic Lower Respiratory disease                      | 181.5   |
| 10   | -                           |       | Liver Disease and Cirrhosis                            | 179.7   |

- ✓ In 2003, with the exception of influenza and pneumonia, males were at a greater risk of years of potential life lost for all the leading causes of death compared to females in Ottawa County. The same trend was observed in Michigan for all the leading causes of death.
- ✓ In 2003, Ottawa County residents were at lesser risk of potential years of life lost for the leading causes of death compared to the state.
- ✓ From 1980 to 2000, Ottawa County and Michigan females had a higher life expectancy compared to their male counterparts

## MORBIDITY

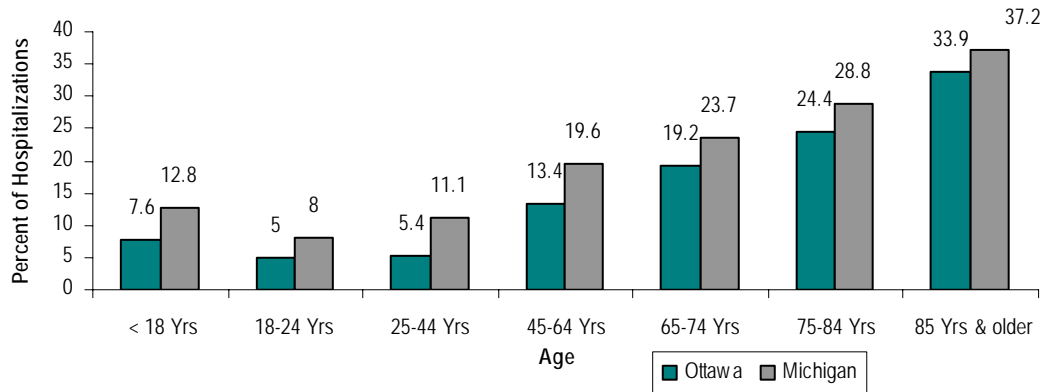
People may suffer from diseases and health conditions that are not necessarily or immediately fatal, yet these conditions strongly impact quality of life and productivity. As such, another measure of the community's health is the amount of morbidity, or sickness, and the causes of these deviations from wellness. Morbidity is difficult to evaluate. There is no comprehensive surveillance system in place to monitor the incidence of all conditions contributing to morbidity. However, three measures used to evaluate morbidity include hospitalization discharges, cancer surveillance and communicable disease surveillance.

### Preventable Hospitalization



- ✓ The preventable hospitalization trend above indicates that Ottawa County residents over the years are less likely to be hospitalized than residents of Michigan. No significant change in the trend of preventable hospitalization has occurred in the past 10 years for Ottawa County.
- ✓ In comparison across age groups, the lower hospitalization rate holds true for Ottawa County. Ottawa County residents in all age groups in 2003 were less likely to be hospitalized than all Michigan residents.

Preventable Hospitalization by Age Group  
Ottawa County and Michigan, 2003

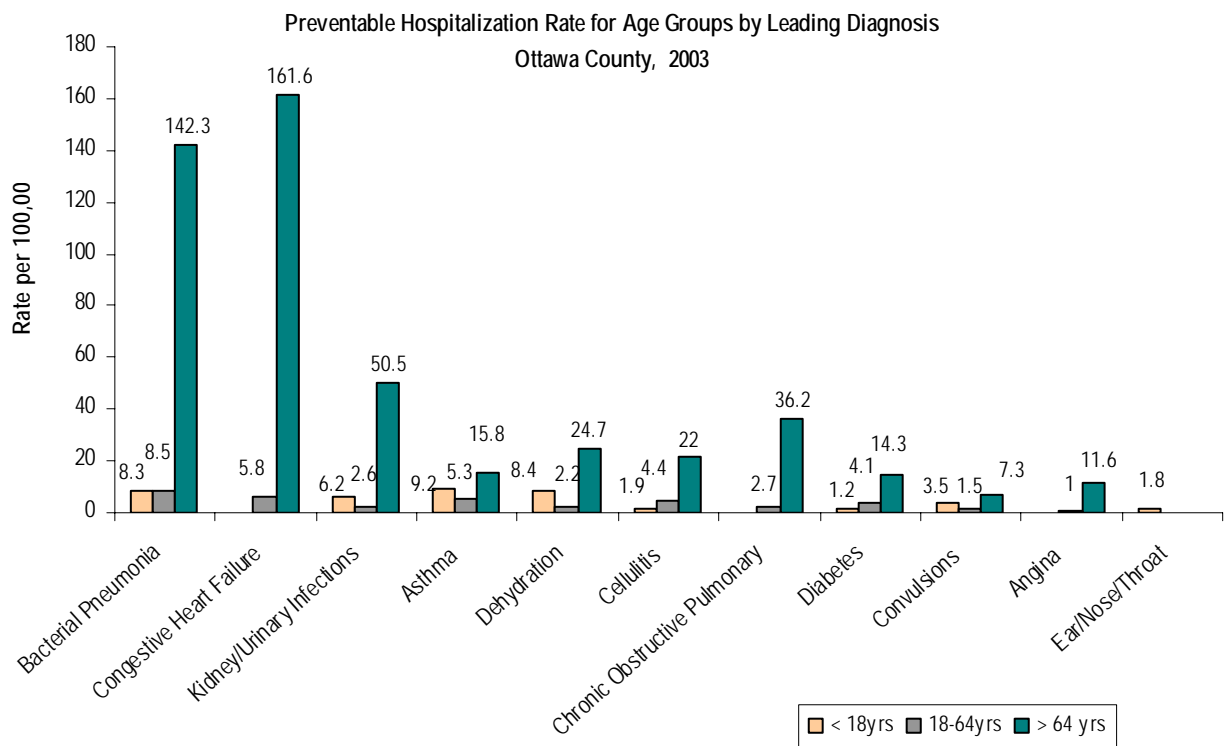


- ✓ In Ottawa County, individuals aged 85 years and older had the highest rate (1,448.9 per 100,000) of preventable hospitalization followed by individuals 75 to 84 years old (773.7 per 100,000).
- ✓ In 2003, 56.5% of preventable hospitalizations occurred in females compared to 43.5% in males.

Ten Leading Causes of Preventable Hospitalization  
Rates per 100,000  
Ottawa County and Michigan, 2003

| Rank | Ottawa County                 | Rate | Michigan                      | Rate |
|------|-------------------------------|------|-------------------------------|------|
| 1    | Bacteria Pneumonia            | 22.3 | Congestive Heart Failure      | 41.9 |
| 2    | Congestive Heart Failure      | 20.5 | Bacteria Pneumonia            | 36.9 |
| 3    | Kidney/Urinary Infections     | 8.5  | Chronic Obstructive Pulmonary | 20.5 |
| 4    | Asthma                        | 7.4  | Asthma                        | 16.3 |
| 5    | Dehydration                   | 6.3  | Kidney/Urinary Infections     | 13.9 |
| 6    | Cellulitis                    | 5.6  | Cellulitis                    | 11.6 |
| 7    | Chronic Obstructive Pulmonary | 5.5  | Dehydration                   | 11.4 |
| 8    | Diabetes                      | 4.4  | Diabetes                      | 11.4 |
| 9    | Convulsions                   | 2.6  | Convulsions                   | 7.7  |
| 10   | Angina                        | 1.8  | Angina                        | 4    |

- ✓ Ottawa County residents in 2003 were less likely to be hospitalized from the top ten leading causes of preventable hospitalization compared to all Michigan residents.
- ✓ In 2003, the leading cause of preventable hospitalization in Ottawa County was bacteria pneumonia, accounting for 18.3% of all preventable hospitalizations followed by congestive heart failure (16.8%). These two diseases were ranked the second (14.7%) and first (16.7%) leading cause of preventable hospitalizations in Michigan.



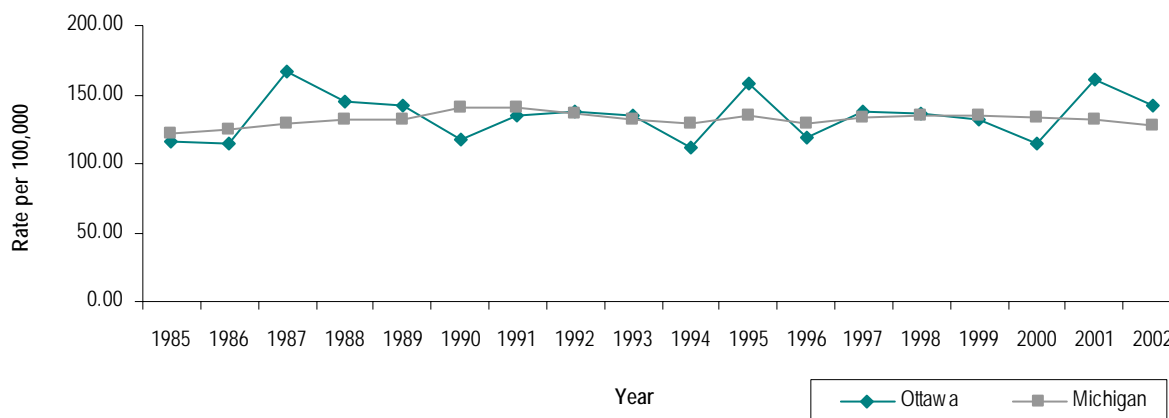
- ✓ In 2003, Ottawa County residents aged 65 years and older had a higher rate (671.3 per 100,000) of all preventable hospitalization compared to those under 18 years old (55.5 per 100,000) and 18 to 64 years old (59.3 per 100,000).
- ✓ In 2003, based on leading diagnoses, asthma had the highest rate (9.2 per 100,000) of preventable hospitalization followed by dehydration (8.4 per 100,000) and bacteria pneumonia (8.3 per 100,000) for Ottawa County residents under 18 years of age.
- ✓ In 2003, based on leading diagnoses, bacteria pneumonia had the highest rate (8.5 per 100,000) of preventable hospitalization followed by congestive heart failure (5.8 per 100,000) and asthma (5.3 per 100,000) for Ottawa County residents 18 to 64 years of age.
- ✓ In 2003, based on leading diagnoses, congestive heart failure had the highest rate (161.6 per 100,000) of preventable hospitalization followed by bacteria pneumonia (142.3 per 100,000) and kidney/urinary infections (50.5 per 100,000) for Ottawa County residents 64 years and older.

**Leading Causes of Preventable Hospitalizations  
Patients Age 18 Years and Above  
Ottawa County, 2003**

|                                        | 18-24 |      | 25-44 |      | 45-64 |      | 65-74 |      | 75-84 |      | 85+ |      |
|----------------------------------------|-------|------|-------|------|-------|------|-------|------|-------|------|-----|------|
|                                        | N     | %    | N     | %    | N     | %    | N     | %    | N     | %    | N   | %    |
| All Preventable Hospitalizations       | 73    | 100  | 274   | 100  | 576   | 100  | 470   | 100  | 722   | 100  | 549 | 100  |
| Diabetes                               | 13    | 17.8 | 24    | 8.8  | 27    | 4.7  | 16    | 3.4  | 15    | 2.1  | 6   | 1.1  |
| Asthma                                 | 9     | 12.3 | 25    | 9.1  | 48    | 8.3  | 20    | 4.3  | 11    | 1.5  | 10  | 1.8  |
| Bacterial Pneumonia                    | 5     | 6.9  | 28    | 10.2 | 99    | 17.2 | 90    | 19.2 | 147   | 20.4 | 132 | 24   |
| Cellulites                             | 4     | 5.5  | 21    | 7.7  | 44    | 7.6  | 29    | 6.2  | 17    | 2.4  | 11  | 2    |
| Convulsions                            | 4     | 5.5  | 10    | 3.7  | 9     | 1.6  | 7     | 1.5  | 0     | 0    | 7   | 1.3  |
| Grand Mal & Other Epileptic            | 4     | 5.5  | 9     | 3.3  | 0     | 0    | 0     | 0    | 0     | 0    | 0   | 0    |
| Gastroenteritis                        | 3     | 4.1  | 8     | 2.9  | 0     | 0    | 0     | 0    | 9     | 1.3  | 0   | 0    |
| Kidney/Urinary Infections              | 3     | 4.1  | 18    | 6.6  | 19    | 3.3  | 28    | 6    | 55    | 7.6  | 48  | 8.7  |
| Dental Conditions                      | 2     | 2.7  | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0   | 0    |
| Dehydration                            | 2     | 2.7  | 15    | 5.5  | 18    | 3.1  | 14    | 3    | 30    | 4.2  | 20  | 3.6  |
| Pelvic Inflammatory Disease            | 0     | 0    | 7     | 2.6  | 0     | 0    | 0     | 0    | 0     | 0    | 0   | 0    |
| Congestive Heart Failure               | 0     | 0    | 0     | 0    | 85    | 14.8 | 92    | 19.6 | 181   | 25.1 | 146 | 26.6 |
| Chronic Obstructive Pulmonary          | 0     | 0    | 0     | 0    | 39    | 6.8  | 41    | 8.7  | 40    | 5.5  | 13  | 2.4  |
| Angina                                 | 0     | 0    | 0     | 0    | 12    | 2.1  | 10    | 2.1  | 15    | 2.1  | 5   | 0.9  |
| All Other Preventable Hospitalizations | 24    | 32.9 | 109   | 39.8 | 176   | 30.6 | 123   | 26.2 | 202   | 28   | 151 | 27.5 |

## Cancer Surveillance

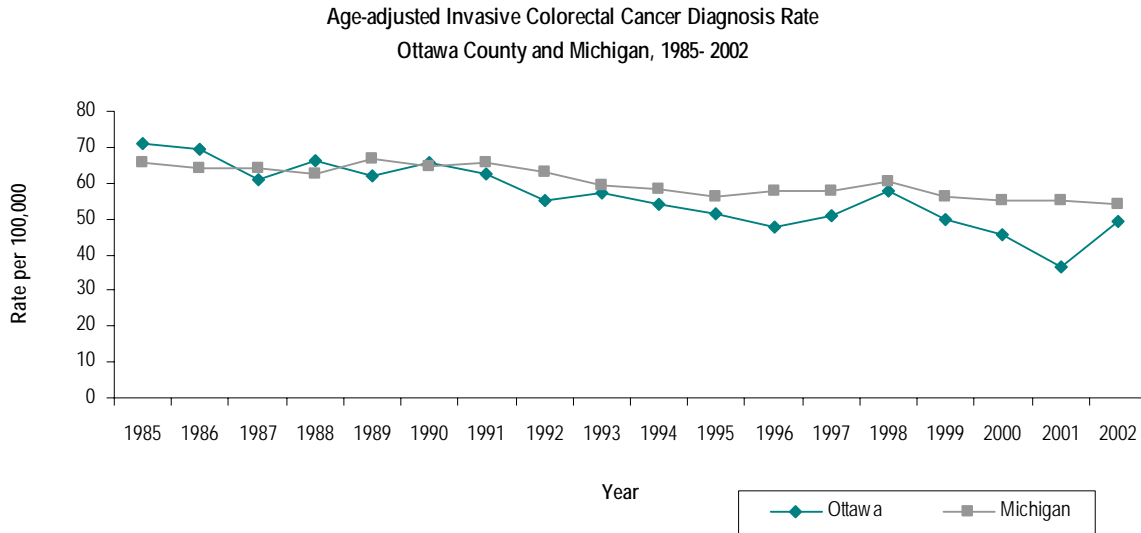
Age-adjusted Invasive Breast Cancer Diagnosis Rate  
Ottawa County and Michigan, 1985- 2002



- ✓ In Ottawa County, the age-adjusted rate for breast cancer diagnosis fluctuated from 1985 to 2002, however, the overall trend indicated an increase. In 1985, the age adjusted rate was 116.5 per 100,000 and increased to 142.2 per 100,000 in 2002. In Michigan the rate was stable from 1985 to 2002.
- ✓ From 2000 to 2002, the age-adjusted rate for breast cancer incidence indicated that females aged 75 years and older in Ottawa County were more likely to be diagnosed

with breast cancer(424.0 per 100,000) than females 50 to 74 years old (366.3 per 100,000) and less than 50 years old (43.4 per 100,000).

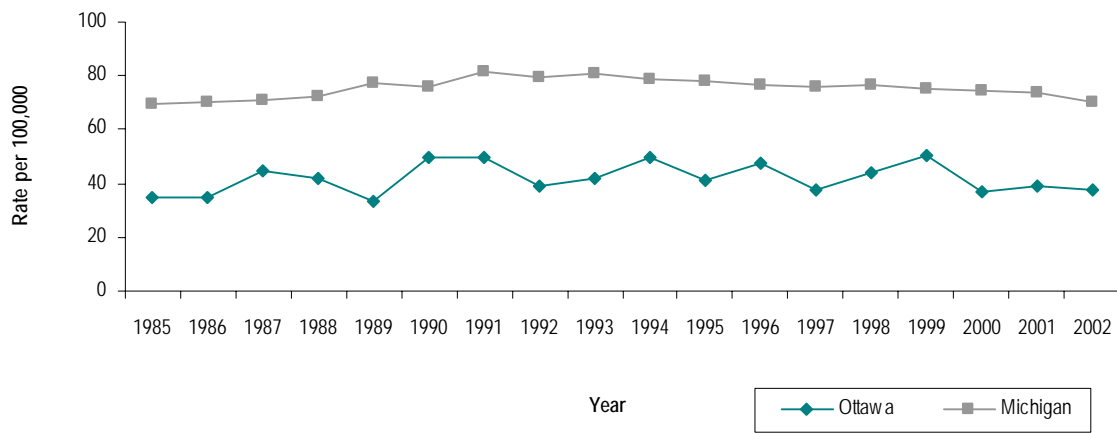
- ✓ From 2000 to 2002, Ottawa County females less than 74 years old were more likely than their Michigan counterparts to be diagnosed with breast cancer. Michigan age-adjusted rates for the following age groups are as follows: less than 50 years old (42.5 per 100,000), 50 to 74 years (344.2 per 100,000). Michigan females 75 years and older were more likely to be diagnosed with breast cancer (440.0 per 100,000) than their Ottawa County counterparts.



- ✓ In Ottawa County, the age-adjusted rate for colorectal cancer diagnosis declined from 1985 to 2002. In Michigan the rate of decline was more subtle (from 54.0 in 1985 to 65.8 in 2002) than in Ottawa County (from 49.4 in 1985 to 71.2 in 2002).
- ✓ From 2000 to 2002, the age-adjusted rate for colorectal cancer incidence indicated that individuals aged 75 years and older (344.3.0 per 100,000) in Ottawa County were more likely to be diagnosed with colorectal cancer than those 50 to 74 years old (85.5 per 100,000) and less than 50 years old (4.3 per 100,000).
- ✓ From 2000 to 2002, Michigan residents were more likely than their Ottawa County counterparts to be diagnosed with colorectal cancer. Michigan age-adjusted rates for the following age groups were as follows: less than 50 years old (6.4 per 100,000); 50 to 74 years (123.7 per 100,000) and 75 and older (378.3 per 100,000).

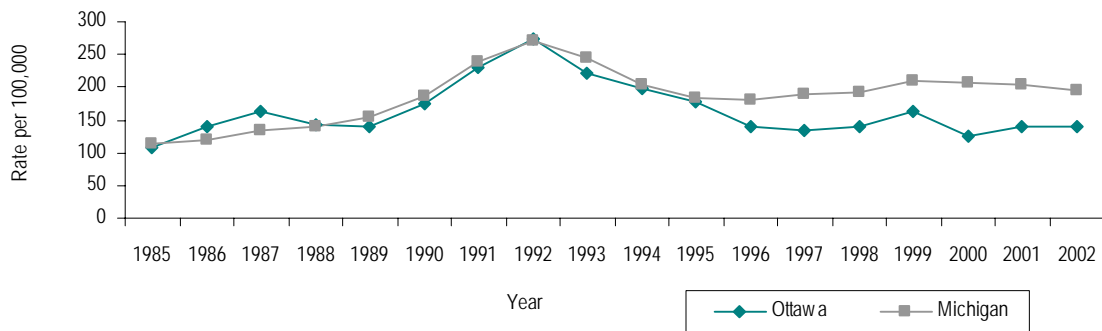


Age-adjusted Invasive Lung Cancer Diagnosis Rate  
Ottawa County and Michigan, 1985- 2002



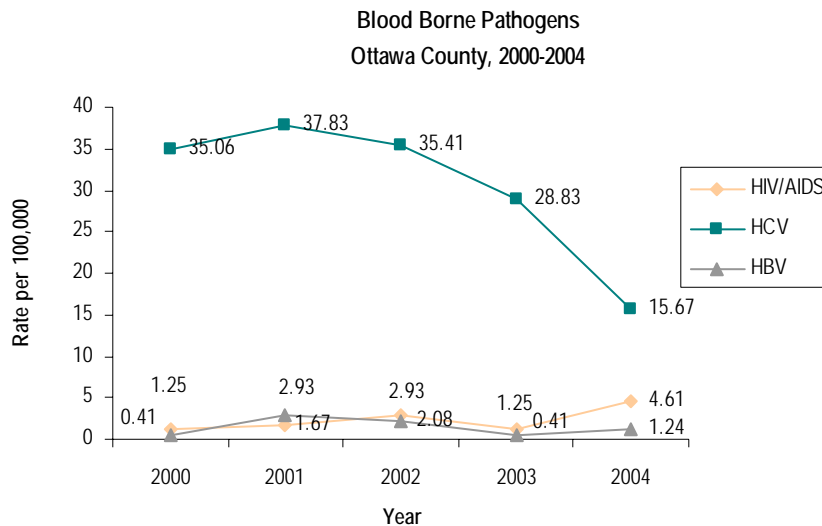
- ✓ From 1985 to 2002 the age-adjusted rate for lung cancer diagnosis from 1985 to 2002 in Ottawa County fluctuated. Overall, the trend indicated an increase. In 1985 the age adjusted rate was 34.4 per 100,000 and increased to 37.8 per 100,000 in 2002 (Note all the fluctuating rates were always above the rate in 1985). In Michigan the rate was stable from 1985 to 2002.
- ✓ From 2000 to 2002, the age-adjusted rate for lung cancer incidence indicated that residents aged 75 years and older in Ottawa County were more likely to be diagnosed with lung cancer (200.6 per 100,000) than those 50 to 74 years old (101.5 per 100,000) and less than 50 years old (3.4 per 100,000).
- ✓ From 2000 to 2002, Michigan residents were more likely than their Ottawa County counterparts to be diagnosed with lung cancer: Michigan age-adjusted rates for the following age groups were as follows; less than 50 years old (6.0 per 100,000); 50 to 74 years (204.4 per 100,000) and 75 and older (385.0 per 100,000).

Age-adjusted Invasive Prostate Cancer Diagnosis  
Ottawa County and Michigan, 1985- 2002

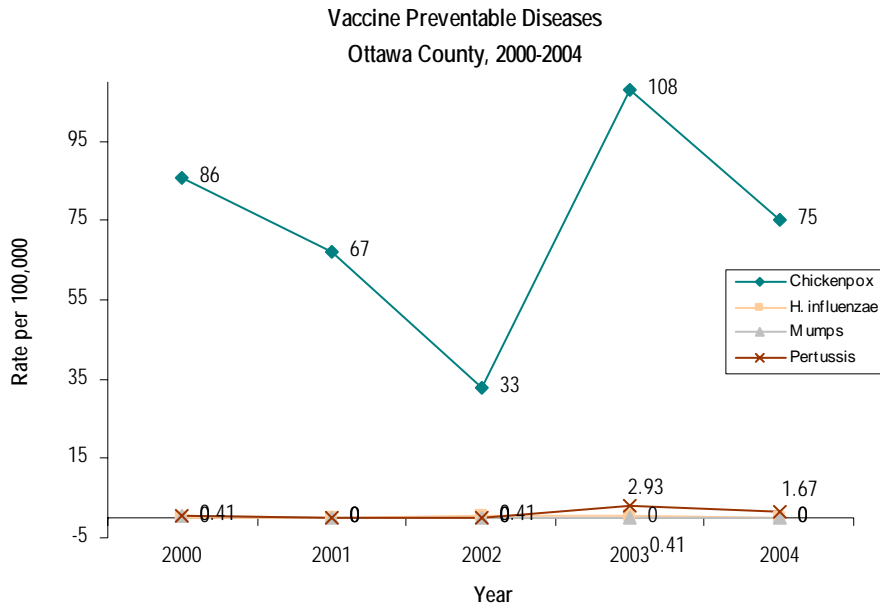


- ✓ In Ottawa County and Michigan, the trend for prostate cancer diagnosis was similar. The age-adjusted rate indicated a decline after a spike in 1992.
- ✓ From 2000 to 2002, the age-adjusted rate for prostate cancer incidence indicated that males aged 75 years and older in Ottawa County were more likely to be diagnosed with prostate cancer (635.3 per 100,000) than males 50 to 74 years old (413.4 per 100,000) and less than 50 years old (2.5 per 100,000).
- ✓ From 2000 to 2002, Michigan males were more likely than their Ottawa County counterparts to be diagnosed with prostate cancer. Michigan age-adjusted rates for the following age groups were as follows: less than 50 years old (7.1 per 100,000); 50 to 74 years (578.3 per 100,000) and 75 and older (1,096.5 per 100,000).

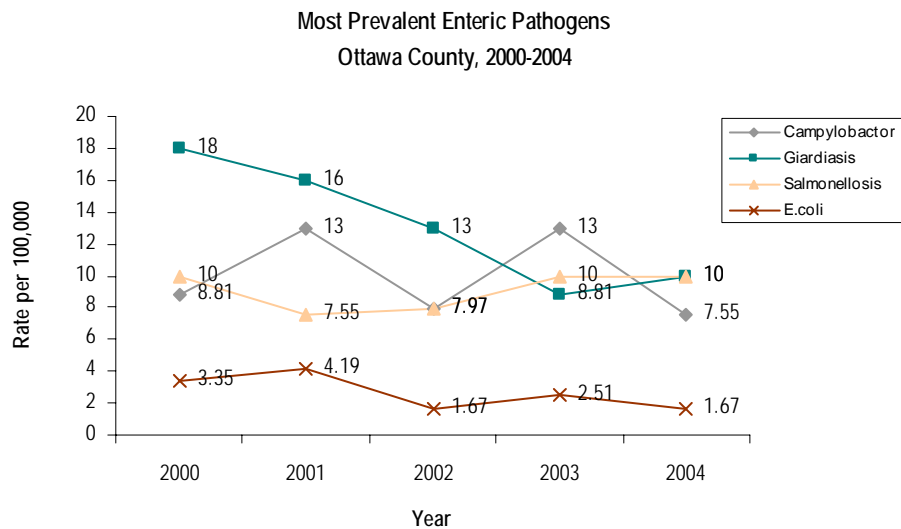
## Communicable Disease Surveillance



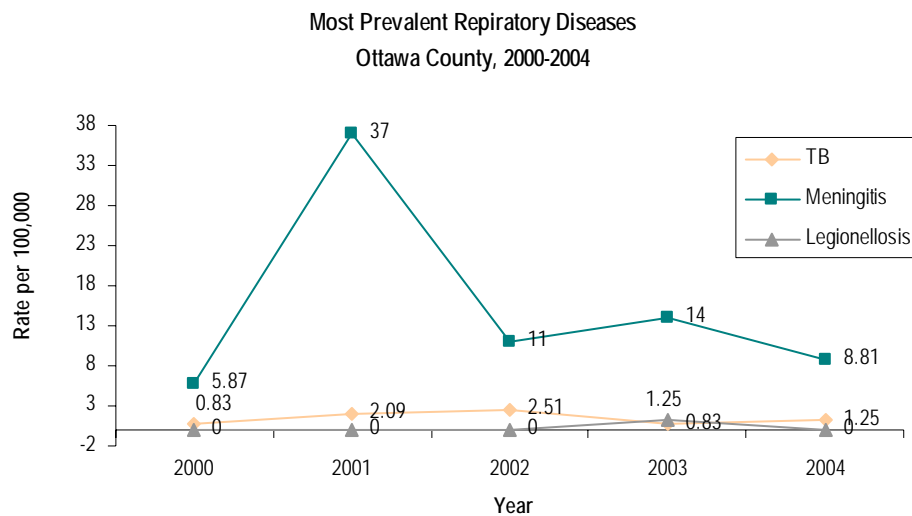
- ✓ In Ottawa County, the rate of hepatitis C declined from 35.41 per 100,000 in 2002 to 15.67 in 2004. From 2000 to 2004, the highest prevalence of hepatitis C was found among persons age 45 to 49 years old (26.95%) followed by persons 40 to 44 years old (20.49%). Males were more likely to be diagnosed with hepatitis C (64.96%) compared to females (34.50%).
- ✓ In Ottawa County, the rates of HIV/AIDS gradually increased from 1.25 per 100,000 in 2000 to 4.61 per 100,000 in 2004. There was approximately a 70% increase observed from 2003 to 2004.
- ✓ In Ottawa County, the rates for hepatitis B fluctuated from 2000 to 2003. Between 2003 and 2004 there was a significant increase in rates from 0.41 per 100,000 to 1.24 per 100,000. The age group 25 to 29 years had the highest prevalence of hepatitis B (29.4%) from 2000 to 2004.



- ✓ In comparison to Michigan, Ottawa County had a higher rate of chickenpox diagnosis from 2000 to 2004 (294.0 per 100,000 versus 371.0 per 100,000). In Ottawa County the rate of chickenpox diagnosis declined after a spike was observed in 2003. Chickenpox prevalence was highest among children 5 to 9 years old (7%) followed by 10 to 14 years old (2.15%) and 1 to 4 years old (0.9%).
- ✓ From 2000 to 2004, the second most prevalent vaccine preventable disease in Ottawa County was pertussis (5.03 per 100,000). From 2000 to 2004, infants under the age of 1 year had the highest prevalence of pertussis (33%) followed by those 30 to 34 years old. Within the same time frame, males (67%) were more likely to be diagnosed with pertussis compared to females (33%).

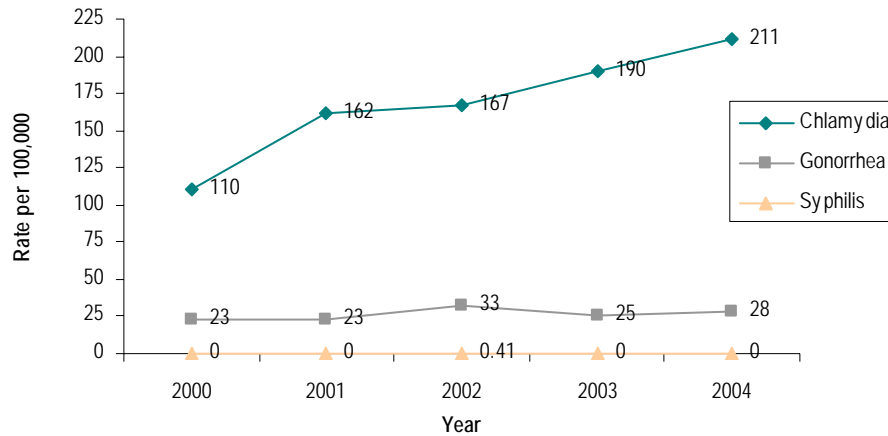


- ✓ In Ottawa County, the most prevalent communicable disease caused by an enteric pathogen in 2000 to 2004 was giardiasis (67.0 per 100,000). There was a decreasing trend in the rate of giardiasis from 2000 to 2003. Giardiasis was most prevalent among children 1 to 4 years old (27.5%) followed by 5 to 9 years old and 35 to 39 years old (both 11.25%).
- ✓ The second most prevalent enteric pathogen causing disease was campylobacter. The rates fluctuated from 2000 to 2004. Campylobacter was most prevalent among persons aged 45 to 49 years (15%) followed by 1 to 4 years old (10.8%).
- ✓ Salmonellosis rates fluctuated from 2000 to 2004. It was found to be most prevalent among persons aged 1 to 4 years (14.9%) followed by 15 to 19 years old (12.3%).



- ✓ In Ottawa County from 2000 to 2004, the most prevalent respiratory disease was meningitis. The rate of meningitis declined from 37 per 100,000 in 2001 to 8.81 per 100,000 in 2004. Meningitis was found to be most prevalent amongst children aged 5 to 9 years old (13.4%) followed by 10 to 14 years old (11.3%) and those under 1 year old (9.7%).
- ✓ Tuberculosis was the second most prevalent respiratory disease in Ottawa County from 2000 to 2004.

Most Prevalent Sexually Transmitted Diseases  
Ottawa County, 2000-2004

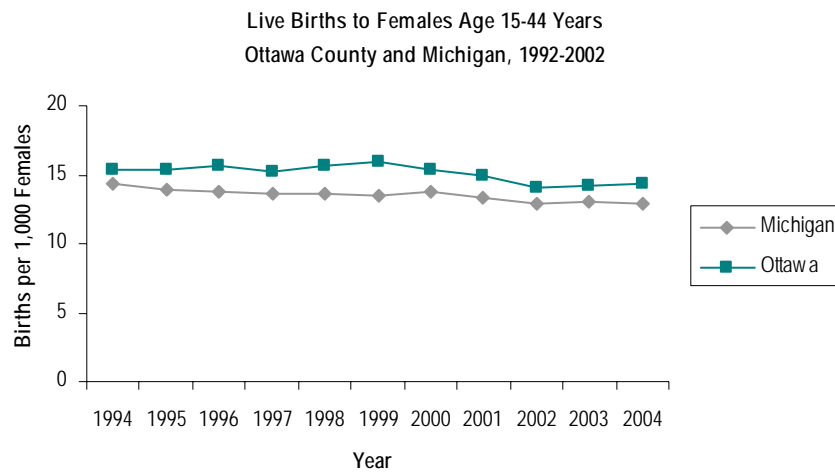


- ✓ In Ottawa County, the most prevalent sexually transmitted disease was chlamydia. The prevalence of chlamydia increased, with rates from 110.0 per 100,000 in 2000 to 211.0 per 100,000 in 2004. Over the period 2000 to 2004, chlamydia was found to be most prevalent among those 20 to 24 years of age. Females in Ottawa County were more likely to be diagnosed with Chlamydia than males.
- ✓ Gonorrhea (134 per 100,000) and syphilis (0.41 per 100,000) were stable in Ottawa County from 2000 to 2004. Gonorrhea was more frequently diagnosed among the age group 20 to 24 years old, followed by those 25 to 29 years of age. In Ottawa County gonorrhea was found to be most prevalent among females.

## MATERNAL, INFANT AND CHILD HEALTH

The health of mothers, infants and children is of critical importance, both as a reflection of the current health status of the community and as a predictor of the health of the next generation. The following measures will be used to assess the health of mothers, infants and children: live birth rate, mortality measures, birth outcomes and maternal characteristics.

### Live Births



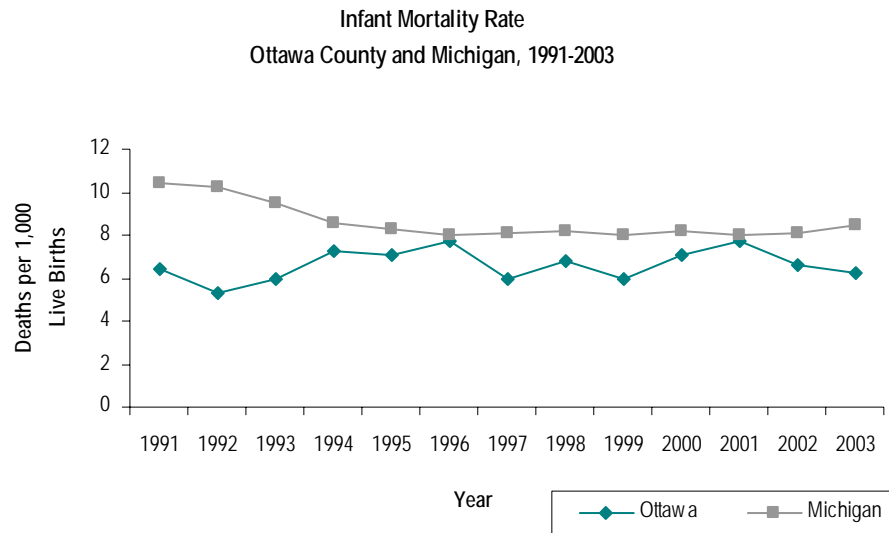
Number and Estimated Rate of Live Births and Pregnancies by Age of Woman  
Ottawa County, 2003

| Age of Woman | Live Births |             | Pregnancies      |                |
|--------------|-------------|-------------|------------------|----------------|
|              | Number      | Rate        | Estimated Number | Estimated Rate |
| All Ages     | 3,539       | 62.3 ± 2.0  | 4,609            | 81.1 ± 2.2     |
| 15-19        | 235         | 21.2 ± 2.7  | 357              | 32.3 ± 3.3     |
| 20-29        | 1,941       | 102.5 ± 4.4 | 2,524            | 133.3 ± 4.8    |
| 30-39        | 1,294       | 75.7 ± 4.0  | 1,628            | 95.2 ± 4.4     |
| 40 & Over    | 68          | 7.0 ± 1.7   | 96               | 9.9 ± 2.0      |

- ✓ Ottawa County, from 1992 to 2002, had a higher rate of live births than Michigan. In 2003 the live birth rate was 62.3 per 1,000 females 15 to 44 years and Michigan was 61.6 per 1,000 females 15 to 44 years.
- ✓ In 2003, the live birth rate for Ottawa County was highest for females 20 to 29 years old (102.5 per 1,000) followed by females aged 30 to 39 years old (75.7 per 1,000).
- ✓ Females in Ottawa County age 40+ (7.0 per 1,000) had the smallest live birth rate.

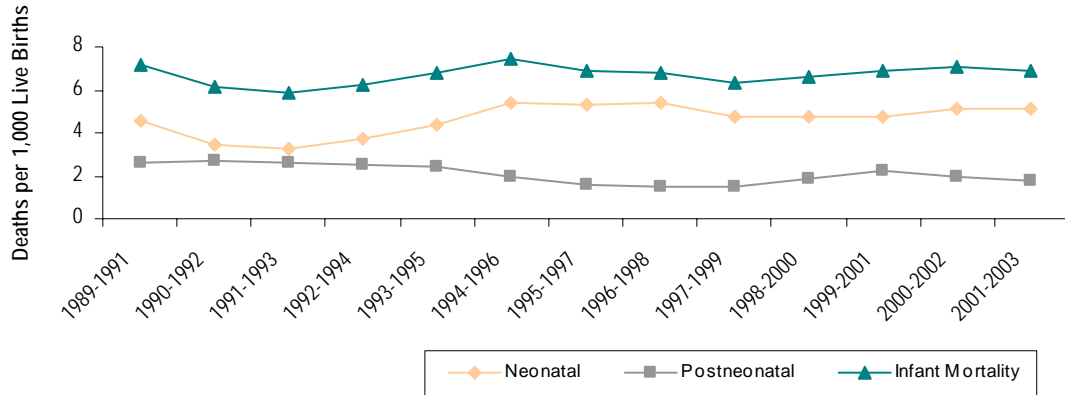
- ✓ In 2003, the total live births in Ottawa County were 3,539 out of 4,609 estimated pregnancies. Approximately 95% of these live births were to white females, 3% were to Asian and Pacific Islander, 1.4% to Blacks and 0.4% were to American Indians.

## Birth Outcomes



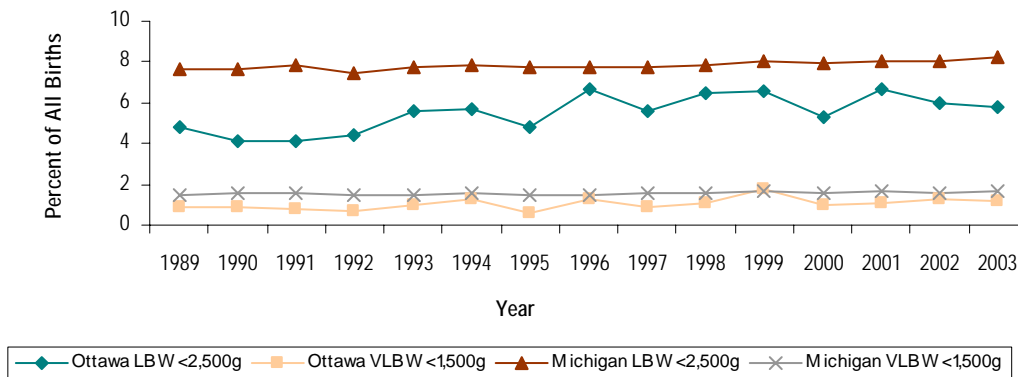
- ✓ The graph above indicates that over the period of 12 years, the risk of infant death was higher for all Michigan infants than Ottawa County infants. In 2004 the infant mortality rate for Ottawa County was 5.1 per 1,000 live births, while Michigan had a rate of 7.6 per 1,000 live births.
- ✓ The trend over the past 15 years indicated a decline in the infant mortality rate for Ottawa County. In 1989 the infant mortality rate was 8.7 per 1,000 live births, and has decreased to 5.1 per 1,000 live births in 2004.
- ✓ The three year moving averages for infant mortality rate from 1992 to 2003 indicated an increase in the rate of infant deaths for the white race. The three year moving average for infant mortality rate from 1992 to 1994 was 5.8 per 1,000 live births and increased to 6.8 per 1,000 live births in 2001 to 2003.

Three Year Moving Averages for  
Neonatal, Postneonatal and Infant Mortality Rates  
Ottawa County, 1989-2003



- ✓ In Ottawa County from 1989 to 2003, the rate of death to infants within the first 27 days of life was higher than the rate of death occurring to infants at 28 to 365 days of age. The neonatal mortality rates in Ottawa County gradually increased while the postneonatal rates declined. Ottawa County neonatal and postneonatal mortality rates from 1989 to 2003 were below the Michigan neonatal and postneonatal mortality rates.
- ✓ In 2003, neonatal and postneonatal rates were highest amongst whites at 4.5 and 1.4 per 1,000 live births respectively.

Percent of Low Birth Weight (LBW) and Very Low Birth Weight (VLBW) Ottawa County  
and Michigan, 1989-2003

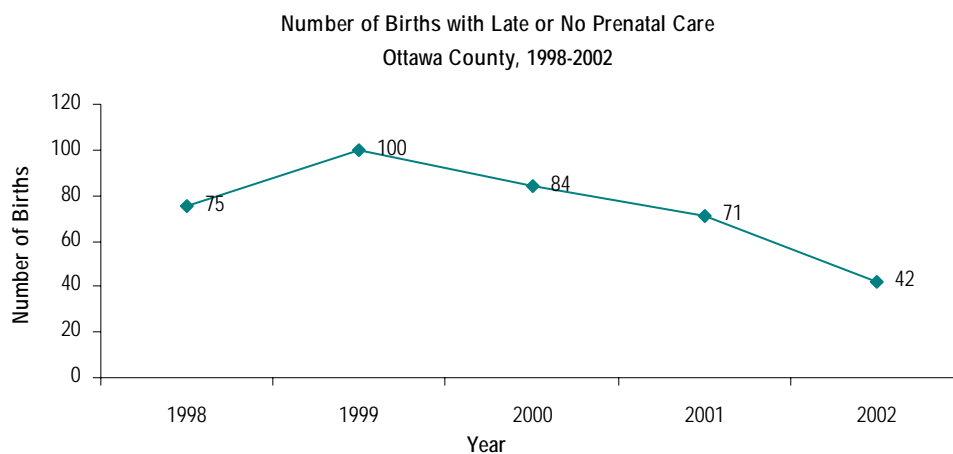


- ✓ From 1989 to 2003, Ottawa County had a lower percentage of births that were low birth weight (LBW < 2500grams) and very low birth weight (VLBW < 1,500 grams) compared to Michigan.



- ✓ In 2003, Ottawa County had 9.7% of live births as preterm births followed by 5.8% of LBW births and 1.2% VLBW births compared to 11.2% preterm births, 8.2% LBW births and 1.7% VLBW births in Michigan.
- ✓ In 2003, the mean birth weight in Ottawa County was 3,415.6 grams (7 pounds 8 ounces) and the median birth weight was 3,459.0 grams (7 pounds 10 ounces).
- ✓ The trend for VLBW births in Ottawa County rose from 0.9% in 1989 to 1.3% in 2004 with fluctuation occurring between the years. The trend for LBW also increased from 4.8% in 1989 to 6.5% in 2004 with fluctuation occurring between the years. The data also indicated that the percentage of non-singleton births increased from 2.4% in 1989 to 3.9% in 2004. This could have contributed to the increased percentage of LBW and VLBW infants.
- ✓ In 2003, 94.2% of total births that were LBW were to white mothers followed by 4.3% to other races and 1.4% to black mothers.
- ✓ In 2002, Ottawa County was ranked 11<sup>th</sup> out of 83 counties in Michigan for the percent (6%) of LBW babies born in the county. Ottawa County was ranked 20<sup>th</sup> for the percent (10%) of preterm births in the county. Note a ranking of 1 indicates the county has a lower rate of LBW or preterm births than the other counties.

## Maternal Characteristics



- ✓ In Ottawa County, the five year trend of number of births with late or no prenatal care declined. In 2003, 90% of live births received prenatal care during first trimester, while 84.1% received prenatal care in the first trimester in Michigan.
- ✓ In 2002, Ottawa County was ranked 1 out of 83 counties in the state for the percent of births with late or no prenatal care. Note a ranking of 1 indicates the county has a lower rate of births with late or no prenatal care compared to other counties.

**Live Births With Prenatal Care Beginning in the First Trimester  
by Age and Ethnicity of Mother  
Ottawa County, 2002**

| Age of Mother | All Births                                 |              |         | Hispanic Ancestry                          |              |         |
|---------------|--------------------------------------------|--------------|---------|--------------------------------------------|--------------|---------|
|               | Births with 1 <sup>st</sup> Trimester Care | Total Births | Percent | Births with 1 <sup>st</sup> Trimester Care | Total Births | Percent |
| < 15          | 2                                          | 4            | 50.0    | -                                          | -            | -       |
| 15-19         | 198                                        | 262          | 75.6    | 50                                         | 68           | 73.5    |
| 20-24         | 668                                        | 773          | 86.4    | 131                                        | 158          | 82.9    |
| 25-29         | 1,025                                      | 1,109        | 92.4    | 112                                        | 124          | 90.3    |
| 30-34         | 875                                        | 954          | 91.7    | 59                                         | 73           | 80.8    |
| 35-39         | 301                                        | 321          | 93.8    | 30                                         | 34           | 88.2    |
| 40 & Over     | 40                                         | 49           | 81.6    | 3                                          | 5            | 60.0    |
| All Ages      | 3,109                                      | 3,472        | 89.5    | 385                                        | 462          | 83.3    |

- ✓ In Ottawa County, at least 50% of all births to all age groups in 2002 received prenatal care in the first trimester. In 2002, 95% of all births to white mothers received prenatal care in the first trimester and 84.2% of all births to black mothers received prenatal care in the first trimester.

**Live Births by Level of Prenatal Care  
Ottawa County, 2003**

| Level of Care<br>(Kessner Index) | Total Births |         |
|----------------------------------|--------------|---------|
|                                  | Number       | Percent |
| Adequate                         | 3,021        | 85.4    |
| Intermediate                     | 430          | 12.2    |
| Inadequate                       | 79           | 2.2     |
| Total                            | 3,539        | 100.0   |

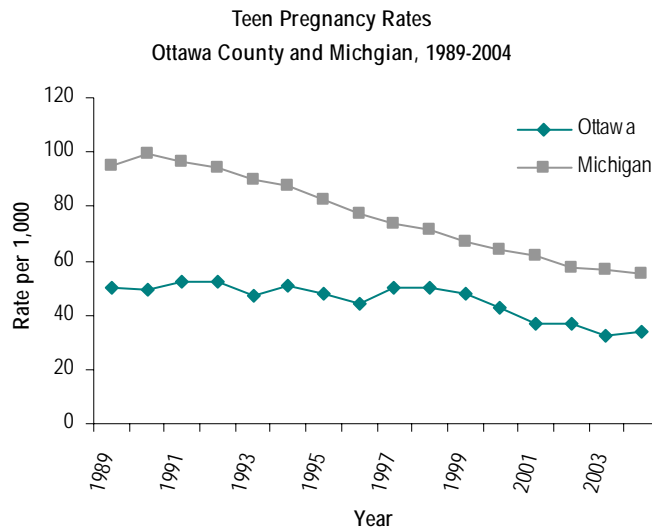
- ✓ According to the Kessner Index for level of prenatal care, Ottawa County had a higher percentage of births that received adequate prenatal care (85.4%) compared to Michigan (78.4%). Michigan had a higher percent of births in 2003 that received inadequate prenatal care (7.4%) compared to Ottawa County (2.2%). In Ottawa County, 12.2% of births received intermediate prenatal care, while 13.8% received the same level of care in Michigan.
- ✓ In 2002, 83.7% of births to white mothers received adequate prenatal care and 78.9% of births to black mothers received adequate prenatal care.
- ✓ In 2003, 10.1% of births that received inadequate prenatal care had a birth outcome of low birth weight, 6.0% of births that received intermediate prenatal care had a birth outcome of low birth weight and 5.7% of births that received adequate prenatal care had a birth outcome of low birth weight in Ottawa County.

**Selected Birth Characteristics  
Ottawa County, 2003**

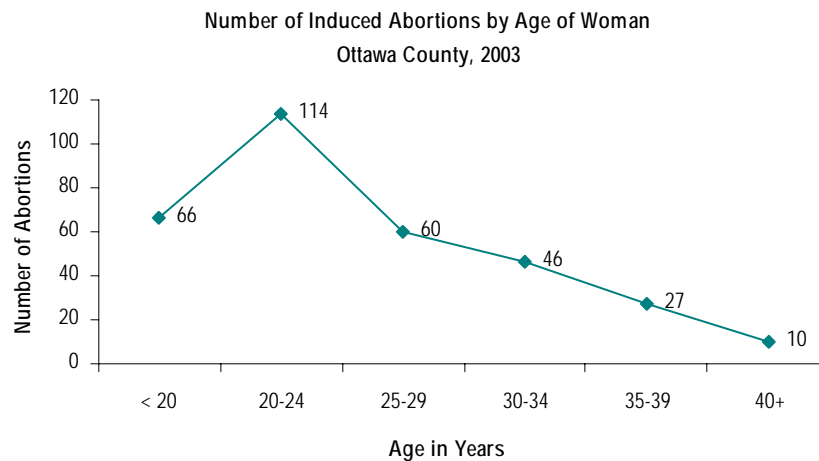
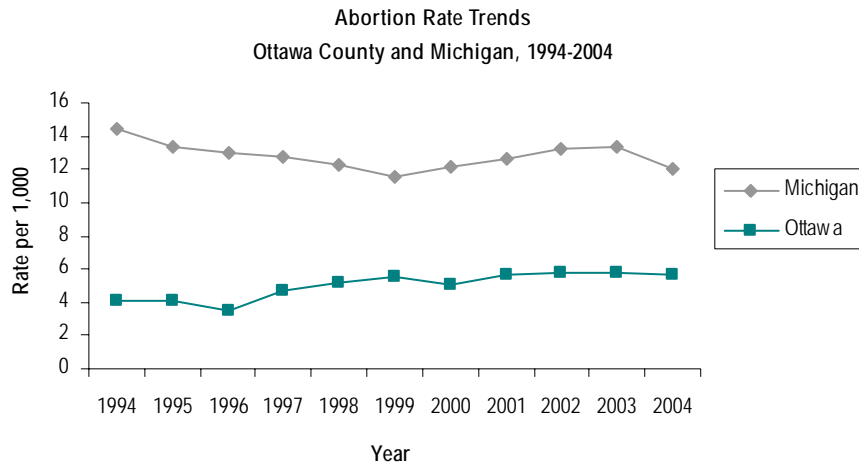
| Maternal Characteristics                                | Percent |          |
|---------------------------------------------------------|---------|----------|
|                                                         | Ottawa  | Michigan |
| < 20 Years of Age                                       | 6.7     | 9.5      |
| First Births                                            | 37.8    | 39       |
| Fourth & Higher Order Births                            | 9.5     | 11.4     |
| < 12 Years of Education                                 | 12.2    | 16.9     |
| % Cesarean Delivery                                     | 26.7    | 26.3     |
| Weight Gained While Pregnant < 16 Pounds                | 8.9     | 11.8     |
| Smoked While Pregnant                                   | 6.9     | 14.4     |
| Unmarried                                               | 19.1    | 34.6     |
| Received Prenatal Care During 1 <sup>st</sup> Trimester | 90      | 84.1     |

- ✓ In 2003, pregnant women in Ottawa County were less likely to smoke (6.9%) compared to pregnant women in Michigan (14.4%). The trend from 1998 to 2003 indicated that the percentage of women who smoked while pregnant decreased from 9% in 1998 to 6.9% in 2003.
- ✓ In 2002, Ottawa County was ranked 3<sup>rd</sup> out of 83 counties in the state for the percent of live births (8%) born to mothers who smoked during pregnancy. There were 265 live births born to mothers who smoked during pregnancy in Ottawa County in 2002. Note a ranking of 1 indicates the county had fewer births to teens than other counties.
- ✓ In 2003, births to teens under age 20 years in Ottawa County (6.7%) were less than births to same age group in Michigan (9.5%). The trend from 1998 to 2003 indicated that the percentage of births to teens under age 20 is decreased from 9% in 1998 to 6.7% in 2003.
- ✓ In 2002, Ottawa County was ranked 17<sup>th</sup> out of 83 counties in Michigan for the percent of live births (13%) born to mothers with less than 12 years of education. There were 466 live births born to mothers with less than 12 years of education in Ottawa County in 2002. Note a ranking of 1 indicates the county had a lower rate of births to mothers with less than 12 years of education than other counties.

## Family Planning



- ✓ The teen pregnancy rate in Ottawa County in 2003 was 32.3 per 1,000 females ages 15 to 19 years. The Michigan rate for the same year was 56.9 per 1,000 females ages 15 to 19 years.
- ✓ The teen pregnancy rate in Ottawa County and Michigan decreased. The rates for Ottawa County declined from 50.0 per 1,000 females ages 15 to 19 years in 1989 to 33.6 per 1,000 females ages 15 to 19 years in 2004.
- ✓ In 2003, 93.6% of the teen pregnancy births were to white mothers, 3.4% were to black mothers and 3.0% were to Asian and Pacific Islander mothers.
- ✓ In 2002, Ottawa County was ranked 7<sup>th</sup> out of 83 counties in Michigan for the percent of live births (7%) born to teenagers under 20 years. There were 254 live births born to teenagers under 20 years in Ottawa County in 2002. Note a ranking of 1 indicates the county had a lower rate of births to teens than other counties.
- ✓ In 2002, 16% of the total teen births in Ottawa County were repeat teen births (second or third births to teens). Of the same year in Michigan, 20% were repeat teen births.
- ✓ In 2002, Ottawa County was ranked 21<sup>st</sup> out of 83 counties in the states for the percent of repeat (second and third births) live births (16%) born to teenagers age 15 to 19 years old. There were 40 repeat live births born to teenagers 15 to 19 years old in Ottawa County in 2002. Note a ranking of 1 indicates the county had a lower rate of repeat births to teens than other counties.
- ✓ In Ottawa County, the trend of “birth by unwed mother” increased from 16.5% in 1995 to 20.2% in 2002. In 2003, 19.1% of births were to unwed mothers in Ottawa County compared to 34.6% births to unwed mothers in Michigan in the same year.
- ✓ In 2002, Ottawa County was ranked 4<sup>th</sup> out of 83 counties in the state for the percent of live births (20%) born to unwed mothers. There were 715 live births born to unwed mothers in Ottawa County in 2002. Note a ranking of 1 indicates the county had fewer births to unwed mothers than other counties.



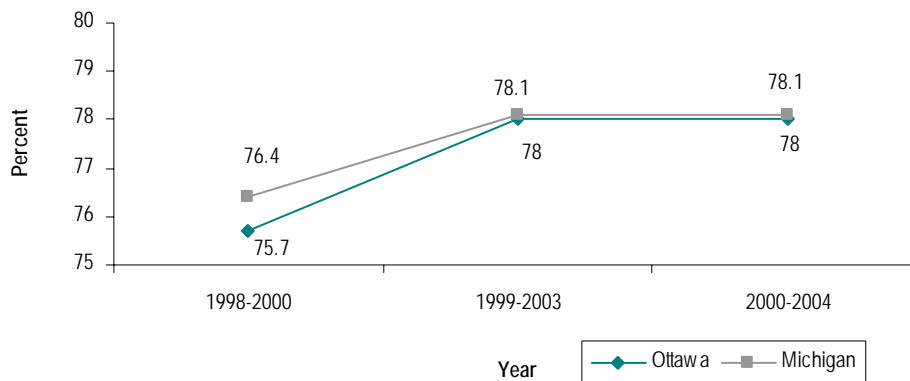
- ✓ The abortion rates declined from 1993 to 1999 but increased after 1999. In Michigan the abortion rates increased from 1997 to 2003.
- ✓ In Ottawa County, women aged 20 to 24 years old reported the highest number of induced abortions followed by those 25 to 29 years old.
- ✓ In 2003, 20.4% of all women who reported induced abortion in Ottawa County had one previous induced abortion, 11.9% had two or more previous induced abortion.

## MODIFIABLE HEALTH RISKS

One determinant of health is lifestyle and health related behaviors. Alcohol, tobacco and other drug use and abuse, obesity, physical activity and the proportion of the population who receive health screenings are indicators of the level of healthy living in a community. The risk factors listed above contributes to chronic disease such as heart disease, cancer, stroke and diabetes as well as injuries. The health screening information provides valuable insight on how well the community is doing to prevent and early detect of disease. Behavioral change is motivated not by knowledge alone, but also by a supportive social environment and availability of facilitative services.

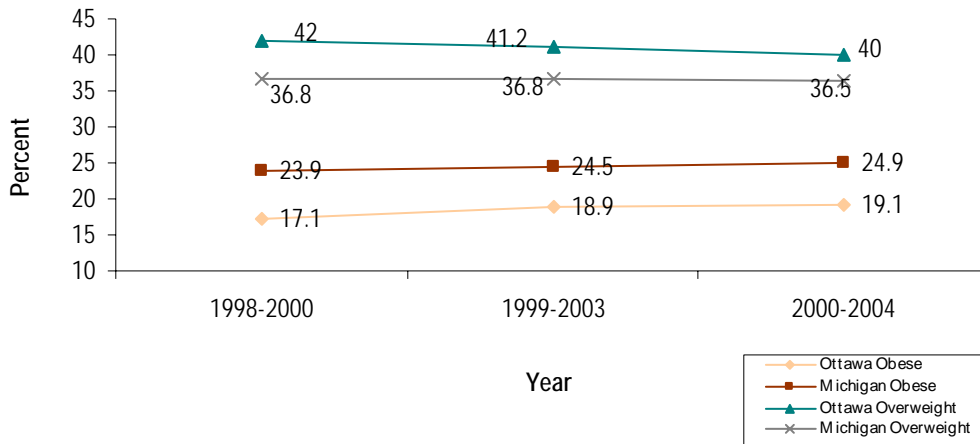
### Nutrition and Overweight

Respondents Who Do Not Consume 5 Servings of Fruits and Vegetables per Day  
Ottawa County and Michigan, 1998-2004



- ✓ From 1998 to 2004, the trend for Michigan and Ottawa County indicated an increase in the proportion of respondents who consume less than five servings of fruits and vegetables per day. The proportion of respondents who consume less than five servings of fruits and vegetables per day was lower in Ottawa County versus Michigan over the same time period.
- ✓ According to the Ottawa County 2004 BRFSS, an estimated 57% of respondents indicated that they did not consume five or more servings of fruits and vegetables. Males were more likely than females to report not consuming five or more fruits and vegetables per day 70% and 47.05% respectively.

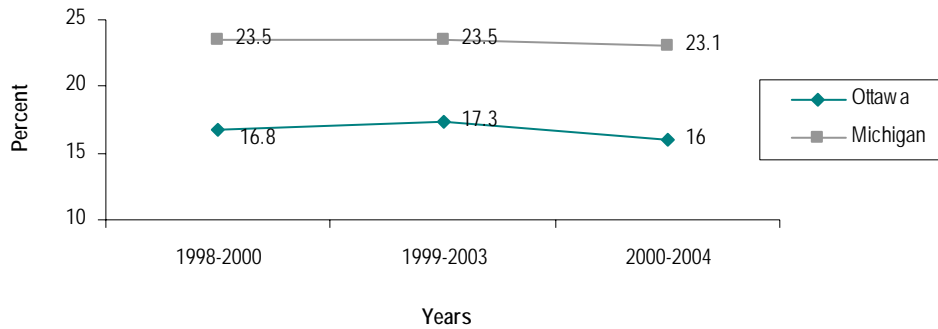
Weight Status Based on BMI Category.  
Ottawa County and Michigan 1998-2004



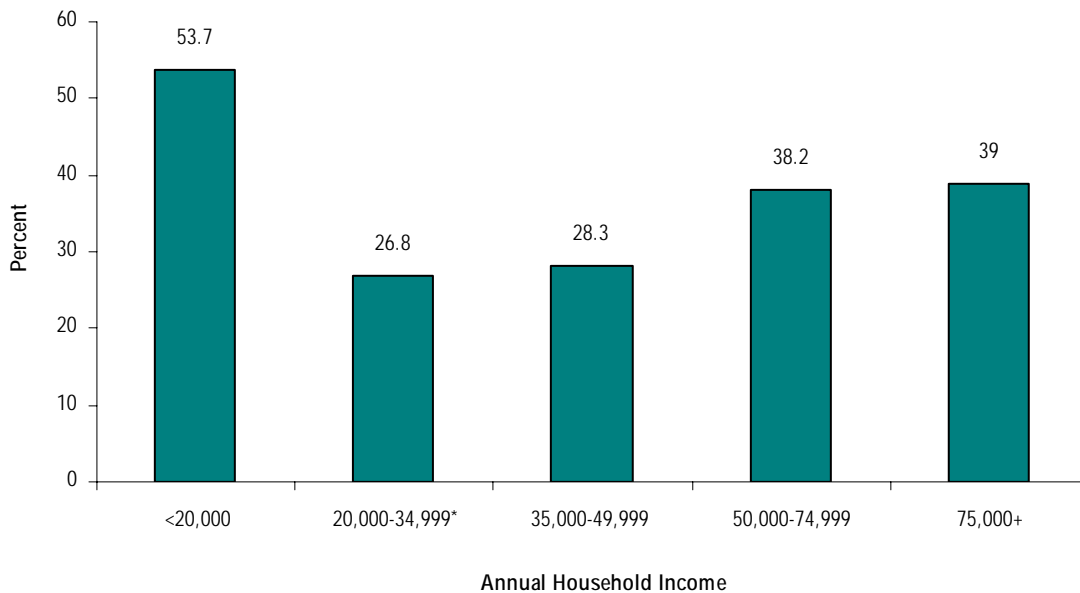
- ✓ From 1998 to 2004, the trends for Michigan and Ottawa County indicated an increase for the proportion of respondents who were classified as obese. Michigan respondents were more likely to be classified as obese compared to Ottawa County respondents over the same time period.
- ✓ From 1998 to 2004, the trends for Michigan and Ottawa County indicated a decrease for the proportion of respondents who were classified as overweight. Ottawa County respondents were more likely to be classified as overweight compared to Michigan respondents over the same time period.
- ✓ According to Ottawa County 2004 BRFS, an estimated 21.6% of respondents were classified as obese. Ottawa County males were more likely to be classified as overweight (49.9%), while Ottawa County females were more likely to be classified as normal weight (51.5%) followed by overweight (27%). Ottawa County males were more likely to be obese (23%) compared to females (19.9%).
- ✓ According to the 2005 Ottawa County Body Mass Index Screening Report, 32% of children 3 to 13 years old screened were classified as *at-risk for becoming overweight* or *overweight*. Females were more likely to be classified as overweight compared to males. Sixth graders were more likely to be classified as overweight compared to third graders and pre-kindergarteners.
- ✓ Fewer county respondents indicated they were trying to lose weight in 2004 than in 1999. An estimated 41.3% in the 2004 BRFS reported they were trying to lose weight compared to 45.7% in 1999 and 45.1% in 1994.

## Physical Activity

No Physical Activity, Recreation or Exercises in Their Leisure Time Within the Past Month.  
Ottawa County and Michigan, 1998-2004



Respondents Reporting Zero Days of Physical Activity per Week by Income  
Ottawa County, 2004

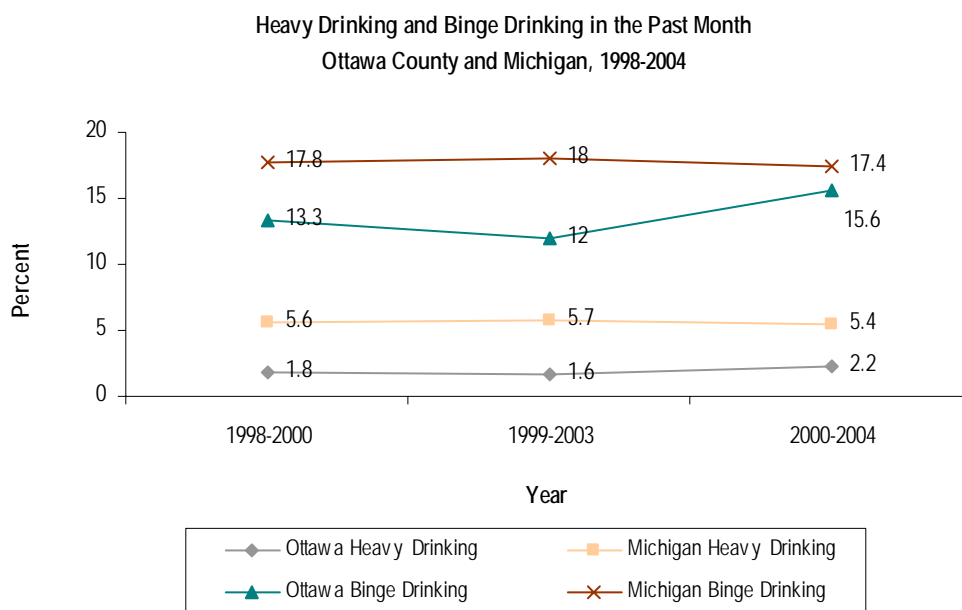


- ✓ From 1998 to 2004, the trends for Michigan and Ottawa County indicated a decrease for the proportion of respondents who indicated that they did not participate in any physical activity, recreation or exercise in their leisure time within the past month. Michigan respondents were more likely to indicate that they have not participated in any physical activity, recreation or exercise in their leisure time within the past month compared to Ottawa County respondents over the same time period.



- ✓ According to the Ottawa County 2004 BRFSS, when asked how many days on average per week were you physically active for less than 30 minutes but at least 10 minutes, respondents with household incomes less than \$20,000 annually were more likely to report zero days of physical activity between 10 and 30 minutes per week compared to those who earn \$20,000 to 49,999 per year.
- ✓ According to the Ottawa County 2004 BRFSS, when asked how many days on average per week were you physically active for at least 30 minutes or more, an estimated 15.6% of respondents indicated that they did not exercise for at least 30 minutes or more at least once per week. Respondents who did not complete high school were more likely than respondents with some college or a higher degree to indicate that they did not exercise for at least 30 minutes or more at least once per week. Respondents age 75+ were more likely to indicate they did not exercise for at least 30 minutes or more at least once per week compared to respondents aged 25 to 64.

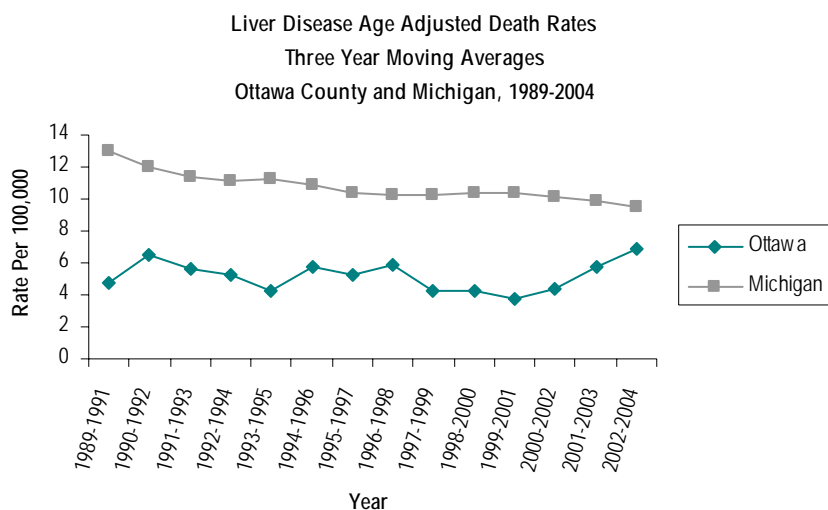
## Substance Abuse



Heavy drinking is the consumption of 60 or more alcoholic drinks in the past month  
Binge drinking is the consumption of five or more drinks on one occasion at least once in the month

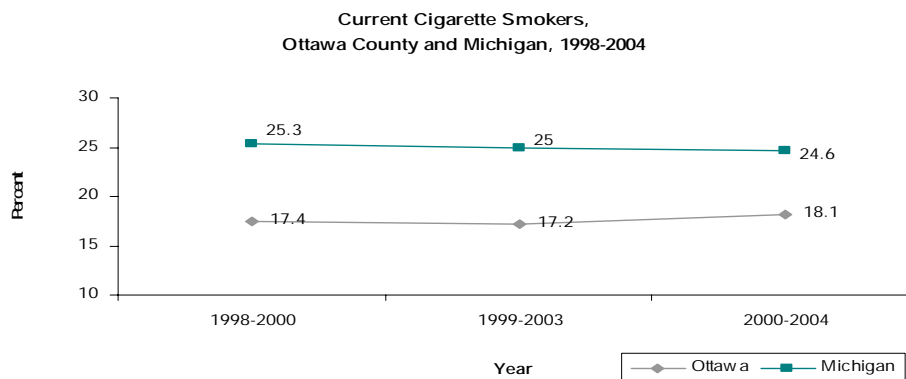
- ✓ From 1998 to 2004, the heavy drinking trend for Ottawa County generally increased. The reverse was observed for Michigan. Michigan respondents were more likely to be heavy drinkers compared to Ottawa County respondents over the same time period.
- ✓ From 1998 to 2004, the binge drinking trend for Ottawa County increased and the trend for Michigan decreased for the same time period. Michigan respondents were more likely to be binge drinkers compared to Ottawa County respondents over the same time period.

- ✓ From 1998 to 2004, both Ottawa County and Michigan had a higher proportion of binge drinkers compared to heavy drinkers.



- ✓ In Ottawa County, the trend of liver disease from 1989 to 2003 indicated an increase trend in last few years. The age adjusted rate increased from 4.8 per 100,000 in 1989 to 5.8 per 100,000 in 2003.
- ✓ According to the Ottawa County 2004 BRFs, an estimated 57.1% of respondents who binge drink indicated that they had driven a motor vehicle within 2 hours of the binge drinking episode.
- ✓ According to the 2004 Ottawa County BRFs, 2.3% of the respondents indicated that they had smoked marijuana in the past six months, 0.5% had used cocaine, 0.1% had used methamphetamine and 0.1% had used LSD in the past month.

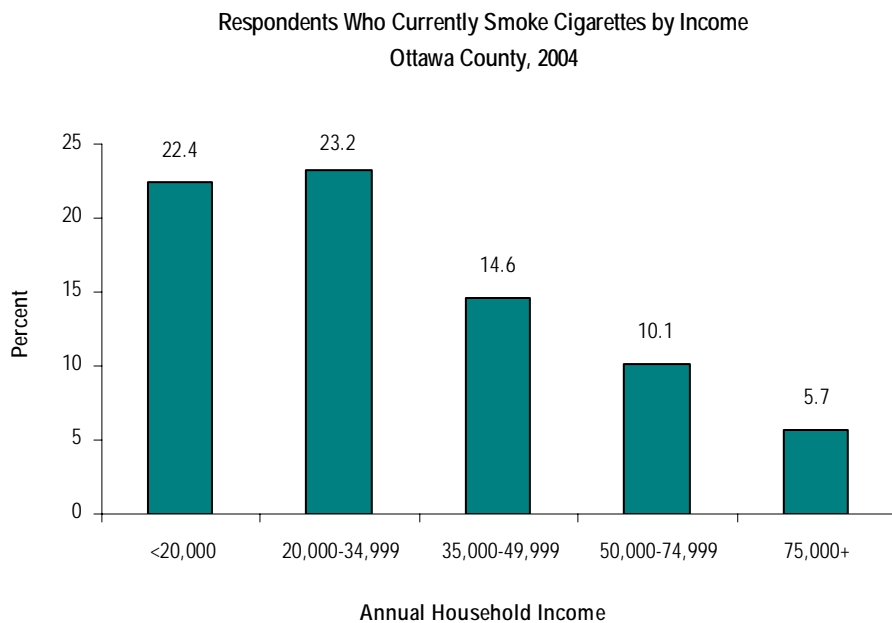
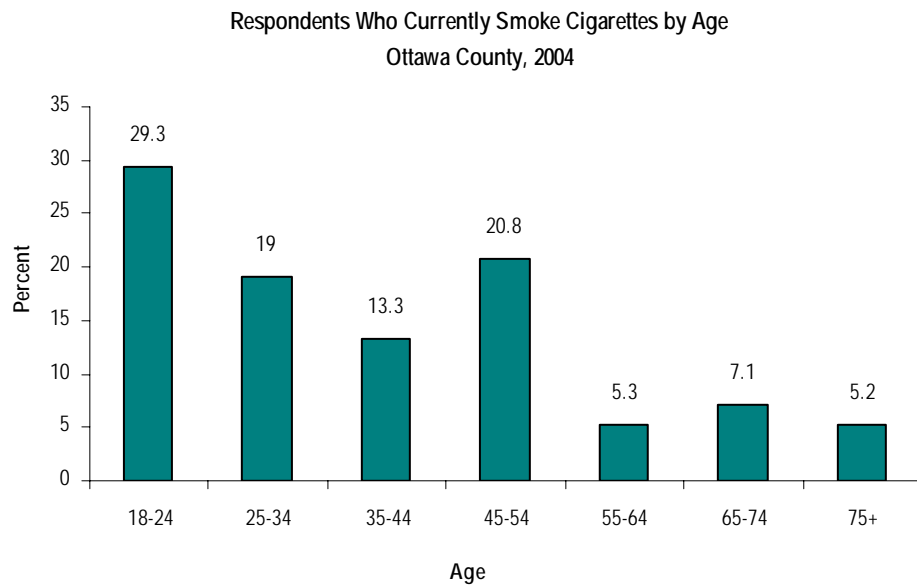
## Tobacco Use



Current smokers are those who reported that they have ever smoked at least 100 cigarettes in their life and that they smoke cigarettes now.

- ✓ From 1998 to 2004, the cigarette smoking trend in Ottawa County indicated that the proportion of respondents who have ever smoked at least 100 cigarettes in their

lifetime and currently smoke increased. Michigan respondents, however, were more likely to have smoked at least 100 cigarettes in their lifetime and currently smoke.

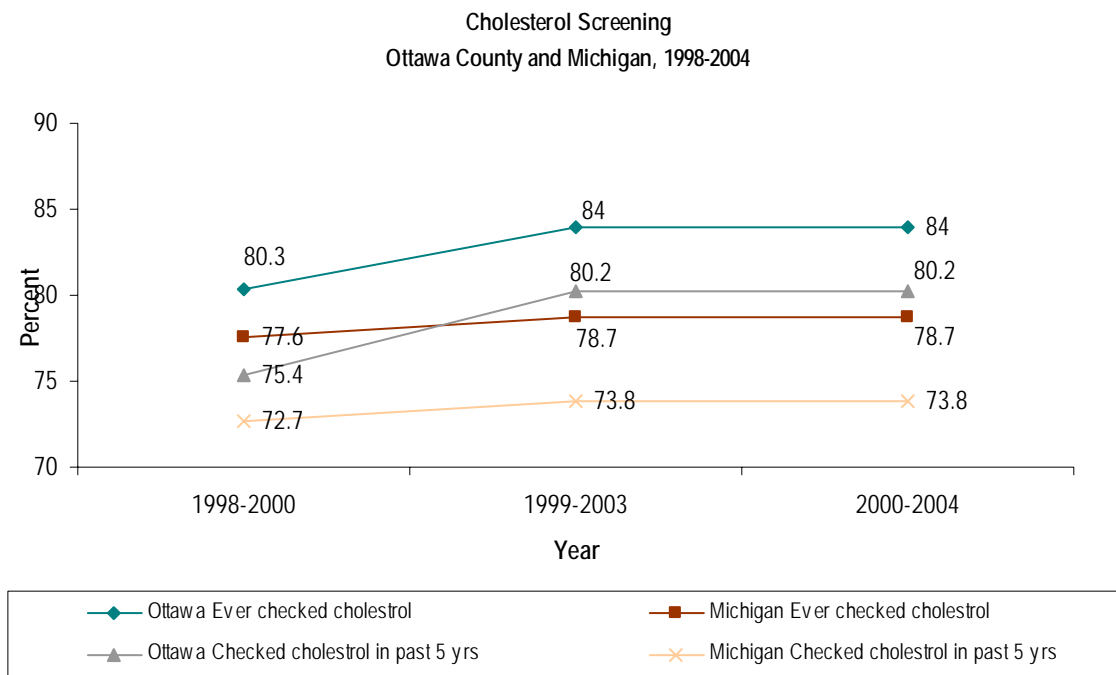


- ✓ According to the 2004 Ottawa County BRFSS, age, income and education were associated with smoking cigarettes. Respondents aged 18 to 34 and 45 to 54 years old were more likely to be current smokers compared respondents 55 years and older. Uninsured respondents were more likely than insured respondents to indicate that they smoked cigarettes. Respondents who did not complete high school, who have

some college education or who have an associate or bachelor degree were more likely to be current smokers compared to those who had education beyond a bachelor degree. Those who earned less than \$20,000 to 34,999 were more likely to indicate they were smokers of cigarettes than those whose incomes were greater than \$75,000 annually.

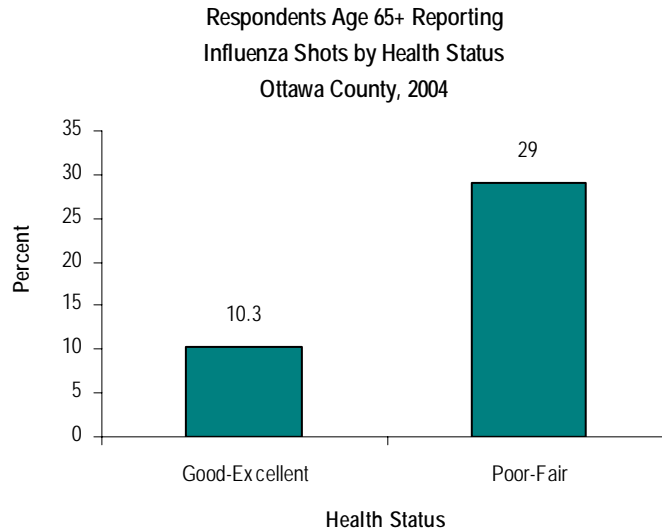
- ✓ In the 2004 Ottawa County BRFSS, respondents were asked about smoking rules in their household. A total of 85.3% of respondents indicated that smoking was not allowed anywhere in their home, while 7.9% of respondents did not have any smoking rules in their home.

## Health Screenings

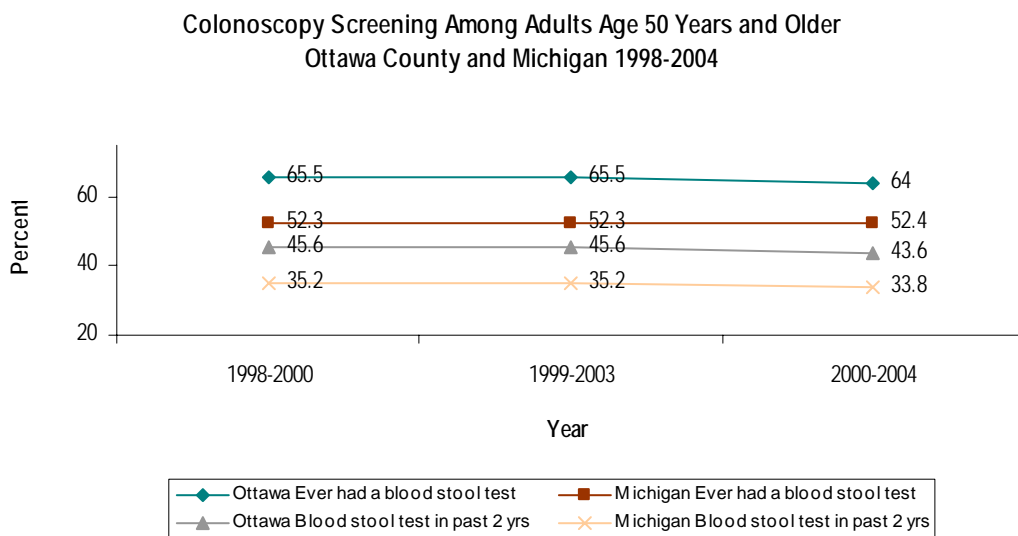


- ✓ From 1998 to 2004, the trends in Ottawa County and Michigan for having ever checked their cholesterol increased and then leveled off. Ottawa County respondents were more likely to indicate that they had ever checked their cholesterol than the state as a whole.
- ✓ From 1998 to 2004, the trend in Ottawa County for having checked their cholesterol in the past five years indicated an increase, while Michigan was stable over the same time period. Ottawa County respondents were more likely to indicate that they have checked their cholesterol in the past five years.

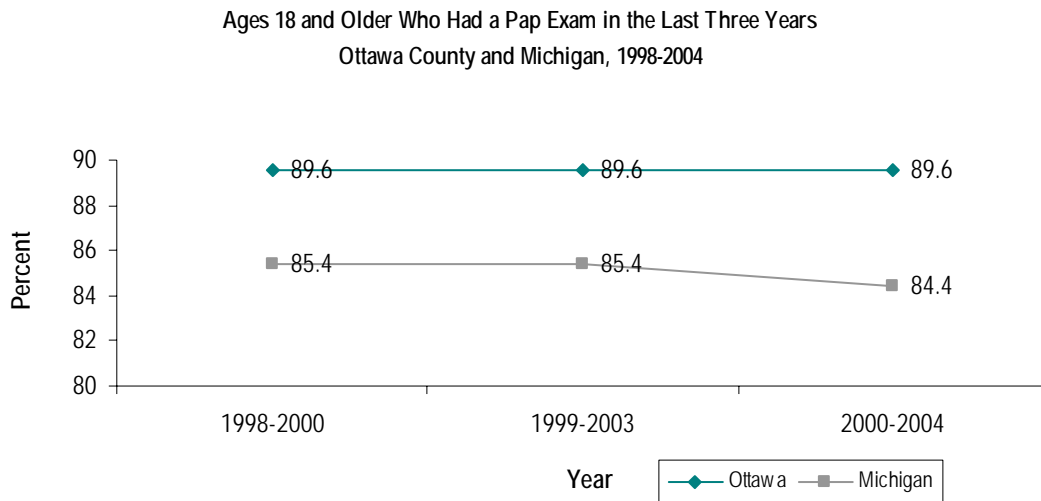
- ✓ From 1998 to 2004, there was an increase in the number of respondents in both Ottawa County and Michigan who were told by a health professional that their cholesterol was high.



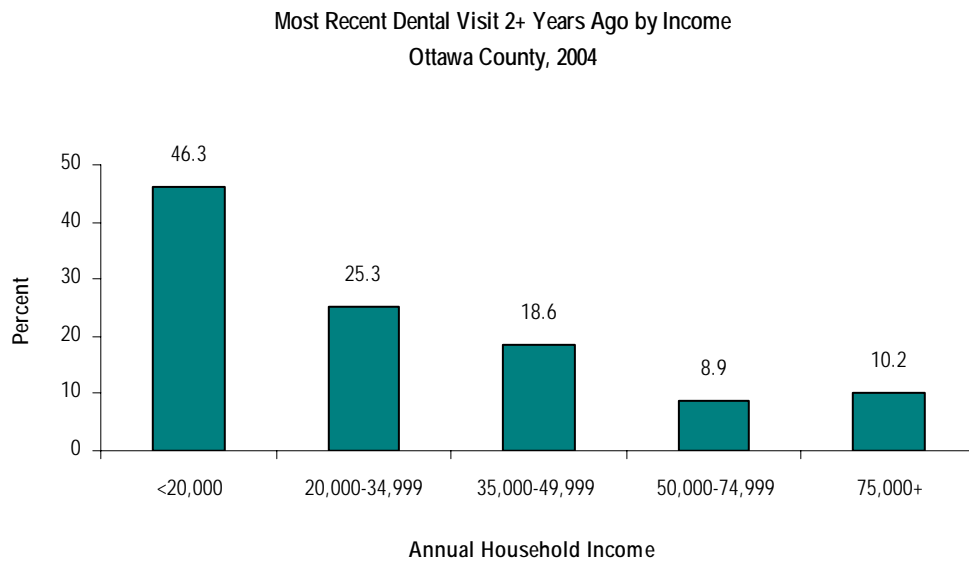
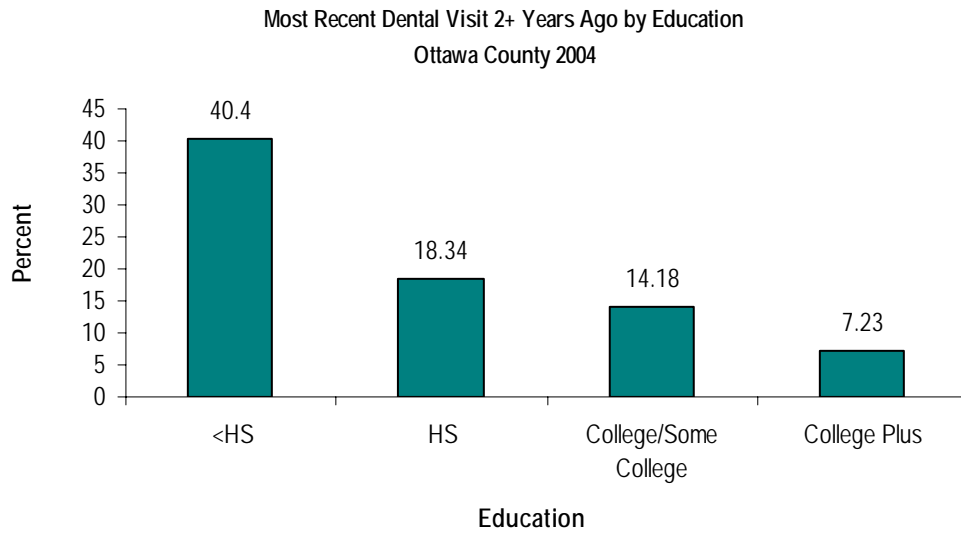
- ✓ According to the 2004 Ottawa County BRFSS, 67.8% of respondents age 65 and older had a flu shot in the past 12 months, while 77.5% of the same age group in Michigan were vaccinated. Of respondents 65 years and older, those who report fair or poor health status were more likely to have received the flu shot in the past 12 months than those over 65 who reported excellent, very good and good health status. Respondents of all age categories who had health insurance were more likely to report getting a flu shot in the past 12 months than all uninsured respondents.



- ✓ From 1998 to 2004, the trend for ever having had a colonoscopy decreased in Ottawa County and increased in Michigan. Ottawa County residents were more likely to indicate that they had ever had a colonoscopy.
- ✓ From 1998 to 2004, the trend for having a colonoscopy in the last two years decreased in both Ottawa County and Michigan. Although, Ottawa County respondents were more likely to indicate having a colonoscopy in the last two years.

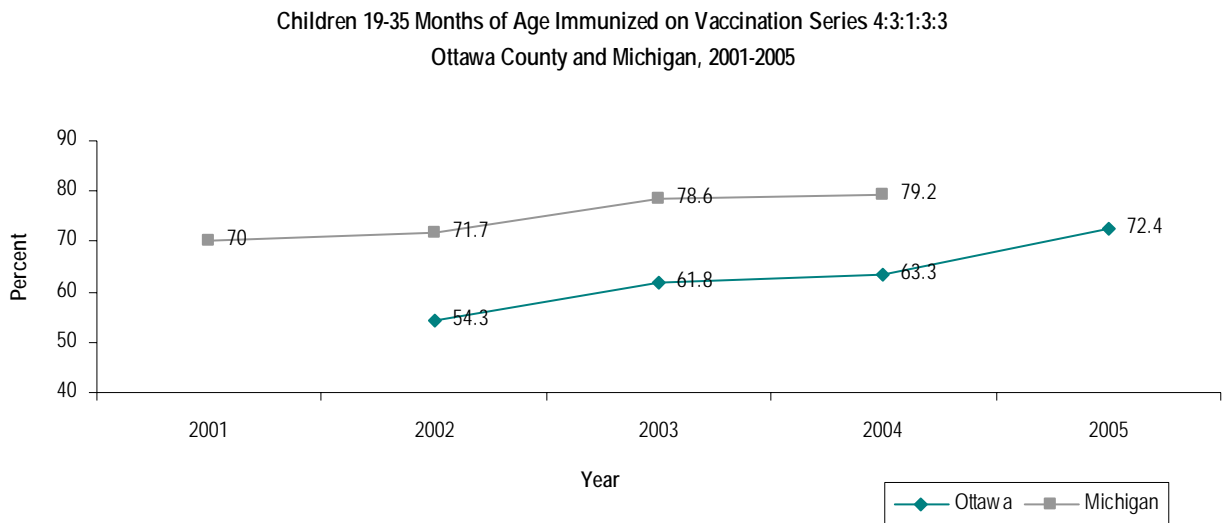


- ✓ From 1998 to 2004, the trend for ever having had a pap test in the last three years decreased in Michigan and remained stable in Ottawa County. Ottawa County residents were more likely to indicate that they had a pap test in the last three years.
- ✓ According to the 2004 Ottawa County BRFS, there was an increase in the number of respondents who indicated that they never had a pap test. In 2004, 6.2% of female respondents reported never having a pap test compared to 4.0% in 1999, 4.4% in 1994.
- ✓ According to the 2004 Ottawa County BRFS, 92.9% (n=14) of pregnant respondents indicated that they took folic acid. Overall 61.7% of female respondents reported taking a vitamin that contained folic acid.



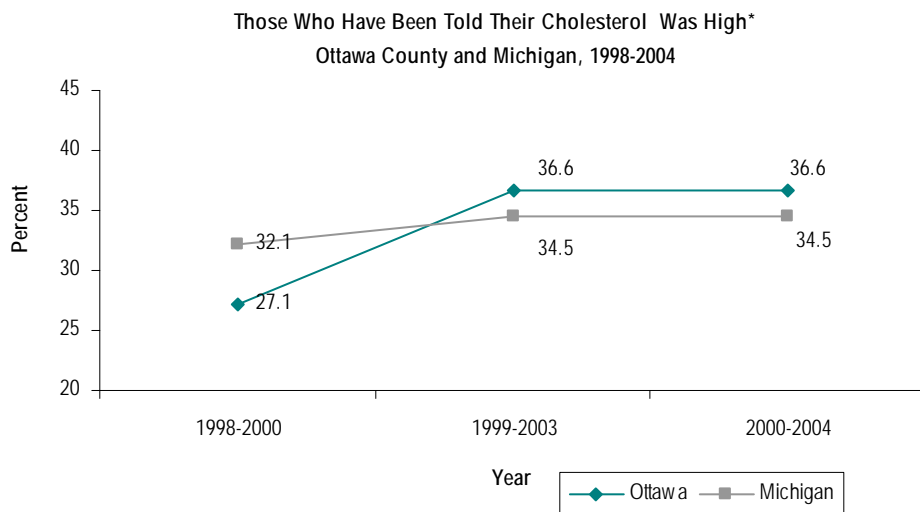
- ✓ According to the 2004 Ottawa County BRFSS, there was an increase in the number of respondents who indicated that they had never been to a dentist. In 2004, 17.3% of Ottawa County respondents reported that they had not been to a dentist in the past year. In 1999, 15.5% had not been to a dentist in the past year.
- ✓ Uninsured Ottawa County respondents were more likely to indicate their last dental visit was two or more years ago compared to insured respondents.
- ✓ Ottawa County respondents with lower educational attainment were more likely to indicate their last dental visit was two or more years ago compared to respondents with higher education.

- ✓ Ottawa County respondents who earned less were more likely to indicate last dental visit two or more years ago compared to respondents with higher incomes.



- ✓ From 2001 to 2005, the immunization trend for children 19 to 35 months of age increased in both Ottawa County and Michigan. Michigan had a higher immunization rate for the same age group compared to Ottawa County.

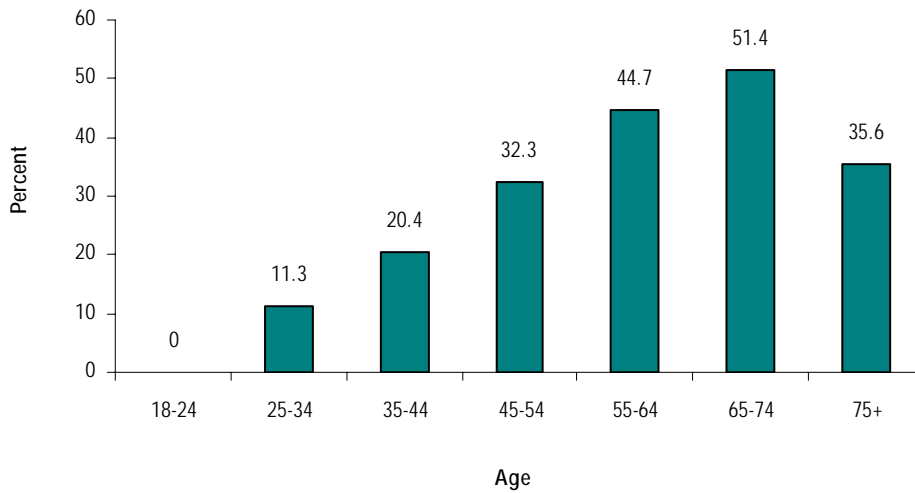
## Cardiovascular Disease Risk Factors



\*Among respondents who reported having had their cholesterol checked.

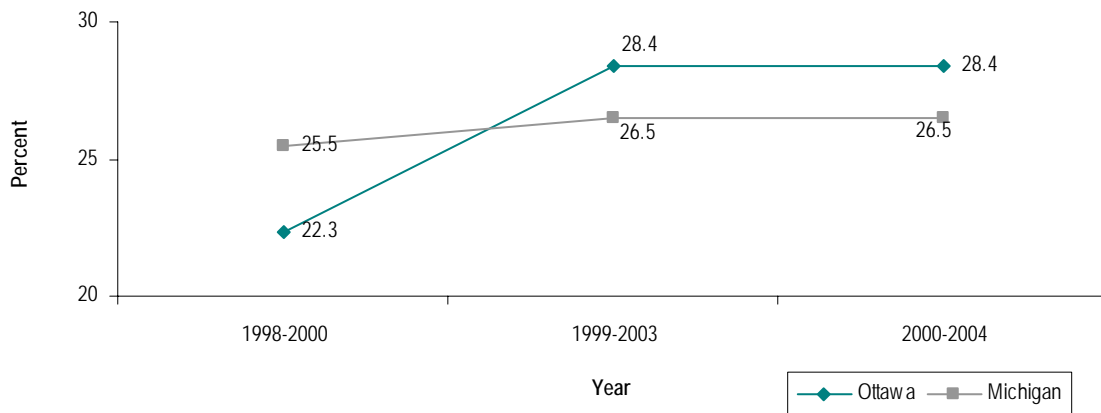


Respondents Reporting High Blood Cholesterol by Age  
Ottawa County, 2004

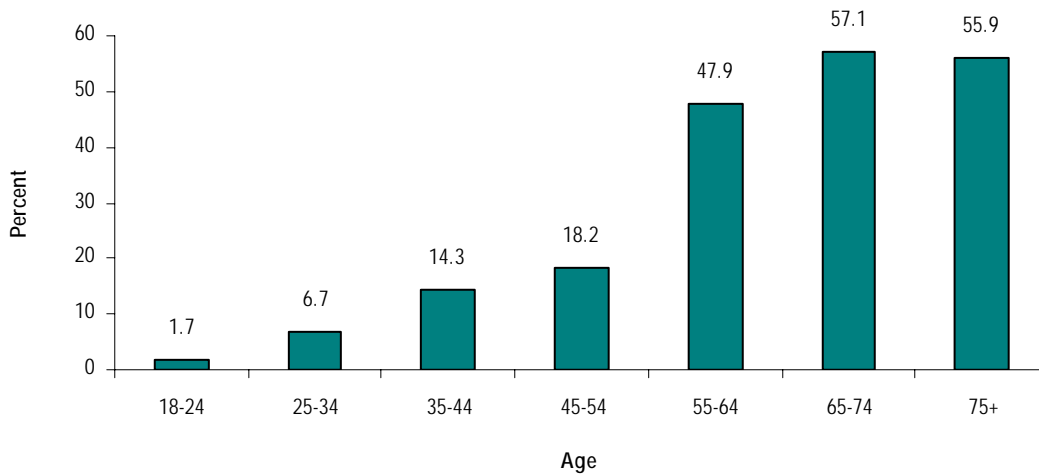


- ✓ From 1998 to 2004, the trend for those who had ever been told by a health professional that their cholesterol was high increased for Ottawa County and Michigan from 1998 to 2003 but remained stable thereafter. Ottawa County residents were more likely to indicate that they had been told by a health professional that they had high cholesterol.
- ✓ According to the 2004 Ottawa County BRFSS, an estimated 26.3% of respondents had been told by a health professional that they had high blood cholesterol compared to 19% in 1999 and 18% in 1994. Younger respondents were less likely to report that they had been told they had high blood cholesterol.

Those Who Have Been Told That Their Blood Pressure Was High  
Ottawa County and Michigan, 1998-2004

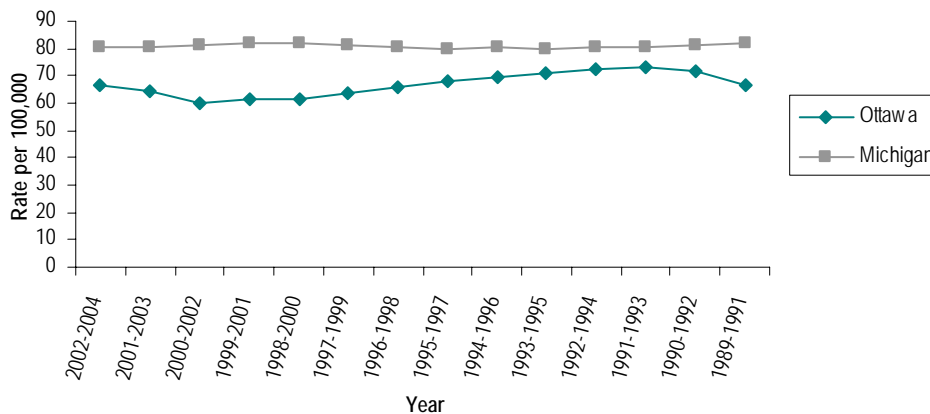


Respondents Reporting High Blood Pressure by Age  
Ottawa County, 2004

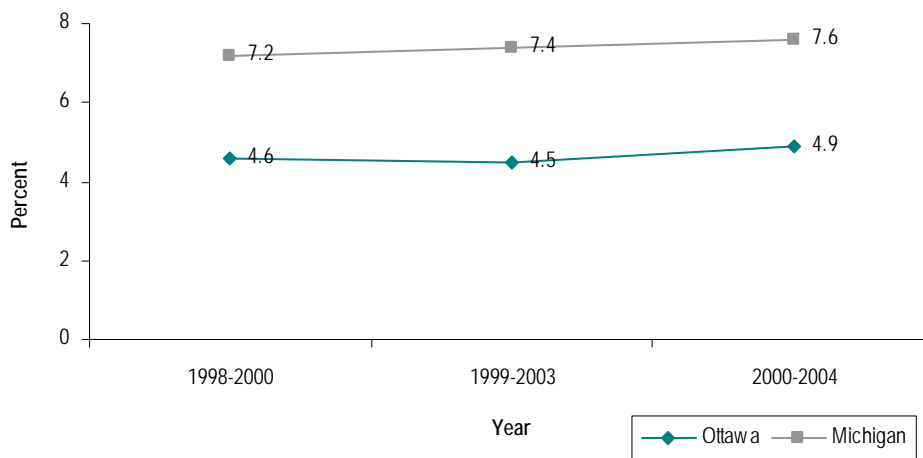


- ✓ From 1998 to 2004, the trend for those who had ever been told by a health professional that their blood pressure was high increased for Ottawa County and Michigan from 1998 to 2003 but has remained stable thereafter. Ottawa County residents were more likely to indicate that they had been told by a health professional that they had high blood pressure.
- ✓ According to the 2004 Ottawa County BRFSS, younger respondents were less likely to report that they had been told they had high blood pressure.

Diabetes Age Adjusted Death Rates  
Three Year Moving Averages  
Ottawa County and Michigan, 1989-2004



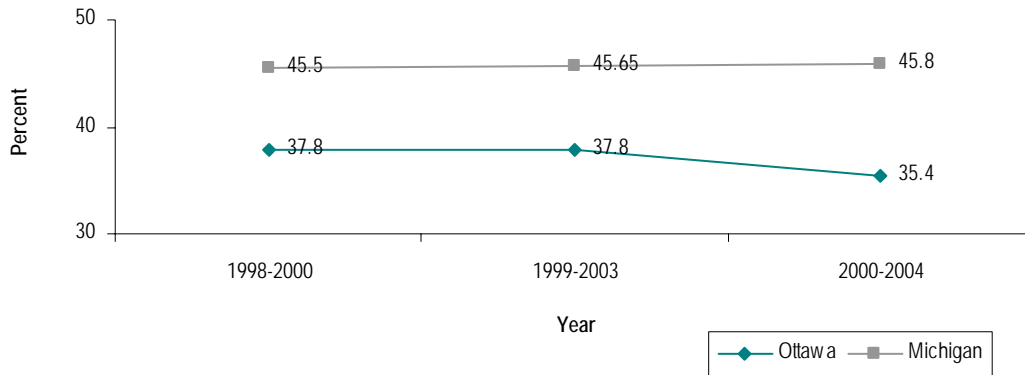
Those Who Have Been Told They Have Diabetes  
Ottawa County and Michigan, 1998-2004



- ✓ Michigan residents were more likely to die from diabetes compared to Ottawa County residents. In the previous years, the age adjusted diabetes death rate for Ottawa County gradually increased.
- ✓ From 1998 to 2004, the trend for those who had ever been told by a health professional that they had diabetes increased for Ottawa County and Michigan. Michigan residents were more likely to indicate that they had been told by a health professional that they had diabetes compared to Ottawa County residents.
- ✓ Diabetes was the 8th leading cause of death in Ottawa County in 2003. According to the 2004 Ottawa County BRFSS, an estimated 8.9% of respondents had been told by their doctor that they had diabetes compared to 4.9% in 1999. Approximately 17.1% of the respondents in the 2004 Ottawa County BRFSS were diagnosed with diabetes while they were pregnant. Respondents aged 35 to 44 years were less likely to indicate that they had been told they had diabetes compared to those 55 years and older. In 2004, females were more likely to be diagnosed with diabetes compared to males.

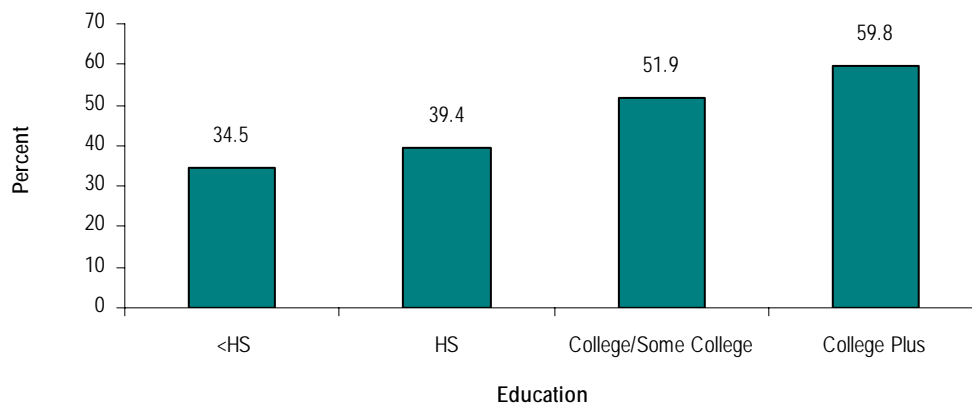
## Responsible Sexual behavior

Ever Been Tested for HIV\*  
Ottawa County and Michigan, 1998-2004



\*Apart from tests that were conducted as part of a blood donation.

Respondents Who Have Been Tested for HIV by Education  
Ottawa County, 2004



- ✓ Michigan residents were more likely to have ever been tested for HIV compared to Ottawa County residents.
- ✓ From 1998 to 2004, the trend for those who had ever been tested for HIV decreased for Ottawa County; however Michigan was stable over the same time period.
- ✓ According to the 2004 Ottawa County BRFS, 47.7% of Ottawa County respondents reported ever having a HIV test compared to 41.8% in 1999.

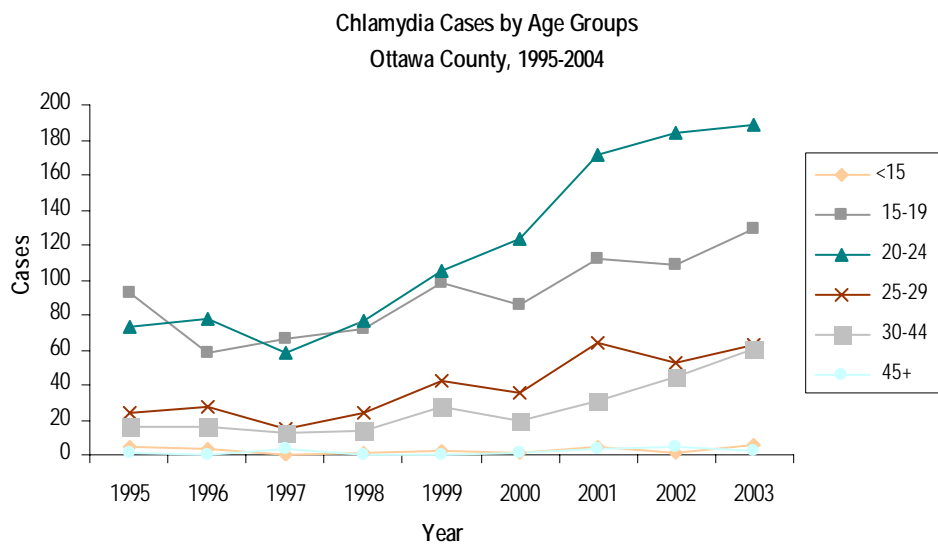
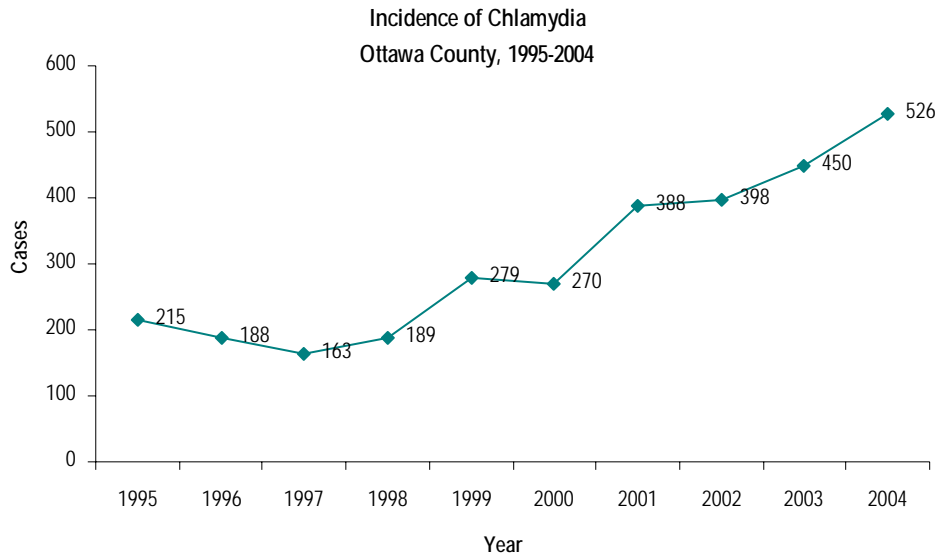
**Estimate of HIV/AIDS Prevalence  
Ottawa County and Michigan, 2001-2004**

| Year | Estimate of HIV/AIDS Prevalence |          | Estimated Prevalence Rate |          |
|------|---------------------------------|----------|---------------------------|----------|
|      | Ottawa                          | Michigan | Ottawa                    | Michigan |
| 2001 | 80                              | 16,200   | 42.6                      | 163.0    |
| 2002 | 100                             | 15,500   | 42.0                      | 156.0    |
| 2003 | 100                             | 15,500   | 42.0                      | 156.0    |
| 2004 | 110                             | 13,500   | 46.2                      | 145.2    |

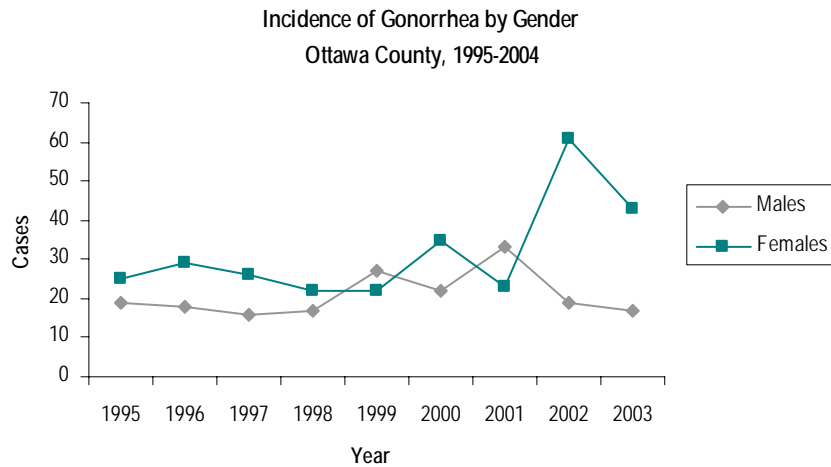
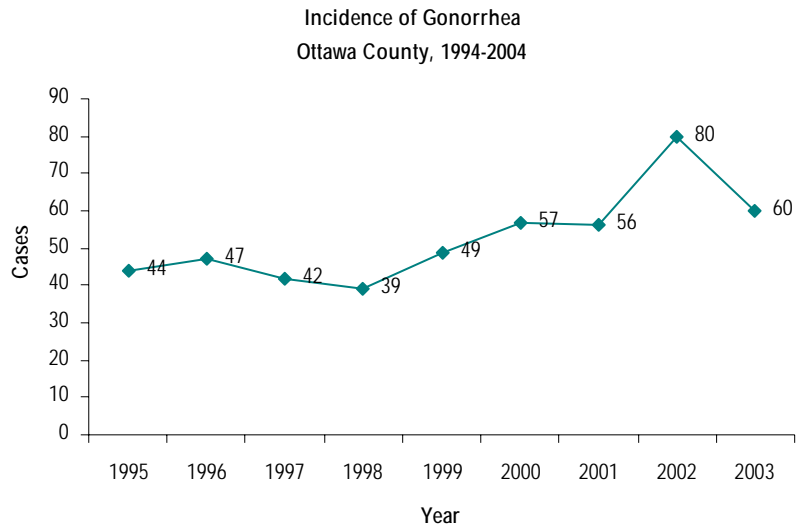
**Estimate of HIV/AIDS Prevalence  
Ottawa County and Michigan, 2001-2004**

| Year | Persons Living With AIDS |          | Persons Living With HIV not AIDS |          | Persons Ever Diagnosed with AIDS to Date |          |
|------|--------------------------|----------|----------------------------------|----------|------------------------------------------|----------|
|      | Ottawa                   | Michigan | Ottawa                           | Michigan | Ottawa                                   | Michigan |
| 2004 | 44                       | 5,645    | 29                               | 5,866    | 101                                      | 13,606   |
| 2003 | 39                       | 5,238    | 26                               | 5,622    | 95                                       | 12,918   |
| 2002 | 38                       | 5,231    | 24                               | 5,569    | 91                                       | 12,232   |
| 2001 | 31                       | 4,844    | 22                               | 5,249    | 81                                       | 11,577   |

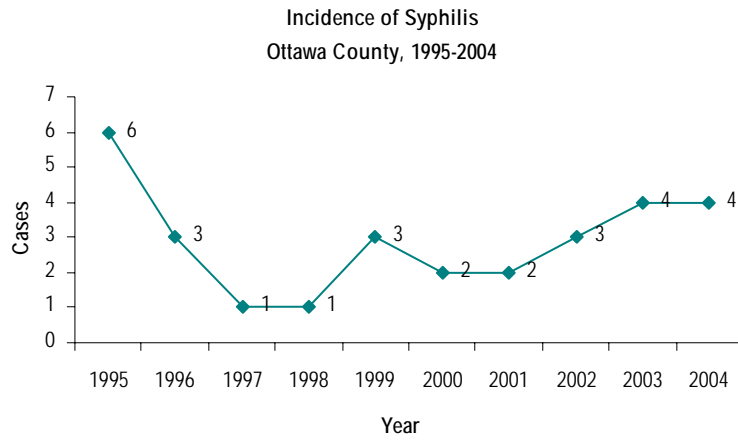
- ✓ Overall in Michigan and Ottawa County the prevalence of HIV/AIDS increased.
- ✓ Of 787 Ottawa County respondents, 1.4% indicated they had been treated for a sexually transmitted or venereal disease in the past year. Less than one percent (0.3%) of 786 respondents had given or received money or drugs in exchange for sex in the past year. Approximately one percent of the 350 male respondents reported that they had sex with another male without a condom in the past year.
- ✓ Ottawa County respondents who did not complete high school were less likely to say that they have been tested for HIV than those with some college, a college degree or college degree plus.



- ✓ Chlamydia in Ottawa County was generally more prevalent among ages 20 to 24 years old, followed by those 15 to 19 years old. In 2003, Ottawa County females were more likely to have Chlamydia than their male counterparts. For all ages in 2003, the female/male ratio for Chlamydia was 2.8 to 1.



- ✓ Gonorrhoea in Ottawa County was generally more prevalent among ages 20 to 24 years old, followed by those 25 to 29 years old. In 2003, Ottawa County females were more likely to have gonorrhoea than their male counterpart. For all ages in 2003, the female/male ratio for Gonorrhoea was 2.3 to 1.



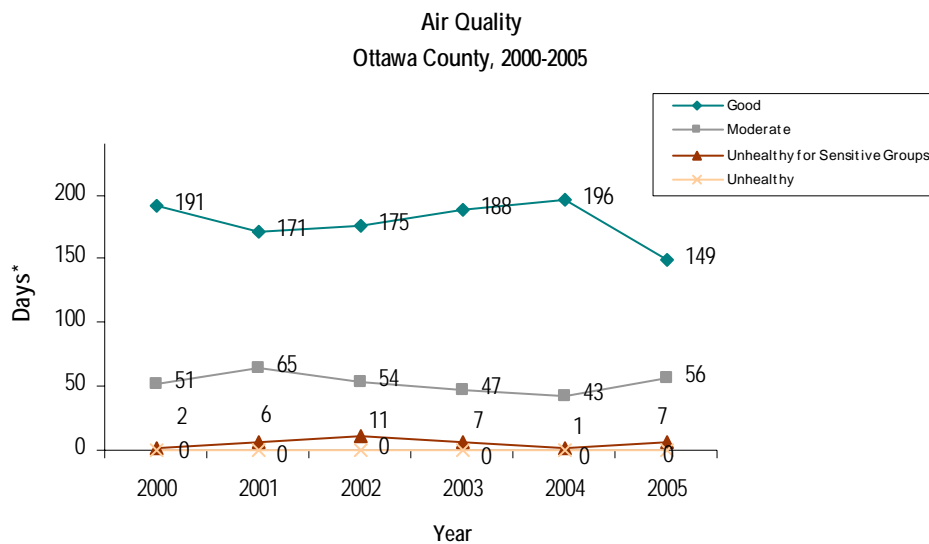
- ✓ Syphilis in Ottawa County was generally more prevalent among ages 25 to 29 years old. In 2003, Ottawa County males were more likely to have syphilis than their female counterpart. For all ages in 2003, the female/male ratio for syphilis was 1 to 4.



## ENVIRONMENTAL HEALTH

The physical environment directly influences the quality of life and plays a central role in human development, health and disease. Exposures to hazardous agents in the air, water, soil and food contribute to illness, disability and death. Preventing exposure to harmful environmental substances is essential to good public health. Setting standards, monitoring, and timely elimination of conditions that exceed recommended guidelines ensure the health of residents and the environment of the community.

### Air Quality



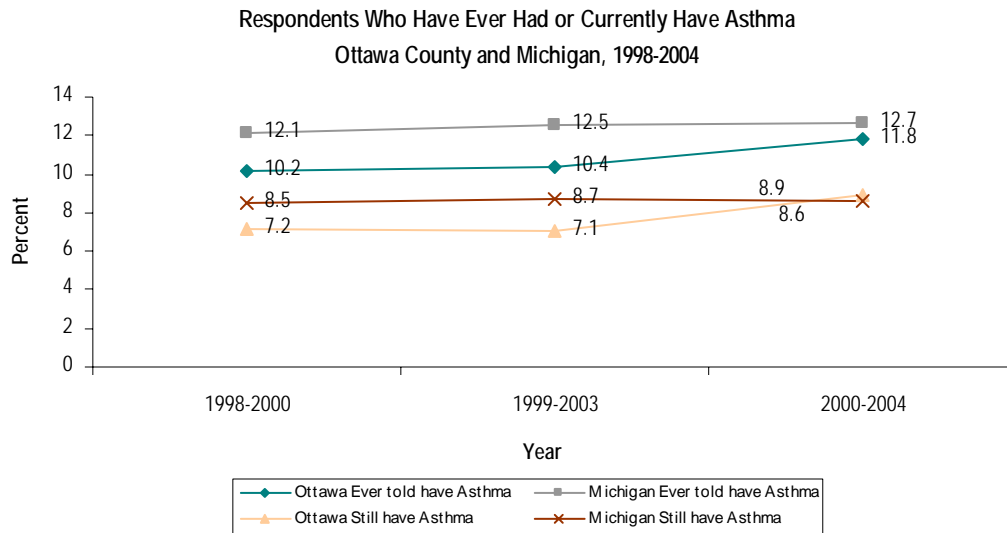
\*Total number of days measured each year was 240.

- ✓ Overall, 74% of the time the air quality index in Ottawa County was rated good.

**Number of Exceedances of EPA Air Quality Standard**  
Ottawa County, 2000-2005

| Air Pollutants                       | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 |
|--------------------------------------|------|------|------|------|------|------|
| Carbon Monoxide                      | 0    | 0    | 0    | 0    | 0    | 0    |
| Nitrogen Dioxide                     | 0    | 0    | 0    | 0    | 0    | 0    |
| Ozone                                | 0    | 1    | 1    | 1    | 0    | 1    |
| Sulfur Dioxide                       | 0    | 0    | 0    | 0    | 0    | 0    |
| Particulate Matter < 2.5 micrometers | 0    | 0    | 0    | 0    | 0    | 0    |
| Particulate Matter < 10 micrometers  | 0    | 0    | 0    | 0    | 0    | 0    |

- ✓ From 2000 to 2005, ozone was the pollutant with the highest air quality index value and thus the pollutant responsible for the highest index value observed for that year. The number of days of elevated ozone concentrations ranged from 157 to 162.



- ✓ From 1998 to 2004, the trends for those who had ever been told they had asthma increased for Ottawa County and Michigan. Michigan residents were more likely to indicate that they had ever been told they had asthma compared to Ottawa County residents.
- ✓ From 1998 to 2004, the trends for those who indicated that they still had asthma increased for Ottawa County and Michigan. Michigan residents were more likely to indicate that they still had asthma compared to Ottawa County respondents.
- ✓ According to the 2004 Ottawa County BRFSS, 18.4% of responding households reported living with at least one child in the home with asthma.

## Water Quality

### Inland Beach Monitoring Ottawa County, 2003-2005

| Beaches                            | 2003<br>N  | 2003<br>EX | 2004<br>N  | 2004<br>EX | 2005<br>N  | 2005<br>EX | Total<br>N | Total<br>EX |
|------------------------------------|------------|------------|------------|------------|------------|------------|------------|-------------|
| Pottawattomie Park                 | 15         | 0          | 13         | 0          | 14         | 0          | 42         | 0           |
| Lakeside Beach                     | 15         | 0          | 13         | 0          | 14         | 0          | 42         | 0           |
| Grose Park                         | 15         | 0          | 14         | 1          | 14         | 0          | 43         | 1           |
| Maplewood Lake Park                | 18         | 3          | 15         | 2          | 14         | 0          | 47         | 5           |
| Georgetown Community Park          | 15         | 0          | 13         | 0          | 14         | 0          | 42         | 0           |
| Holland State Park - Lake Macatawa | 15         | 0          | 13         | 0          | 14         | 0          | 42         | 0           |
| Fallen Leaf Park                   | 0          | 0          | 13         | 0          | 15         | 1          | 28         | 1           |
| Dunton Park                        | 16         | 1          | 17         | 5          | 15         | 2          | 48         | 8           |
| Grand Haven Boaters Park           | 0          | 0          | 16         | 2          | 0          | 0          | 16         | 2           |
| Huizenga Park                      | 0          | 0          | 15         | 3          | 0          | 0          | 15         | 3           |
| <b>Total</b>                       | <b>109</b> | <b>4</b>   | <b>142</b> | <b>13</b>  | <b>114</b> | <b>3</b>   | <b>365</b> | <b>20</b>   |

N= Number of sampling events (3 samples per event).

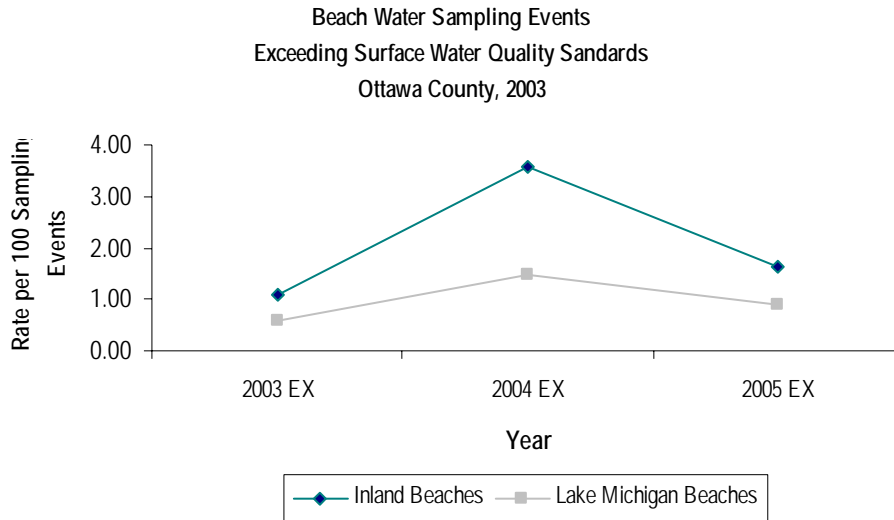
EX = Number of times the level of E. coli exceeded the surface water quality standard of 300 E. coli/100ml of water.

### Lake Michigan Beach Monitoring Ottawa County, 2003-2005

| Beaches                    | 2003<br>N | 2003<br>EX | 2004<br>N  | 2004<br>EX | 2005<br>N  | 2005<br>EX | Total<br>N | Total<br>EX |
|----------------------------|-----------|------------|------------|------------|------------|------------|------------|-------------|
| Holland State Park         | 15        | 0          | 12         | 0          | 13         | 0          | 40         | 0           |
| Tunnel Park                | 15        | 0          | 14         | 1          | 14         | 0          | 43         | 1           |
| Kirk Park                  | 15        | 0          | 13         | 0          | 14         | 0          | 42         | 0           |
| North Beach Park           | 15        | 0          | 16         | 2          | 14         | 0          | 45         | 2           |
| Grand Haven State Park     | 15        | 0          | 13         | 0          | 15         | 1          | 43         | 1           |
| Grand Haven City Beach     | 17        | 2          | 15         | 1          | 14         | 0          | 46         | 3           |
| Rosy Mound Recreation Area | 0         | 0          | 13         | 0          | 16         | 2          | 29         | 2           |
| Kouw Park                  | 0         | 0          | 13         | 0          | 14         | 0          | 27         | 0           |
| Windsnest Park             | 0         | 0          | 14         | 1          | 14         | 0          | 28         | 1           |
| <b>Total</b>               | <b>92</b> | <b>2</b>   | <b>123</b> | <b>5</b>   | <b>128</b> | <b>3</b>   | <b>343</b> | <b>10</b>   |

N= Number of sampling events (3 samples per event)

EX = Number of times the level of E. coli exceeded the surface water quality standard of 300 E. coli/100ml of water.



## Hazardous Waste

**Hazardous Waste Collected  
Ottawa County, 2003-2005**

| Hazardous Waste Collected            | 2003   | 2004   | 2005   |
|--------------------------------------|--------|--------|--------|
| Used Motor Oil (Gallons)             | 6,950  | 6,950  | 10,700 |
| Pesticides (Pounds)                  | 10,094 | 12,488 | 11,502 |
| Mercury and Mercury Devices (Pounds) | 613    | 227    | 271    |
| Electronic Waste (Pounds)            | -      | 38,501 | 51,291 |
| Antifreeze (Gallons)                 | 0      | 440    | 530    |

- ✓ In 2003, a total of 2,853 residents participated in the disposal of household hazardous waste. In 2004, the Ottawa County Health Department opened its Resource Recovery Service Centers. During 2004, participation increased to 6,315 residents followed by 8,466 residents in 2005.

**Respondents Who Recycle Waste Products  
Ottawa County, 2004**

| Percent of respondents who recycle... | %    |
|---------------------------------------|------|
| Newspaper                             | 62.0 |
| Tin/Aluminum                          | 59.6 |
| Plastic                               | 56.0 |
| Phone Books                           | 55.3 |
| Glass                                 | 46.8 |
| Other paper                           | 41.6 |
| Cardboard                             | 41.3 |
| Scrap Metal                           | 24.9 |
| Computer equipment                    | 11.5 |

- ✓ According to the 2004 Ottawa County BRFS, 16.6 % of respondents indicated that they did not recycle any of the above listed products.

**How Respondents Recycle Used Motor Oil  
Ottawa County 2004**

| How do you dispose of used motor oils? | %    |
|----------------------------------------|------|
| Gas Station/Mechanic Shop              | 65.0 |
| No Oil to Dispose                      | 14.3 |
| Local Hazardous Waste Clean-up         | 10.5 |
| Burn                                   | 1.6  |
| Discard into the Trash                 | 1.1  |
| Ground, Soil, Driveway, Road           | .5   |
| Into Drain                             | 0    |
| Other                                  | 4.0  |

- ✓ According to the 2004 Ottawa County BRFS, 65% of respondents indicated that they disposed of the used oil via gas station or mechanic shop.

**How Respondents Recycle Used Tires  
Ottawa County 2004**

| How do you dispose of used tires? | %    |
|-----------------------------------|------|
| Mechanic Shop/Retail Store        | 71.3 |
| No Tires to Dispose               | 16.6 |
| Recycle Center/Event              | 7.0  |
| Store at Home                     | .8   |
| Reuse in a Different Way          | .4   |
| Discard in the Trash              | .4   |
| Burn                              | .3   |
| Other                             | 1.0  |

- ✓ An estimated 71.3% of respondents indicated that they disposed of their used tires via a mechanic or retail shop.

## Food Safety

### Rate per 100,000 of Food Borne Disease Ottawa County 2000-2004

| Disease                         | 2000 | 2001 | 2002 | 2003 | 2004 |
|---------------------------------|------|------|------|------|------|
| <b>Campylobacter</b>            |      |      |      |      |      |
| Ottawa County                   | 8.81 | 13   | 7.97 | 13   | 7.55 |
| Michigan                        | 7.78 | 8.94 | 8.72 | 8.45 | 8.8  |
| <b>Cryptosporidiosis</b>        |      |      |      |      |      |
| Ottawa County                   | 5.03 | 4.61 | 3.35 | 2.51 | 2.93 |
| Michigan                        | 1    | 1.87 | 1.36 | 1.53 | 1.56 |
| <b>Escherichia coli 0157:H7</b> |      |      |      |      |      |
| Ottawa County                   | 3.35 | 4.19 | 1.67 | 2.51 | 1.67 |
| Michigan                        | 1.36 | 1.02 | 1.35 | 0.95 | 0.85 |
| <b>Giardiasis</b>               |      |      |      |      |      |
| Ottawa County                   | 18   | 16   | 13   | 8.81 | 10   |
| Michigan                        | 11   | 10   | 9.25 | 7.73 | 7.41 |
| <b>Salmonellosis</b>            |      |      |      |      |      |
| Ottawa County                   | 10   | 7.55 | 7.97 | 10   | 10   |
| Michigan                        | 8.99 | 8.97 | 8.75 | 8.01 | 8.6  |

- ✓ Overall, the rate of occurrence of food borne illness in Ottawa County was higher than Michigan for all the above listed food borne disease.

### Food Sanitation Critical Restaurant Violations Ottawa County, 2002-2005

| Critical Violations                                             | FY 2002/2003 |         | FY 2003/2004 |         | FY 2004/2005 |         |
|-----------------------------------------------------------------|--------------|---------|--------------|---------|--------------|---------|
|                                                                 | Violations   | Percent | Violations   | Percent | Violations   | Percent |
| 3-301.11 Preventing contamination from hands                    | 27           | 5       | 77           | 12      | 108          | 14      |
| 3-501.16 Potentially hazardous food, hot and cold holding       | 167          | 31      | 205          | 32      | 381          | 51      |
| 3-501.17 Ready-to-eat, potentially hazardous food, date marking | 183          | 34      | 271          | 43      | 390          | 52      |
| 4-601.11 Equipment, food-contact surfaces                       | 457          | 85      | 366          | 58      | 643          | 85      |
| 3-401.11 Raw animal foods                                       | 1            | 0.18    | 0            | 0       | 1            | 0.13    |
| 3-201.11 Compliance with food law                               | 0            | 0       | 1            | 0.15    | 1            | 0.13    |

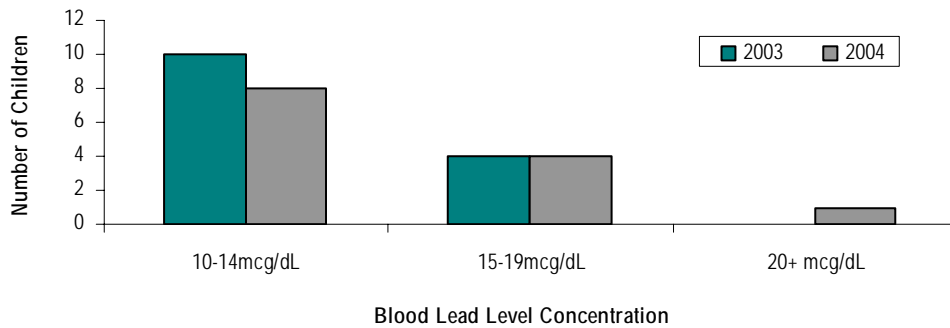
- ✓ In the fiscal year 2004 to 2005, there were 32 compliance conferences held for offending restaurants in Ottawa County. Of the offending food service establishments, 60% (19) sufficiently corrected the risk factors identified during inspection.
- ✓ In Ottawa County, the trend increased for the number of food service personnel trained by the environmental health division within OCHD. In fiscal year 2002 to 2003 115 personnel were trained; in fiscal year 2003 to 2004, 128 were trained; and in fiscal year 2004 to 2005, 342 personnel were trained.

## Lead Exposure

### Childhood Lead Exposure Ottawa County, 2003-2004

|                                                                       | 2003   |         | 2004   |         |
|-----------------------------------------------------------------------|--------|---------|--------|---------|
|                                                                       | Number | Percent | Number | Percent |
| Number of residents under age 6                                       | 21,940 |         | 21,940 |         |
| Number who had their lead levels tested                               | 1,199  | 5       | 1,804  | 8.2     |
| Number found with elevated lead levels                                | 14     | 1.2     | 13     | 0.7     |
| Number found with elevated lead levels between ages 1 and 2 years old | 6      | 0.5     | 8      | 0.8     |

Children Under 6 Years with Elevated Blood Lead Levels  
Ottawa County, 2003 and 2004



- ✓ In 2003, 18% of houses in Ottawa County, and 27% in Michigan were estimated to have been built before 1950 and posed a health threat because they were a source of potential lead exposure.
- ✓ In 2004, Ottawa County had 7 zip codes (49403, 49404, 49417, 49423, 49434, 49435 and 49464) that were designated as high risk for childhood lead poisoning.

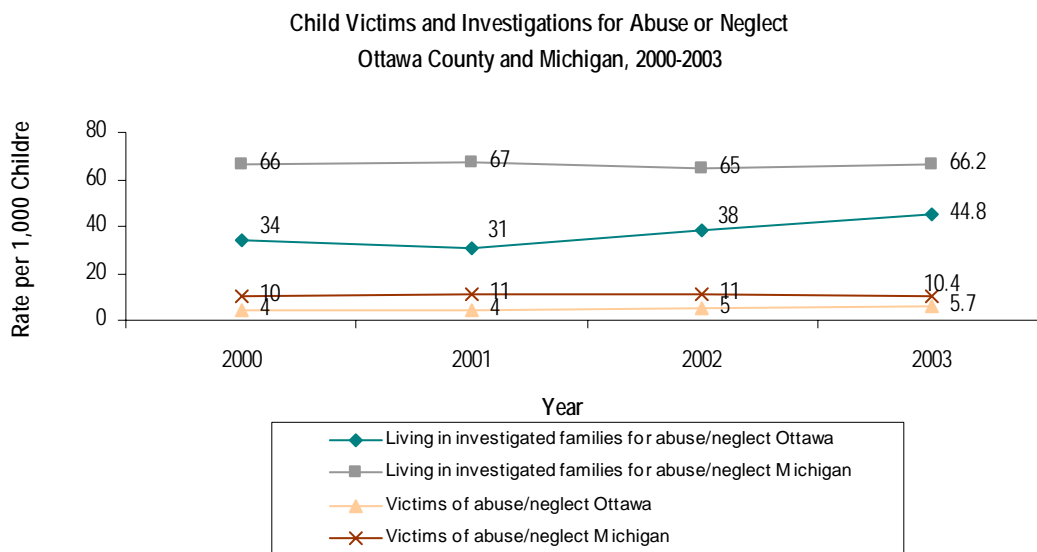
## SOCIAL AND MENTAL HEALTH

The measure of health is not only the absence of physical disease. It is important to also consider mental health status and other indicators of social health when assessing the overall health of the community. Factors that influence the mental health status such as violence, abuse and other safety issues could affect physical

### Mental Health Status

- ✓ According to the 1999 Ottawa County BRFS, 30.9% of respondents indicated that stress, depression or an emotional issue had been a problem in the past month. More female respondents (35.7%) indicated it was a problem compared to males (24.1%). Individuals aged 45 to 54 years old (36.5%) were more likely to respond that stress, depression or an emotional issue had been a problem in the past month.

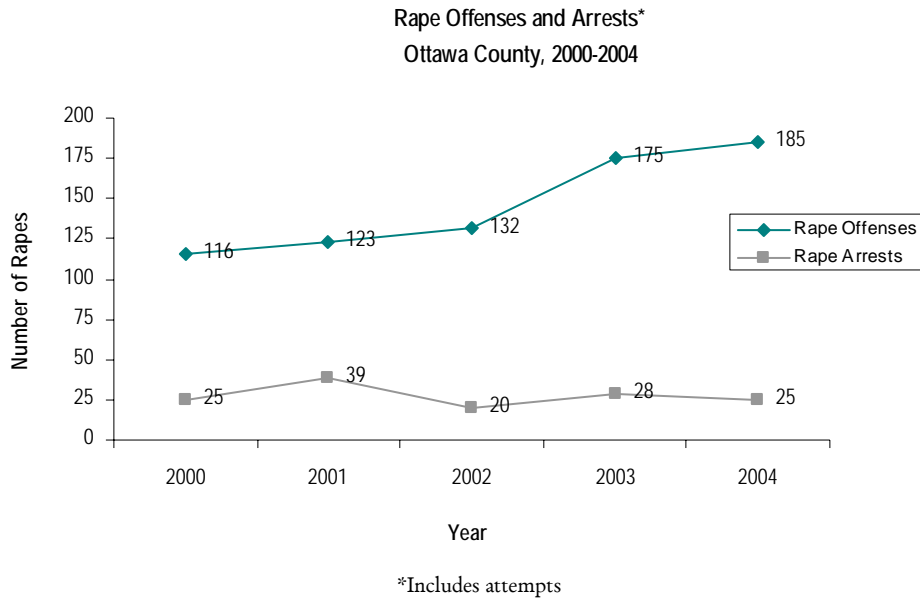
### Abuse



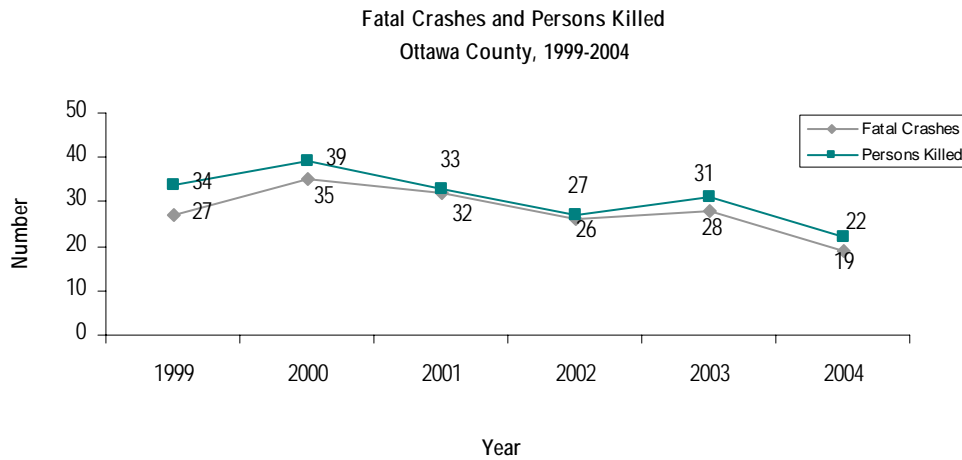
- ✓ Overall, the Ottawa County rates were below Michigan rates for both children living in families investigated for neglect or abuse and confirmed child victims of abuse and neglect. The trend for confirmed child victims of abuse fluctuated. There was no significant change in trend for Ottawa County. On the other hand, the trend for children living in families investigated for abuse and neglect increased in Michigan.
- ✓ According to the Michigan Kids Count Data Book, Ottawa County in 2003 was ranked 10<sup>th</sup> out of 83 counties in Michigan for children living in families investigated for abuse or neglect. A rank of 1 means a county had a lower rate of children living in investigated families compared to other counties in the state.



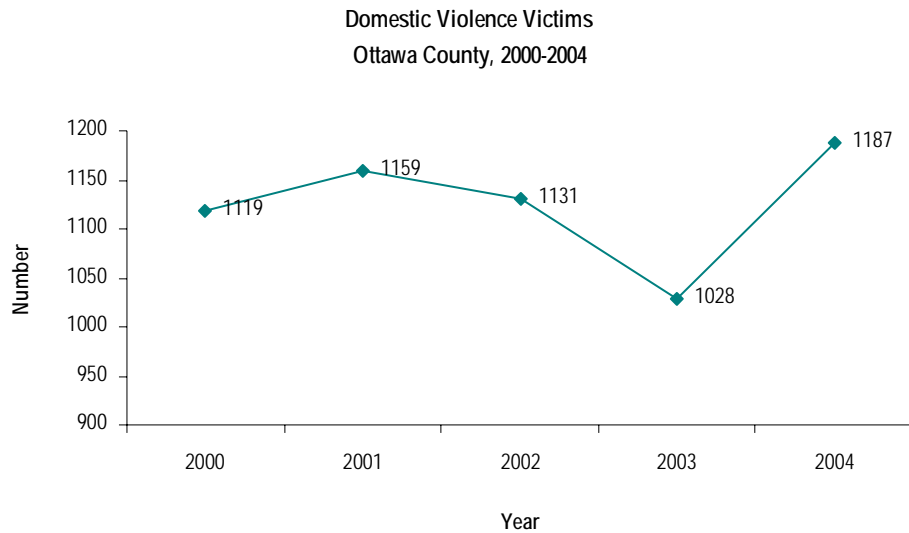
- ✓ According to the Michigan Kids Count Data Book, Ottawa County in 2003 was ranked 13<sup>th</sup> out of 83 counties in Michigan for confirmed child victims of abuse or neglect. A rank of 1 means a county had a lower rate of confirmed victims compared to other counties in the state.



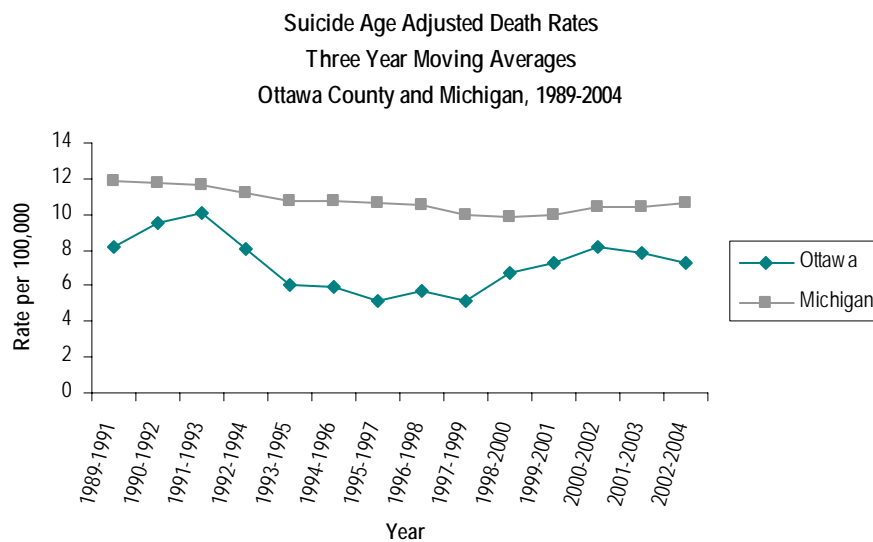
## Violence and Injury



- ✓ The trend indicated that for both Michigan and Ottawa County the number of fatal crashes and persons killed in the crashes decreased.

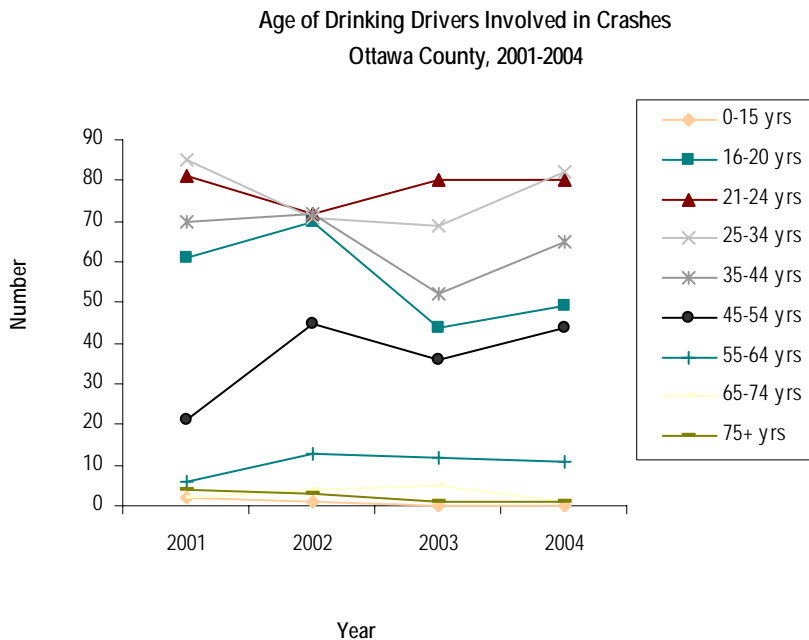
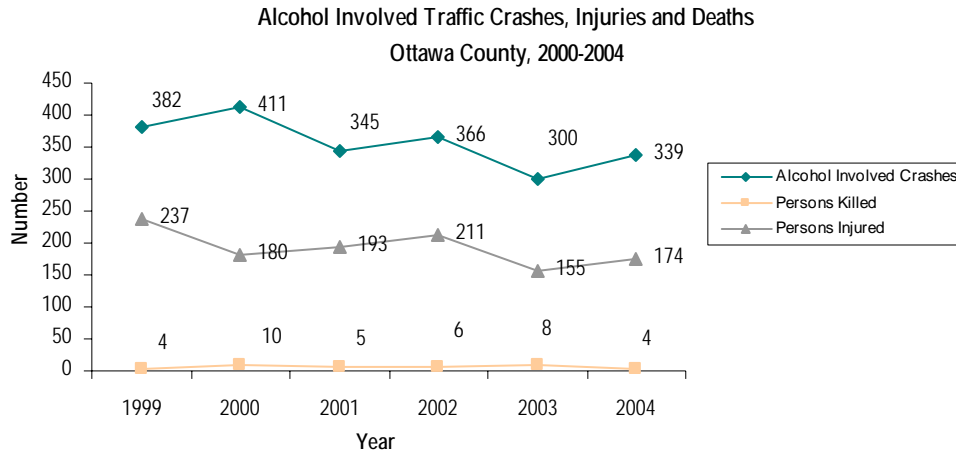


- ✓ In Ottawa County, the number of domestic violence victims decreased from 2001 to 2003. After 2003, there was an increase in the number of victims reported. Generally, there were more female victims of domestic violence in Ottawa County than males. In 2004, there were 897 females and 289 male victims.



- ✓ From 1989 to 2003, the age adjusted rate for suicide was higher in Michigan compared to Ottawa County. The suicide rate for Ottawa County rose from 1998 to 2003. From 1992 to 1999, Ottawa County experienced a decline in the suicide rate. Ottawa County residents aged 25 to 74 years old were more likely to commit suicide compared to those under 25 and those 75 and over.
- ✓ According to the 2004 Michigan Kids Count Data Book, Ottawa County was ranked 16<sup>th</sup> amongst 83 counties in Michigan for deaths by accident, homicide and suicide for

teens aged 15 to 19 years. A rank of 1 means a county has the best rate compared to other counties in the state. The rate of accidents, homicides and suicides for teens aged 15 to 19 years was 46.1 per 100,000 teens, which was the same as Michigan.



- ✓ In Ottawa County in 2003, the age group 21 to 24 years old had the highest number of crashes where drinking was involved in the crash (26.6%), followed by age group 25 to 34 years old with 22.9%.
- ✓ In Ottawa County in 2004, the age group 25 to 34 years old had the highest number of crashes where drinking was involved in the crash (24.3%), followed by age group 21 to 24 years old with 23.7%.
- ✓ In Ottawa County from 2001 to 2004, the trend for underage drinking drivers involved in crashes decreased for both age groups 0 to 15 years and 16 to 20 years.

## DATA SOURCES

| Demographic Characteristics        |                                                                  |
|------------------------------------|------------------------------------------------------------------|
| Population Trends:                 | U. S. Census Bureau                                              |
|                                    | Michigan Department of Community Health                          |
| Race and Language:                 | U. S. Census Bureau                                              |
|                                    | U. S. Census Bureau                                              |
| Socioeconomic Characteristics      |                                                                  |
| Poverty:                           | U. S. Census Bureau                                              |
|                                    | Michigan Kids Count Data Book                                    |
| Income and Employment:             | U. S. Census Bureau                                              |
|                                    | U.S. Department of Labor                                         |
| Education:                         | U.S. Census Bureau                                               |
|                                    | Michigan Kids Count Data Book                                    |
| Access to Healthcare Services      |                                                                  |
| General Health:                    | Michigan Department of Community Health BRFS                     |
|                                    | Ottawa County BRFS                                               |
| Health Insurance:                  | Michigan Department of Community Health BRFS                     |
|                                    | Ottawa County BRFS                                               |
| Accessing Services:                | Ottawa County BRFS 1999                                          |
| Health System Capacity:            | Michigan Department of Community Health Bureau of Health Systems |
|                                    | Ottawa County BRFS                                               |
|                                    | Primary Health Care Profile of Michigan                          |
| Mortality                          |                                                                  |
| Death Rates:                       | Michigan Department of Community Health                          |
| Leading Causes of Death:           | Michigan Department of Community Health                          |
| Premature Mortality:               | Michigan Department of Community Health                          |
| Morbidity                          |                                                                  |
| Preventable Hospitalization:       | Michigan Department of Community Health                          |
| Cancer Surveillance:               | Michigan Department of Community Health                          |
| Communicable Disease Surveillance: | Michigan Disease Surveillance System                             |
| Maternal, Infant and Child Health  |                                                                  |
| Live Births:                       | Michigan Department of Community Health                          |
|                                    | Michigan Kids Count Data Book                                    |
| Birth Outcomes:                    | Michigan Department of Community Health                          |
|                                    | Michigan Kids Count Data Book                                    |
| Maternal Characteristic:           | Michigan Department of Community Health                          |
|                                    | Michigan Kids Count Data Book                                    |
| Family Planning:                   | Michigan Department of Community Health                          |
|                                    | Michigan Kids Count Data Book                                    |
| Modifiable Risk Factors            |                                                                  |
| Nutrition & Overweight:            | Michigan Department of Community Health BRFS                     |

|                                      |                                                           |
|--------------------------------------|-----------------------------------------------------------|
|                                      | Ottawa County BRFS                                        |
| Physical Activity:                   | Michigan Department of Community Health BRFS              |
|                                      | Ottawa County BRFS                                        |
| Substance Abuse:                     | Michigan Department of Community Health BRFS              |
|                                      | Ottawa County BRFS                                        |
| Tobacco Use:                         | Michigan Department of Community Health BRFS              |
|                                      | Ottawa County BRFS                                        |
| Health Screenings:                   | Michigan Department of Community Health BRFS              |
|                                      | Ottawa County BRFS                                        |
|                                      | CDC National Immunization program                         |
|                                      | Michigan Childhood Immunization Registry                  |
| Cardiovascular Disease Risk Factors: | Michigan Department of Community Health                   |
|                                      | Ottawa County BRFS                                        |
| Responsible Sexual Behavior:         | Michigan Department of Community Health BRFS              |
|                                      | Ottawa County BRFS                                        |
| <b>Environmental Health</b>          |                                                           |
| Air Quality:                         | Environmental Protection Agency Air Quality Index Summary |
|                                      | Michigan Department of Community Health BRFS              |
|                                      | Ottawa County BRFS                                        |
| Water Quality:                       | Ottawa County Health Department, Environmental Health     |
| Hazardous Waste:                     | Ottawa County Health Department, Environmental Health     |
|                                      | Ottawa County BRFS                                        |
| Food Safety:                         | Michigan Disease Surveillance System                      |
|                                      | Ottawa County Health Department Food Service Division     |
| Lead Exposure:                       | Michigan Department of Community Health                   |
| <b>Social and Mental Health</b>      |                                                           |
| Mental Health Status:                | Ottawa County Community Mental Health                     |
|                                      | Ottawa County BRFS                                        |
| Abuse:                               | Michigan Kids Count Data Book                             |
|                                      | Michigan State Police Uniform Crime Report                |
| Violence and Injury:                 | Michigan State Police Uniform Crime Report                |
|                                      | Michigan Office of Highway Safety Planning                |
|                                      | Michigan Department of Community Health                   |