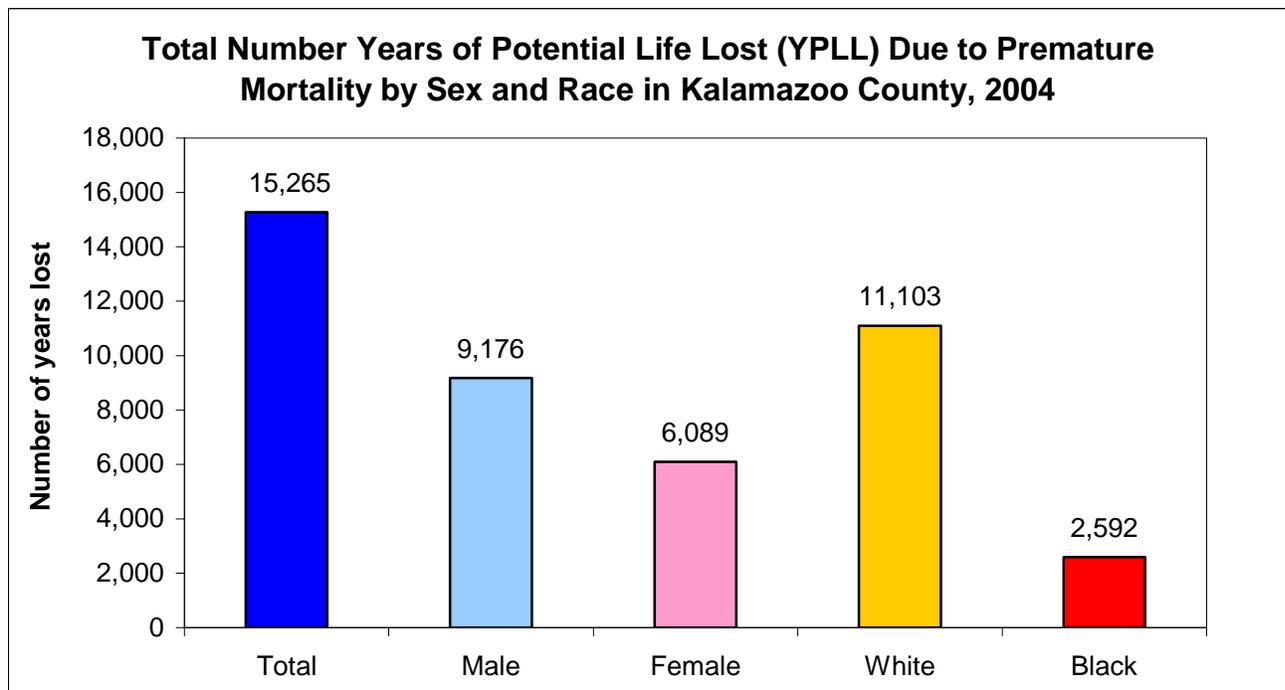


## 3.4 Years of Potential Life Lost

### 3.4.1 Years of Potential Life Lost Due to Premature Mortality

Years of Potential Life Lost (YPLL) is a measure of premature mortality, or mortality among the population younger than age 75 (the average life expectancy in the United States is over 75 years). The number of years of potential life lost is calculated as the number of years between the age at death and 75 years of age for persons dying before their 75th year. For example, the death of a person at 20 years of age counts as 55 years of life lost in YPLL calculations. Summing the number of YPLL for all deaths results in the total number of YPLL due to premature mortality in a population.

The chart below illustrates the total number of YPLL in Kalamazoo County in 2004 by population group. The total number of YPLL simply provides a measure of total years lost within each group. Note that because the total YPLL does not take population size into account, conclusions about differences among groups cannot be made from this information.

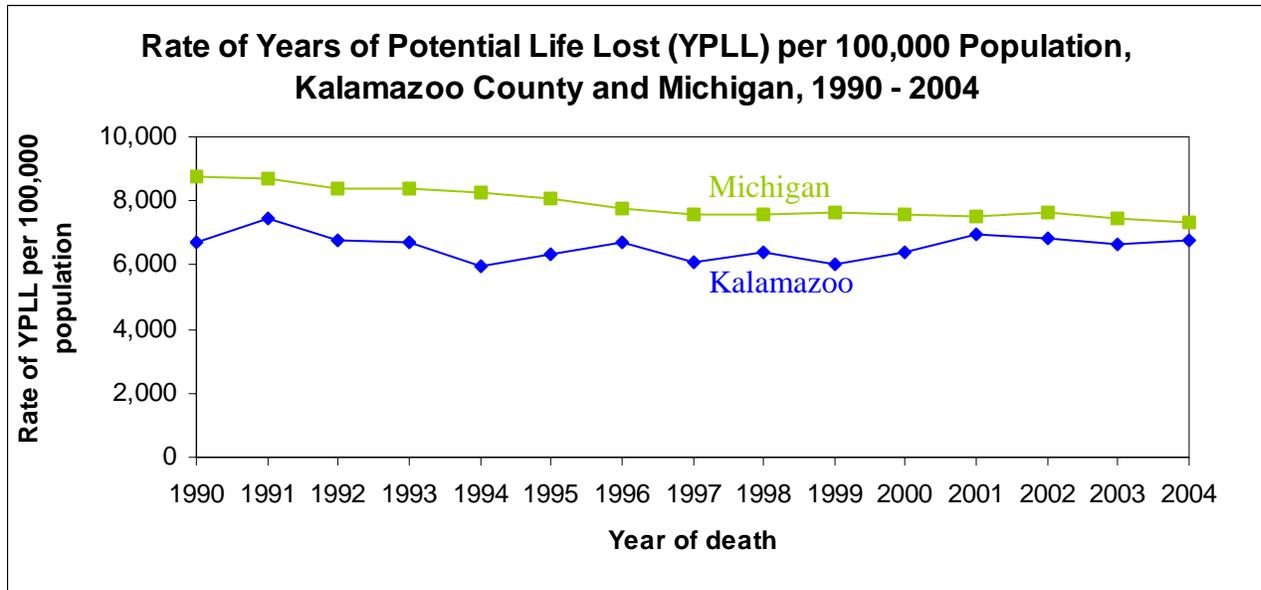


Mortality data source: Michigan Department of Community Health, Division for Vital Records and Health Data Development, Michigan Resident Mortality File

Dividing the total YPLL by the total number of people in the population gives a **rate** of YPLL per population (e.g. per 100,000 population); this is similar to calculating a crude mortality rate (number of deaths divided by the number of people in a population). The rate of YPLL per population gives an idea of the magnitude of years that are collectively lost due to premature death.

Calculating the rate provides greater comparability among groups than looking at total number of YPLL alone because it takes population size into account.

The chart and table below illustrate the rate of YPLL per 100,000 population over time in Kalamazoo County and Michigan. Kalamazoo County's rate of YPLL per 100,000 population has been consistently lower than the rate in Michigan since 1990. Michigan's rate appears to have been declining over this time period, and Kalamazoo County's rate appears to have been unchanged over time.



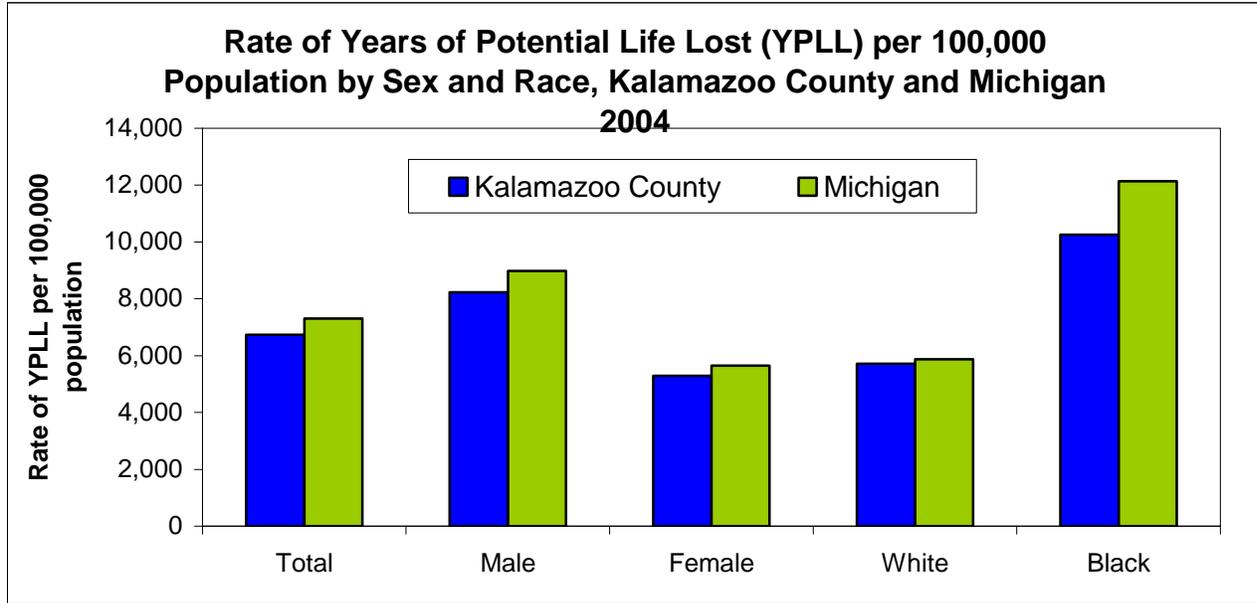
Mortality data source: Michigan Department of Community Health, Division for Vital Records and Health Data Development, Michigan Resident Mortality File

**Rate of Years of Potential Life Lost (YPLL) per 100,000 Population, Kalamazoo County and Michigan 1990 - 2004**

Year of Death	Kalamazoo County	Michigan
1990	6,688.9	8,745.5
1991	7,459.0	8,673.5
1992	6,755.6	8,378.0
1993	6,719.7	8,413.8
1994	5,988.4	8,244.2
1995	6,332.6	8,071.6
1996	6,688.7	7,742.5
1997	6,069.7	7,591.8
1998	6,413.9	7,574.3
1999	6,043.3	7,644.9
2000	6,392.9	7,606.1
2001	6,940.5	7,535.1
2002	6,849.1	7,613.5
2003	6,617.1	7,448.9
2004	6,740.1	7,311.4

Mortality data source: Michigan Department of Community Health, Division for Vital Records and Health Data Development, Michigan Resident Mortality File

The chart below and the following table show the rate of YPLL per 100,000 population among different groups in Kalamazoo County and in Michigan in 2004. The rate is highest among the black population in both the county and in the state. Each group in Kalamazoo County has a lower rate than the corresponding group in Michigan overall.



Mortality data source: Michigan Department of Community Health, Division for Vital Records and Health Data Development, Michigan Resident Mortality File

**Rate of Years of Potential Life Lost (YPLL) per 100,000 Population and Average Number of YPLL per Death by Sex and Race, Kalamazoo County and Michigan 2004**

Group	Kalamazoo County		Michigan	
	Rate per 100,000 Population	Average YPLL per Death	Rate per 100,000 Population	Average YPLL per Death
<b>Total</b>	6,740.1	19.9	7,311.4	19.0
<b>Male</b>	8,231.1	20.2	8,980.7	19.8
<b>Female</b>	5,294.8	19.5	5,646.3	17.8
<b>White</b>	5,712.1	17.6	5,874.4	16.6
<b>Black</b>	10,258.5	25.7	12,140.4	23.5

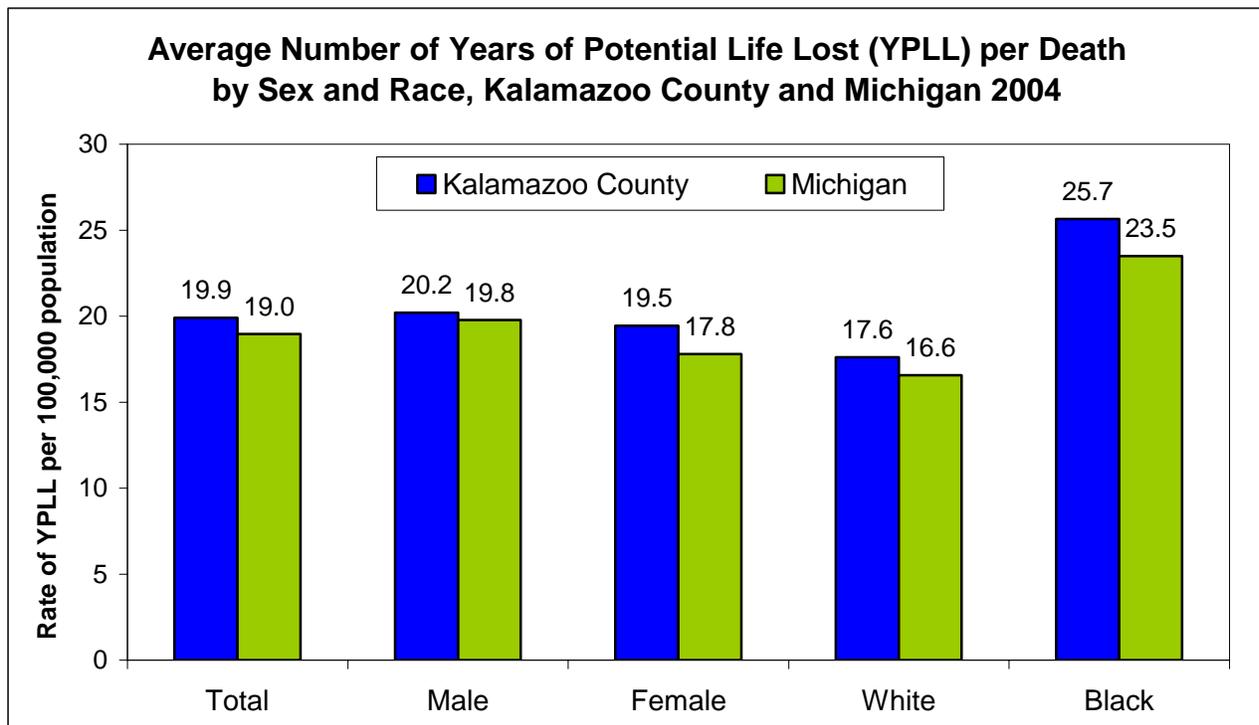
Mortality data source: Michigan Department of Community Health, Division for Vital Records and Health Data Development, Michigan Resident Mortality File

The columns to the right of the rate columns in the table above provide an additional measure of premature mortality: the average YPLL **per death**. This measure gives some insight into the ages at which people die. While the rate per 100,000 population gives information about the loss of potential years in comparison to a total population, the average YPLL per death gives information about how prematurely people died. The greater the average number of YPLL per death, the younger the age at which the average person died. For example, 110 YPLL could be due to two 20 year-olds dying or it could be due to eleven 70 year-olds dying. These two situations would result in the same **rate of YPLL per population**. As an alternative measure, the average YPLL per death for the former situation would be 55 YPLL per death; the YPLL per death for the latter situation would

be an average of five years per death. Considering the average YPLL per death provides insight into how prematurely individuals are dying in a population.

The chart below illustrates differences in average YPLL per premature death among population groups in Kalamazoo County and in Michigan. Among the total population in Kalamazoo County, the average YPLL per death is slightly higher than the average in Michigan (on average, individuals dying prematurely are losing about 19 years of potential life in Michigan and about 20 years in Kalamazoo County). Males in Kalamazoo die more prematurely than females (20.2 years early on average in comparison to 19.5 years early); these are both slightly higher than the average YPLL per death for these groups in Michigan.

Among premature deaths in Kalamazoo County in 2004, deaths among the black population occurred at younger ages on average than deaths among the white population. The average number of YPLL per premature death among the black population was 25.7; in comparison, the average number of YPLL per premature death among the white population was 17.6. A possible contributor to this disparity is the disparity in infant mortality rates among black and white births in Kalamazoo County. Between 2000 and 2004, black infants were almost three times more likely to die as white infants (2.7 times more likely). Because infant deaths are averaged along with deaths at all other ages in calculations of YPLL per death, even if rates of death between white and black populations were similar at older ages, the disparity in infant deaths would make the average YPLL per death much higher in a population with a greater infant mortality rate.

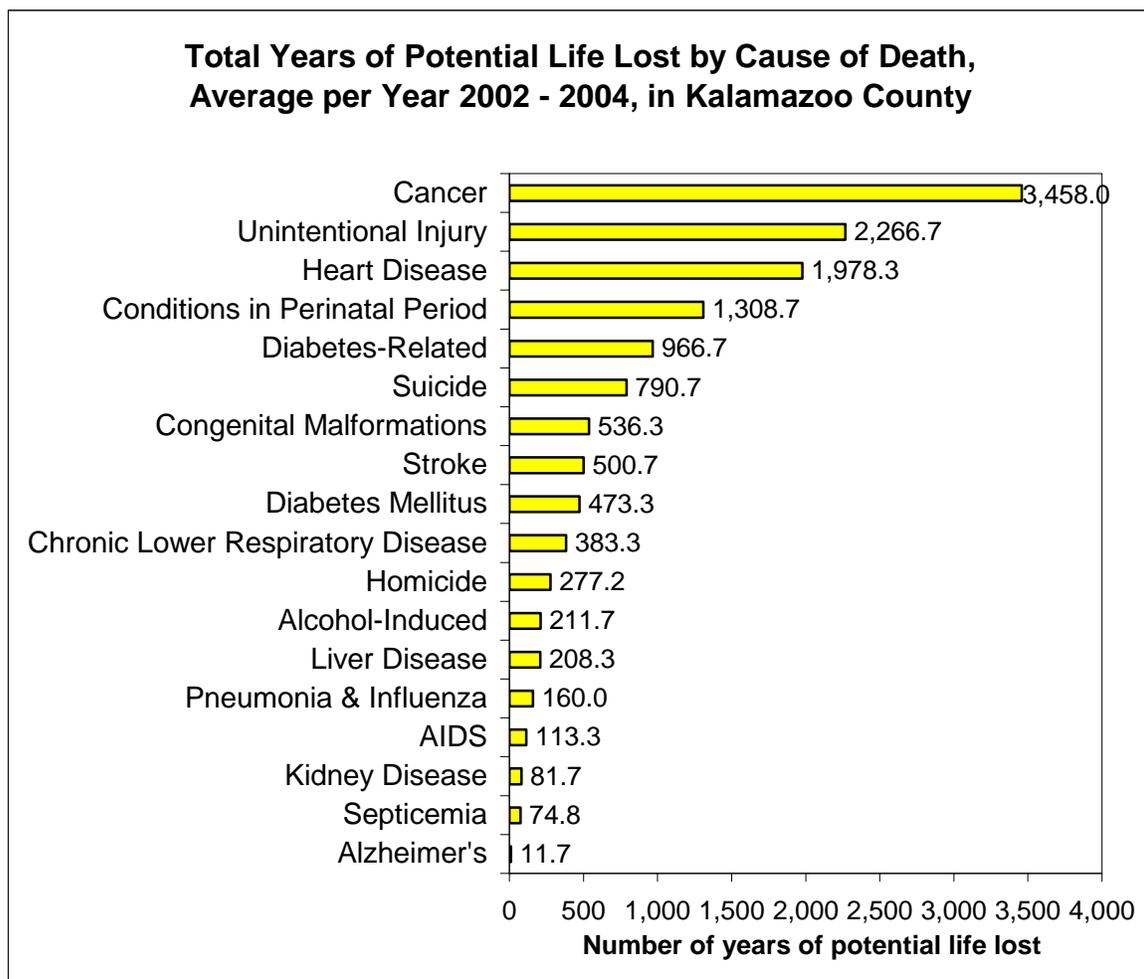


Mortality data source: Michigan Department of Community Health, Division for Vital Records and Health Data Development, Michigan Resident Mortality File

### 3.4.2 Years of Potential Life Lost by Cause of Death

This section presents years of potential life lost (YPLL) by leading cause of death in Kalamazoo County. (For explanation of YPLL and its accompanying measures, please refer to Section 3.4.1 “Years of Life Lost Due to Premature Mortality” of the Health Surveillance Data Book.)

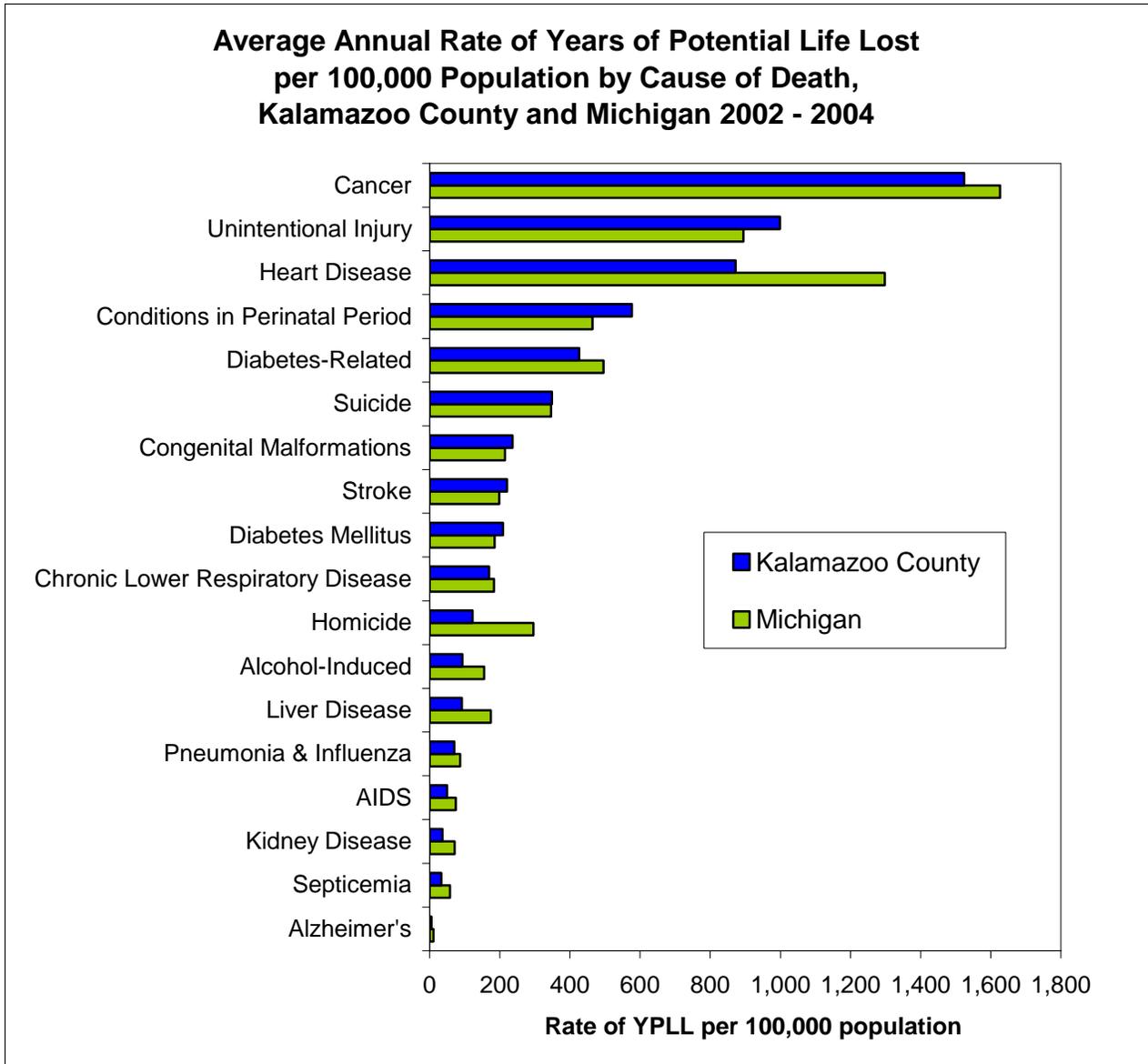
The chart below shows the three-year average number of YPLL by cause of death in Kalamazoo County among the total population. Cancer, unintentional injury, and heart disease were responsible for more than 7,700 years of potential life lost in the county per year between 2002 and 2004.



Mortality data source: Michigan Department of Community Health, Division for Vital Records and Health Data Development, Michigan Resident Mortality File

The rate of YPLL per population and the average YPLL per death both provide information about the impact of a particular cause of death on a population. The YPLL per population provides an indication of the magnitude to which the population is being impacted by premature deaths due to a particular cause, and the YPLL per death provides an indication of how prematurely the deaths due to a cause are occurring. A specific cause may cause a small number of deaths and the rate of YPLL per population may be relatively low, but if these deaths occur early in life, the YPLL per death will be high. Another cause may be responsible for a large number of deaths that, when added together, result in a high YPLL rate per population. If these deaths typically occur late in life, however, the average YPLL per death will be relatively low.

The rates of YPLL per population by causes of death for Kalamazoo County and Michigan are shown in the chart below. Kalamazoo County and Michigan rates of YPLL are similar for most causes of death. However, in Kalamazoo County, more YPLL per population are lost due to unintentional injury deaths and deaths due to conditions arising in the perinatal period than in Michigan overall. In Michigan, the rates of YPLL per population due to heart disease and homicide are notably higher than in Kalamazoo County.



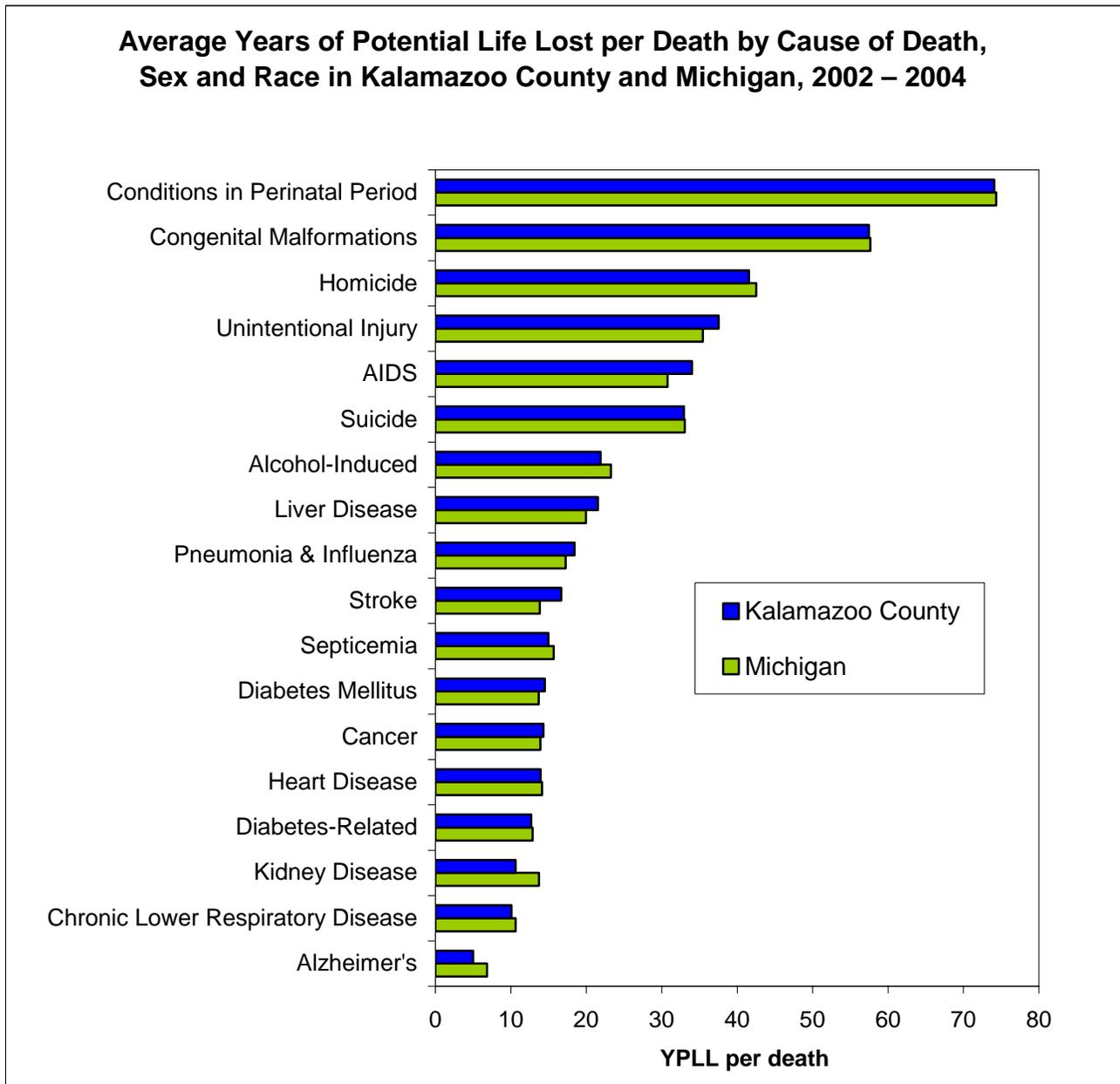
Mortality data source: Michigan Department of Community Health, Division for Vital Records and Health Data Development, Michigan Resident Mortality File

**Average Annual Rate of Years of Potential Life Lost (YPLL) per 100,000 Population  
by Cause of Death in Kalamazoo County and Michigan, 2002 – 2004**

<b>Cause of Death</b>	<b>Kalamazoo County</b>	<b>Michigan</b>
AIDS	50.0	74.0
Alcohol-Induced	93.3	155.3
Alzheimer's	5.1	10.9
Cancer	1,524.1	1,626.1
Chronic Lower Respiratory Disease	169.0	183.1
Conditions in Perinatal Period	576.8	464.5
Congenital Malformations	236.4	214.4
Diabetes Mellitus	208.6	184.7
Diabetes-Related	426.1	495.6
Heart Disease	872.0	1,297.9
Homicide	122.2	295.8
Kidney Disease	36.0	71.1
Liver Disease	91.8	174.6
Pneumonia & Influenza	70.5	86.4
Septicemia	33.0	57.5
Stroke	220.7	198.3
Suicide	348.5	346.5
Unintentional Injury	999.0	894.9

Mortality data source: Michigan Department of Community Health, Division for Vital Records and Health Data Development, Michigan Resident Mortality File

Comparing the average number of YPLL per death by cause in Kalamazoo County to the average YPLL per death in Michigan shows that ages at which premature deaths in the county occurred were similar to ages at which premature deaths occur in the state between 2002 and 2004. While the rate of YPLL per population reflects the total number of deaths that occur in a population, YPLL per death is not impacted by how many individuals died and only reflects the age at which each individual died.



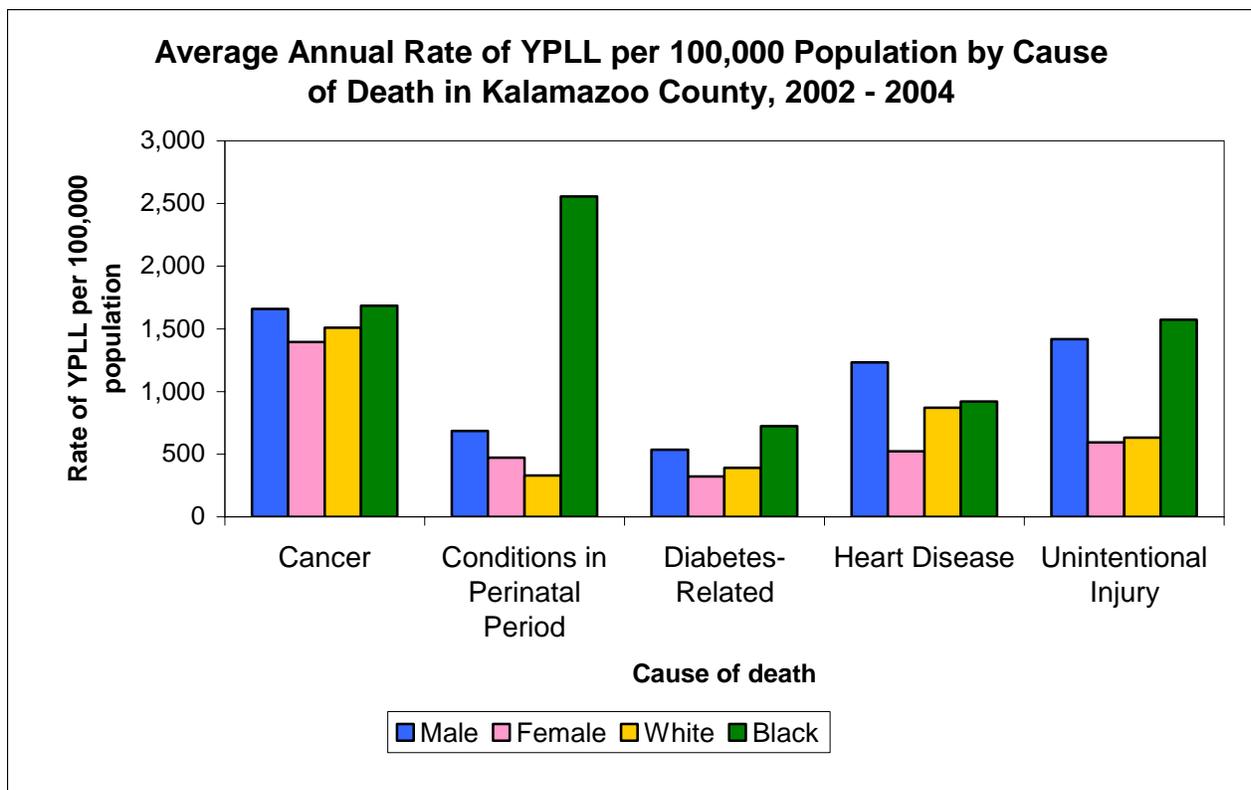
Mortality data source: Michigan Department of Community Health, Division for Vital Records and Health Data Development, Michigan Resident Mortality File

**Average Years of Potential Life Lost (YPLL) per Death by Cause of Death  
in Kalamazoo County and Michigan, 2002 – 2004**

<b>Cause of Death</b>	<b>Kalamazoo County</b>	<b>Michigan</b>
AIDS	34.0	30.8
Alcohol-Induced	21.9	23.3
Alzheimer's	5.0	6.9
Cancer	14.3	13.9
Chronic Lower Respiratory Disease	10.1	10.6
Conditions in Perinatal Period	74.1	74.3
Congenital Malformations	57.5	57.7
Diabetes Mellitus	14.5	13.7
Diabetes-Related	12.7	12.9
Heart Disease	14.0	14.2
Homicide	41.6	42.5
Kidney Disease	10.7	13.7
Liver Disease	21.6	19.9
Pneumonia & Influenza	18.5	17.3
Septicemia	15.0	15.7
Stroke	16.7	13.9
Suicide	32.9	33.1
Unintentional Injury	37.6	35.4

Mortality data source: Michigan Department of Community Health, Division for Vital Records and Health Data Development, Michigan Resident Mortality File

Within Kalamazoo County between 2001 and 2003, the average annual YPLL due to particular causes varied by population group. The chart below shows the five causes of death that were responsible for the greatest number of YPLL within each group: cancer, conditions arising in the perinatal period, diabetes-related causes, heart disease, and unintentional injury. Among males in Kalamazoo County, cancer and unintentional injury were responsible for the greatest number of YPLL in this time period (1,658 and 1,418 YPLL per 100,000 population, respectively). Females experienced the greatest number of YPLL due to cancer (1,395 YPLL per 100,000 population) and unintentional injuries (593 YPLL per 100,000 population). Among the white population, cancer and heart disease caused the greatest number of YPLL (1,509 and 869 YPLL per 100,000 population), and among the black population the causes of death causing the most YPLL were conditions arising in the perinatal period (2,556 YPLL per 100,000 population) and cancer (1,685 YPLL per 100,000 population).



Mortality data source: Michigan Department of Community Health, Division for Vital Records and Health Data Development, Michigan Resident Mortality File

**Average Annual Rate of YPLL per 100,000 Population and YPLL per Death by  
Cause of Death, Sex and Race in Kalamazoo County, 2002 – 2004**

Cause of Death	Male		Female		White		Black	
	Rate per 100,000 population	Average YPLL per death	Rate per 100,000 population	Average YPLL per death	Rate per 100,000 population	Average YPLL per death	Rate per 100,000 population	Average YPLL per death
AIDS	94.1	35.0	7.2	25.0	50.4	32.8	59.6	45.0
Alcohol-Induced	13.4	23.0	51.9	15.0	21.4	22.1	13.2	21.3
Alzheimer's	171.7	5.0	17.4	5.0	79.5	5.0	225.2	0.0
Cancer	6.0	14.2	4.3	14.4	6.0	14.0	0.0	15.5
Chronic Lower Respiratory Disease	185.1	11.5	153.3	8.8	173.6	9.7	152.3	16.4
Conditions in Perinatal Period	1,418.0	74.0	593.2	74.2	632.2	73.9	1,573.1	74.2
Congenital Malformations	544.9	55.7	158.2	59.9	324.4	55.7	119.2	61.9
Diabetes Mellitus	685.1	14.8	471.9	14.4	328.6	14.6	2,556.1	12.0
Diabetes-Related	189.6	13.2	250.8	12.1	177.3	12.7	450.4	12.1
Heart Disease	265.9	14.2	207.8	13.5	181.1	13.8	655.7	13.6
Homicide	256.8	41.0	141.7	42.4	192.4	38.6	317.9	46.1
Kidney Disease	534.5	9.4	321.0	11.4	389.9	10.0	722.0	12.1
Liver Disease	1,657.8	24.0	1,394.7	15.0	1,509.3	21.1	1,685.1	21.0
Pneumonia & Influenza	1,231.7	15.0	523.5	23.2	868.6	17.1	920.7	16.7
Septicemia	146.9	9.0	98.2	18.0	59.3	11.4	549.1	5.0
Stroke	25.4	15.5	46.3	17.7	23.9	15.0	112.6	18.9
Suicide	150.8	33.2	34.7	32.2	82.9	30.1	139.1	45.0
Unintentional Injury	67.2	38.0	73.8	36.6	55.6	31.3	132.5	42.4

Mortality data source: Michigan Department of Community Health, Division for Vital Records and Health Data Development, Michigan Resident Mortality File