Annual Wisconsin Death Report



May 2019 Release

Wisconsin Department of Health Services Division of Public Health Office of Health Informatics

FORWARD

The Department of Health Services is mandated by Wis. Stat. § 69.03(9) to prepare annual reports on vital statistics. The *Annual Wisconsin Death Report, 2017*, associated technical notes, and additional tables represent relevant public health information collected by the State Vital Records Office. Additional health-related statistical information for Wisconsin is available through the internet on the Department of Health Services site, at http://dhs.wisconsin.gov/stats/. Wisconsin Interactive Statistics on Health (WISH) is an online data query system, located at http://dhs.wisconsin.gov/stats/. Wisconsin Interactive Statistics on Health (WISH) is an online data query system, located at http://dhs.wisconsin.gov/stats/. Wisconsin Interactive Statistics on Health (WISH) is an online data query system, located at http://dhs.wisconsin.gov/wish, which includes death data for multiple years and geographic areas in Wisconsin. Technical notes and detailed tables for this report are available at https://www.dhs.wisconsin.gov/stats/deaths/index.htm.

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Office of Health Informatics Division of Public Health 1 W. Wilson Street, Rm 118 Madison, WI 53703 Telephone: 608-266-0377 Email: dhshealthstats@dhs.wisconsin.gov This report presents information about deaths that occurred in 2017 among Wisconsin residents. Information from previous years (2008 onward) is also presented to show changes over time. This report includes information on the number and rate of deaths, demographic characteristics of the decedents, such as age and race/ethnicity, characteristics of deaths by geographic location, and disposition of bodies.

Mortality data presented in this report are primarily based on the underlying cause of death, which the World Health Organization defines as "the disease or injury that initiated the train of morbid events leading directly to death, or the circumstances of the accident or violence which produced the fatal injury."¹

County and state rates in the report are age-adjusted rates per 100,000 or 10,000 population using the 2000 U.S. standard population.

Beginning September 1, 2013, Wisconsin began collecting data using a new web-based data entry system for funeral directors, medical examiners, coroners, and certifying physicians. The new system adopted the 2003 U.S. Standard Certificate of Death. Many changes have been made to the data collection process; some information is no longer collected, new information has been added, and some data definitions have been altered. Please refer to the technical notes for a more complete description of these changes.

All data refer to Wisconsin residents unless otherwise noted. Also, the information presented is based on the place of residence, which means that events have been assigned to the area where the person lived (usually legal residence) regardless of where the events occurred.

The cancer mortality data in this report are classified differently from what appears in publications from the Wisconsin Cancer Reporting System (WCRS) (<u>https://www.dhs.wisconsin.gov/wcrs/data-pubs.htm</u>) and its public use interactive query systems: WISH Query on Cancer Mortality (<u>https://wish.wisconsin.gov/cancer/mortality.htm</u>) and Cancer-Rates.Info (<u>https://www.cancer-rates.info/wi/</u>). WCRS follows the National Cancer Institute's definition of mortality cancer site groupings, which are defined consistently over time to facilitate reporting of long-term cancer mortality trends (<u>https://seer.cancer.gov/</u>codrecode/1969_d03012018/index.html). Due to this different site group classification used by WCRS, the numbers in this report may not match the numbers found in the WCRS cancer-specific query modules or publications.

Note: Due to differences in cutoff dates and out-of-state reporting, U.S. rates for 2017 were from provisional data available from the National Center for Health Statistics. Provisional rate estimates were not available separated by sex.

^{1 &}lt;u>http://www.who.int/topics/mortality/en/</u>

EXECUTIVE SUMMARY

Deaths Overall

- 52,679 deaths in Wisconsin in 2017; 724 deaths/100,000 population
- Higher mortality rate among men compared to women
- Highest mortality rates among African Americans and Native Americans
- 11,815 deaths due to heart disease; 11,287 due to cancer; 3,707 due to unintentional injury
- 8 percent of deaths received an autopsy
- 35 percent of deaths resulted in burial; 59 percent resulted in cremation

Notable Trends

- There are more deaths in Wisconsin: Wisconsin had 14 percent more deaths compared to 10 years ago (17 percent more male deaths and 9 percent more female deaths.) The age-adjusted mortality rate has not changed significantly, and 77 percent of decedents in both 2007 and 2017 were people over 65.
- Wisconsin's growing elderly population is living longer: The death rate for age 65+ population decreased 10 percent in the last 10 years.
- **Chronic diseases are causing fewer deaths**: Rates of heart disease and cancer decreased for both men and women; female heart disease deaths decreased by 10 percent in the last 10 years.
- The age-adjusted mortality rate is changing in the following Wisconsin sub-populations:
 - African Americans (3 percent increase in five years)
 - Native Americans (15 percent decrease in five years)
- The following causes of death are becoming more likely:
 - Unintentional injuries, specifically falls (3 percent increase) and poisonings (13 percent increase)
 - Breast cancer (5 percent increase in 1 year) and oral cancer (13 percent increase in one year)

Top Causes of Death

The top three causes of death in 2017 were cardiovascular disease, cancer, and unintentional injury. As with previous years, deaths due to cardiovascular disease and cancer are, overall, decreasing, and deaths due to unintentional injury are increasing.

Heart Disease

- #1 cause of death overall and for those 65 and older
- Wisconsin rate is lower than the national rate
- Mortality rate for men is almost twice that of women
- Ischemic heart disease is most common

Cancer

- #2 cause of death overall and for those 65 and older; #1 cause for 45- to 64-year-olds
- Wisconsin rate is similar to U.S. rate
- Overall cancer rates have been decreasing
- Lung and trachea cancer cause one in four cancer deaths

Unintentional Injury

- #3 cause of death overall; #1 cause for 1- to 44-year-olds
- Wisconsin rate is almost 20 percent higher than national rate
- Falls account for 42 percent of unintentional injuries, followed by poisonings (30 percent)
- Poisonings are up 141 percent in the last 10 years

There were 52,679 deaths of Wisconsin residents in 2017. This is a 2 percent increase from the 51,788 deaths recorded in 2016.

In 2017, there were 52,679 deaths of Wisconsin residents, 891 more than in 2016. In the last five years, the number of deaths has increased by 6 percent, from 49,917 in 2013 to 52,679 in 2017.

In 2017, the Wisconsin crude mortality rate was 913.5 deaths per 100,000 population. The age-adjusted mortality rate was 724 per 100,000. Until 2009, age -adjusted mortality rates were decreasing in Wisconsin. During that time, Wisconsin had a significantly lower age-adjusted rate than the U.S. However, Wisconsin's mortality rates began to increase in 2009 while the national rates were decreasing. As a result, the age-adjusted Wisconsin death rate is now nearing the national rate (Figure 1).

Stratified by sex, the 2017 age-adjusted mortality rates in Wisconsin were very similar to the national rates. Overall in Wisconsin, males had a higher mortality rate than females. Mortality rates, when adjusted for age, were 41 percent higher for males than females in 2017 (859.4 versus 608.2). The same holds true when comparing males and females at the national level (Figure 2). Figure 1. Age-adjusted mortality rates for the United States and Wisconsin

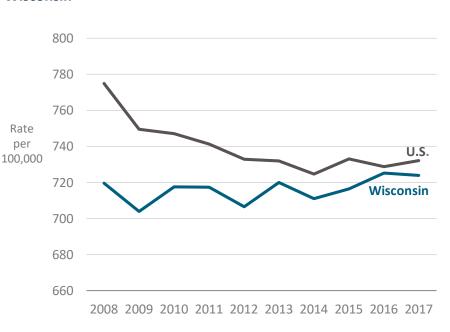
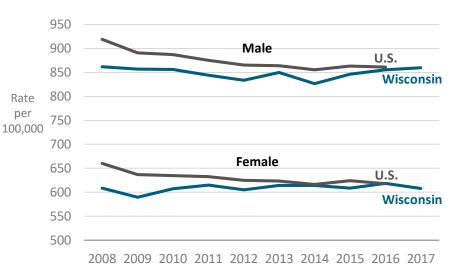


Figure 2. Age-adjusted mortality rates by sex for the U.S. and Wisconsin



OVERVIEW

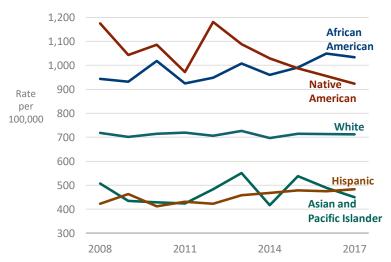
Table 1 shows the total number of deaths and mortality rates by age, sex, race/ethnicity, and Department of Health Services region. As expected, people over the age of 65 experienced a higher mortality rate than younger people and working-age adults. Although females accounted for almost 50 percent of the 2017 deaths, the age-adjusted mortality rates show that males tended to die at a younger age than females. Comparing the age-adjusted mortality rates by race and ethnicity demonstrates that non-Hispanic (NH) Native Americans and NH African Americans died at a younger age compared to the NH White population. There is no statistical difference in age-adjusted mortality rates between the regions of the state.

Demographics	Total deaths	Percent of deaths	Crude rate per 100,000 population	Age-adjusted rate per 100,000 population
Age				
Less than 5	470	0.9%	140.3	N/A
5 to 17	172	0.3%	18.1	N/A
18 to 25	509	1.0%	92.2	N/A
26 to 64	10,875	20.6%	363.4	N/A
65 and older	40,653	77.2%	4,271.0	N/A
Sex				
Female	25,811	49.0%	888.7	608.2
Male	26,868	51.0%	934.7	859.4
Race/Ethnicity				
Non-Hispanic White	48,160	91.5%	1,014.0	712.4
Non-Hispanic African American	2,792	5.3%	698.8	1,033.9
Non-Hispanic Native American	429	0.8%	750.4	923.1
Non-Hispanic Asian/Pacific Islander	404	0.8%	231.4	449.7
Hispanic	857	1.6%	215.3	483.8
DHS Region				
Northeastern	11,882	22.6%	959.3	741.1
Northern	5,108	9.7%	1,045.6	723.1
Southeastern	18,900	35.9%	892.9	771.8
Southern	9,446	17.9%	843.3	715.0
Western	7,326	13.9%	934.5	752.5
Total	52,679	100.0%	913.5	725.2

Table 1. Number of deaths and age-adjusted rates by demographics, 2017

Age-adjusted mortality rates have been fairly stable for Asian, Hispanic, and White populations, and going down for Native Americans. The Native American death rate has gone down 22 percent since peaking in 2012. Age-adjusted mortality for African Americans remains higher than other races in Wisconsin. Asians and Hispanics experienced lower age-adjusted mortality rates than NH Whites (Figure 3).

Figure 3. Age-adjusted mortality rates by race/ethnicity



KEY FINDINGS

Table 2 below shows the top 10 leading causes of death in Wisconsin in 2017 by age group. Across all age groups, heart disease and cancer were the leading causes of death. Unintentional injury has been the third leading cause of death for the past three years. These three causes accounted for a little over 50 percent of all deaths. For infants under 1 year, short gestation and low birth weight were the leading cause of death. Among people ages 1-44, unintentional injury was the leading cause, while cancer was the leading cause for those ages 45-64. Heart disease was the leading cause of death for those ages 65 and older.

Table 2. Top 10 causes of death by age, 2017

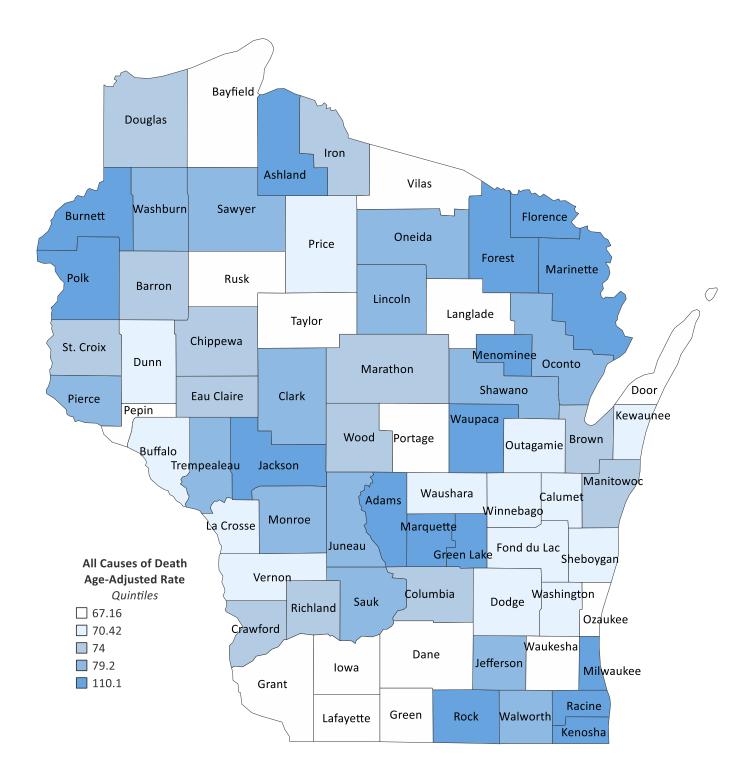
	Infants < 1	1 to 4	5 to 14	15 to 24	25 to 34	35 to 44	45 to 54	55 to 64	65+	All Ages
1	Short Gestation/ Low Birth Weight (82)	Unintentional Injury (10) (↓)	Unintentional Injury (23) (↓)	Unintentional Injury (246)	Unintentional Injury (450) (个)	Unintentional Injury (374) (个)	Cancer (682)	Cancer (1,973)	Heart Disease (9,872)	Heart Disease (11,815)
2	Congenital Malformations (82) (↓)	Congenital Malformations (8) (个)	Cancer (15) (个)	Suicide (112) (↓)	Suicide (156) (↑)	Cancer (166)	Heart Disease (486)	Heart Disease (1,243)	Cancer (8,368)	Cancer (11,287)
3	Pregnancy- Related (28) (个)	Cancer (7) (个)	Suicide (12) (↑)	Homicide (50) (↓)	Homicide (63) (↓)	Heart Disease (140) (↑)	Unintentional Injury (410)	Unintentional Injury (409) (个)	Chronic Lower Respiratory (2,471)	Unintentional Injury (3,707)
4	Unintentional Injury (25) (个)	Homicide (5)	Congenital Malformations (6) (↓)	Heart Disease (18) (个)	Cancer (58) (↓)	Suicide (137)	Suicide (170)	Chronic Lower Respiratory (293) (个)	Alzheimer's (2,397)	Chronic Lower Respiratory (2,830)
5	Placenta/Cord/ Membrane (15) (个)	Septicemia (<5) (↑)	Influenza/ Pneumonia (<5) (个)	Cancer (17) (↓)	Heart Disease (51) (↓)	Diabetes (35) (个)	Chronic Liver Disease (146) (↓)	Diabetes (233)	Stroke (2,201)	Stroke (2,509)
6	SIDS (15) (个)	Influenza/ Pneumonia (<5) (个)	Homicide (<5) (↓)	Congenital Malformations (6) (↓)	Chronic Liver Disease (12) (↑)	Homicide (33) (↓)	Diabetes (98)	Chronic Liver Disease (224)	Unintentional Injury (1,760)	Alzheimer's (2,419)
7	Bacteria Sepsis (8) (↓)	Perinatal (<5)	Septicemia (<5)	Stroke (<5)*	Septicemia (10) (个)	Chronic Liver Disease (32) (↓)	Stroke (87) (个)	Suicide (182) (个)	Diabetes (1,048)	Diabetes (1,428)
8	Circulatory (7)*	Heart Disease (<5)	Diabetes (<5)*	Diabetes (<5)*	Diabetes (9)	Stroke (28) (↑)	Chronic Lower Respiratory (49) (↓)	Stroke (178)	Influenza/ Pneumonia (848) (个)	Influenza/ Pneumonia (970)
9	Respiratory Distress (7) (↑)	Stroke (<5)	Stroke (<5) (↑)	Pregnancy- Related (<5) (↓)	Congenital Malformations (6)*	Influenza/ Pneumonia (11) (↓)	Influenza/ Pneumonia (36)	Kidney Disease (69) (↓)	Kidney Disease (819)	Kidney Disease (920)
10	Neonatal hemorrhage (7) (↓)	Acute Bronchitis (<5)*	In Situ/Benign/ Borderline Tumor (<5)*	Septicemia (<5)*	Legal Intervention (6)*	Kidney Disease (10)*	Septicemia (31)*	Septicemia (67)*	Parkinson's (684) (个)	Suicide (915)

Notes: (\uparrow) = at least a 10% increase since last year; (\downarrow) = at least a 10% decrease since last year; * = new cause in the top 10 leading causes of death

OVERVIEW

After adjusting for an aging population, mortality rates were highest in Florence, Menominee, Ashland, Forest, and Milwaukee counties (Map 1). Menominee county has consistently had one of the highest mortality rates for the past four years, as have Forest and Ashland counties.

Map 1. Age-adjusted mortality (per 10,000) for all causes of death by county, 2017



Heart disease, cancer, and unintentional injury are the three major leading causes of death in Wisconsin.

Heart Disease

Heart disease represents disease of the anatomical parts that constitute the heart, endocardium (internal lining of the heart wall and valves), myocardium (heart muscle), and pericardium (external lining of the heart), as well as the internal vessels of the heart, particularly the coronaries that supply blood to the heart.

Heart disease is a consequence of other conditions that affect the heart function. For example, hypertension leads to an increase in heart output and subsequently causes congestive heart failure. Coronary heart disease can also lead to acute myocardial infarction (heart attacks) or congestive heart failure. Some infectious diseases (such as strep throat) that cause immunologic reaction disorders may cause inflammation of the internal and external linings of the heart and subsequently lead to congestive heart failure.

Cancer

Malignant neoplasms, referred to as cancer, represent disorders of the cells that affect primary or secondary organs. Malignant neoplasms can be well-defined or ill-defined as well as specific or not specific to the affected tissue in any anatomical location, including blood and related tissues. Cancer mortality does not include in-situ neoplasms where the cancer hasn't expanded to the supporting structure of the organ where it originated.

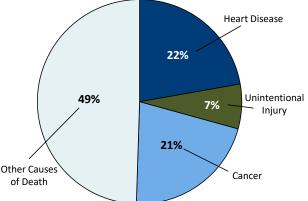
Unintentional Injury

Injuries represent any harm or damage to the body resulting from an external force, which can be physical (e.g., fire, blast, shock) or chemical (e.g., poison, prescription). The definition excludes psychological trauma. The intent of injuries is classified as unintentional, self-inflicted, assaults, or undetermined (when the intent is unknown or unclear).

Figure 4. Number of deaths by the three leading causes of death







TOP THREE LEADING CAUSES OF DEATH

Age-adjusted mortality rates of heart disease and cancer decreased 8 percent and 13 percent, respectively from 2008 to 2017. Conversely, the age-adjusted unintentional injury mortality rates increased 45 percent from 39.9 per 100,000 in 2008 to 57.9 per 100,000 in 2017 (Figure 6).

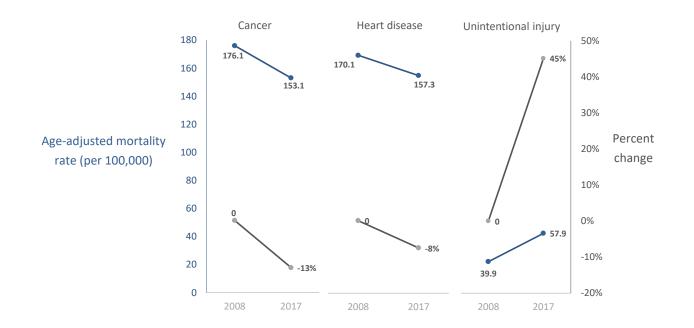
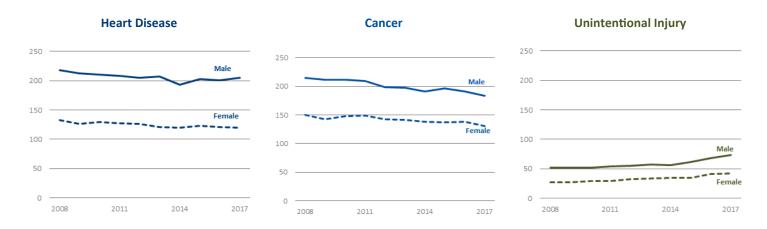


Figure 6. Age-adjusted rates and percent change for the top three causes of death

Adjusting for age, males were more likely to die from heart disease (1.7 times more likely), cancer (1.4 times), or unintentional injuries (1.8 times) than females in 2017. Rates of heart disease and cancer are going down for both men and women, with a slightly larger decrease in female heart disease deaths, down 10 percent in the last 10 years. Age-adjusted rates of unintentional injury have increased more for women (54 percent increase) than for men (43 percent increase) in the last 10 years, though over the last year the rate of unintentional injuries increased 8 percent for men, a four-fold increase compared to women (Figure 7).





In 2017, heart disease was the second leading cause of death overall, and the leading cause among the population aged 65 and older. The Wisconsin mortality rate remains lower than the U.S. rate (157.3 per 100,000 compared to 165.1). The Wisconsin age-adjusted heart disease mortality continues to decline, going down about 7 percent in the last 10 years. This is a slower decline than seen in the U.S. as a whole, which experienced a 14 percent decrease in heart disease mortality.

Figure 8. Age-adjusted rate of heart disease deaths for the United States and Wisconsin

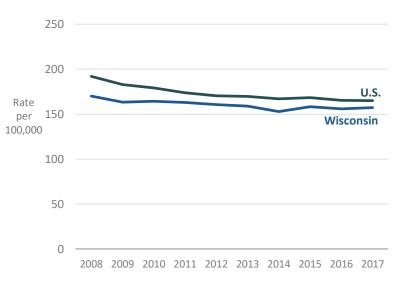


Table 3. Number of heart disease deaths and age-adjusted rates by demographics, 2017

Demographics	Total deaths	Percent of deaths	Crude rate per 100,000 population	Age-adjusted rate per 100,000 population
Age				
Less than 5	<5	-	-	N/A
5 to 17	<5	-	-	N/A
18 to 25	20	0.2%	3.6	N/A
26 to 64	1,916	16.2%	64.0	N/A
65 and older	9,872	83.6%	1,037.2	N/A
Sex				
Female	6,441	45.5%	185.0	119.6
Male	5,374	54.5%	224.1	204.5
Race/Ethnicity				
Non-Hispanic White	10,998	93.2%	231.6	156.5
Non-Hispanic African American	566	4.8%	141.7	224.1
Non-Hispanic Native American	58	0.5%	101.5	121.0
Non-Hispanic Asian/Pacific Islander	73	0.6%	41.8	87.2
Hispanic	111	0.9%	27.9	76.0
DHS Region				
Northeastern	2,726	23.1%	218.8	159.2
Northern	1,222	10.3%	250.3	162.9
Southeastern	4,245	35.9%	200.1	164.4
Southern	2,039	17.3%	179.7	144.3
Western	1,581	13.4%	200.4	152.3

HEART DISEASE MORTALITY

The leading cause of heart disease death is ischemic heart disease (blockage of coronary vessels followed by myocardial infarction) followed by hypertensive heart disease (effect of high blood pressure). Ischemic heart disease constituted 46.8 percent of all heart disease deaths for females, while it represented 62.8 percent of all heart disease deaths for males. Other types of heart disease represented 28.1 percent of all heart disease deaths in males and 39.5 percent in females (Figure 9a). The total number of hypertensive deaths continues to increase, and in the last year increased 5 percent (from 791 to 831). In the last 10 years, hypertensive deaths have increased 70 percent, increasing more sharply for men (from 200 deaths in 2008 to 393 in 2017) than for women (from 289 in 2008 to 441 in 2017).

Figure 9a. Percent of heart disease deaths by type and sex, 2017

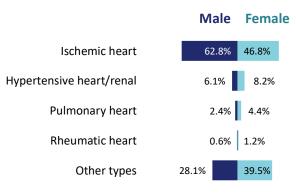
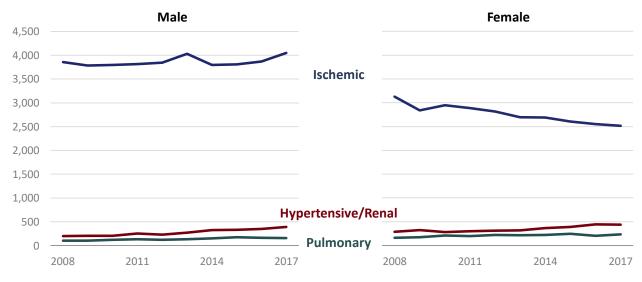


Table 4. Number of heart disease deaths and percent distribution by heart disease type and sex, 2017

Heart disease types	Male	Female	Total deaths
Ischemic heart	4,048	2,513	6,561
Hypertensive heart/renal	393	441	834
Pulmonary heart	154	236	390
Rheumatic heart	36	63	99
Other types	1,810	2,121	3,931
Total	6,441	5,374	11,815

Ischemic heart disease deaths in males decreased from 2003 to 2007, but have since increased, with a 7 percent increase in the last three years. Conversely, in the last 10 years, ischemic heart disease has decreased almost 20 percent for females, with a 6 percent decrease in just the last three years.



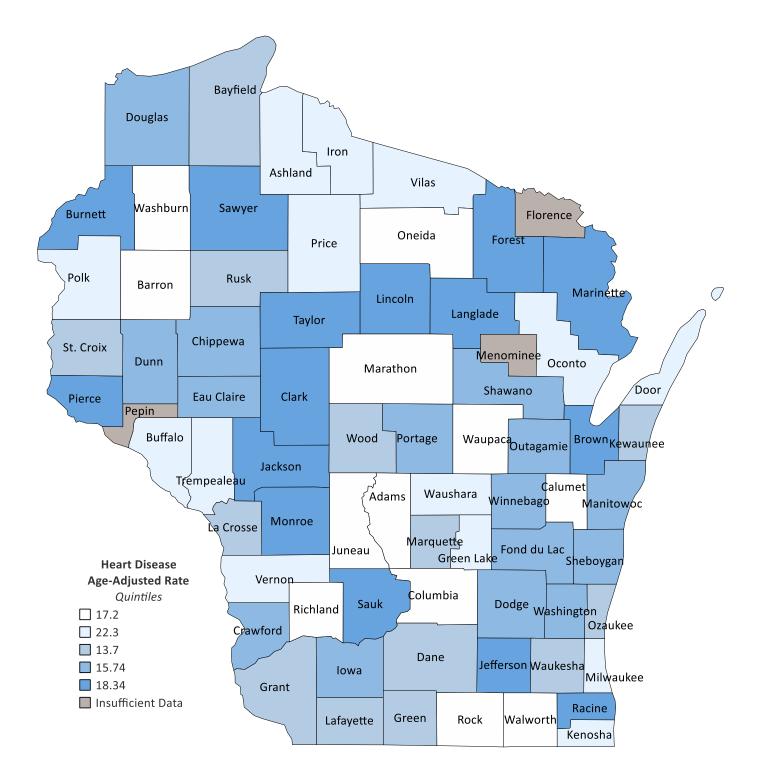


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HEART DISEASE MORTALITY

The highest age-adjusted heart disease mortality rates were in Oconto (22.3 per 10,000 people), Green Lake (21.4 per 10,000 people), and Vilas (21.0 per 10,000 people) counties. The three counties with the lowest heart disease mortality rates were St. Croix, Rusk, and Kewaunee (Map 2). Overall, the southeastern region has the highest age-adjusted rate of heart disease at 16.4 per 10,000.





CANCER MORTALITY

Cancer mortality in the U.S. and Wisconsin continued to decrease in 2017 (Figure 10). There were 11,287 cancer deaths in Wisconsin in 2017, which is slightly more than in 2008 (11,120). However, age-adjusted cancer mortality rates declined during this period, from 176.1 per 100,000 in 2008 to 153.1 in 2017.

Cancer mortality rates were highest among those 65 and older, constituting 74 percent of all cancer deaths in 2017 (Table 5). Males experienced a 16 percent higher cancer mortality rate of 210.2 per 100,000 compared to 180.6 in females (Table 5).

Figure 10. Age-adjusted rate of cancer deaths for the United States and Wisconsin



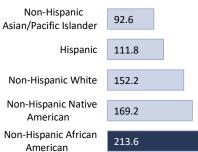
Demographics	Total Deaths	Percent of Deaths	Crude mortality rate per 100,000 population	Age-adjusted rate per 100,000 population
Age				
Less than 5	8	0.1%	2.4	N/A
5 to 17	19	0.2%	2.0	N/A
18 to 25	16	0.1%	2.9	N/A
26 to 64	2,876	25.5%	96.1	N/A
65 and older	8,368	74.1%	879.2	N/A
Sex				
Female	5,244	46.5%	180.6	131.0
Male	6,043	53.5%	210.2	183.6
Race/Ethnicity				
Non-Hispanic White	10,368	91.9%	218.3	152.2
Non-Hispanic African American	565	5.0%	141.4	213.6
Non-Hispanic Native American	83	0.7%	145.2	169.2
Non-Hispanic Asian/Pacific Islander	80	0.7%	45.8	92.6
Hispanic	183	1.6%	46.0	111.8
DHS Region				
Northeastern	2,467	21.9%	198.0	146.8
Northern	1,105	9.8%	226.3	149.1
Southeastern	3,985	35.3%	187.9	157.3
Southern	2,063	18.3%	181.8	148.4
Western	1,666	14.8%	211.2	163.2

Table 5. Number of cancer deaths, crude rates, and age-adjusted rates by demographics, 2017

CANCER MORTALITY

Cancer rates vary by race. African Americans and Native Americans had the highest age-adjusted cancer mortality rates, followed by Whites. The cancer age-adjusted mortality rates increased 11 percent for NH African Americans in the last year. Native Americans and Hispanics also saw slight (5 percent) increases in age-adjusted cancer mortality rates. Whites and Asians had decreases in age-adjusted rates from 2016 to 2017.

Figure 11a. Age-adjusted cancer death rate by race and ethnicity, 2017



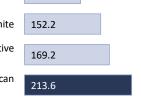
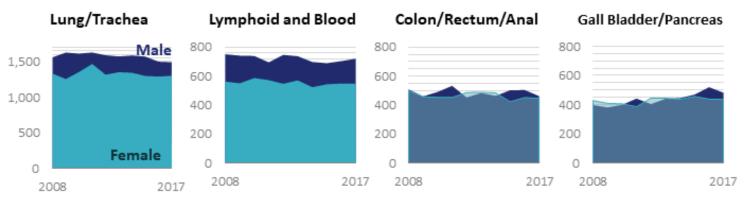


Figure 11b. Number of cancer deaths, by type



Lung and tracheal cancers continued to be the leading cause of cancer deaths for males and females, constituting 25 percent of all cancer deaths. Both males and females experienced a slight decrease in lung/ trachea cancer from 2008 to 2017 (from 1,560 deaths to 1,491 deaths for men and from 1,332 deaths to 1,302 deaths for women).

Lymphoid and blood cancers (such as leukemia) were the second leading cause of cancer deaths among males (12 percent), followed by prostate (11 percent), and gallbladder/pancreas cancers (8 percent). Gall bladder and pancreatic cancer deaths have remained stable in females, though have increased over the past decade in males. Males had a 21 percent increase in gall bladder and pancreas cancer from 2008 to 2017 (397 to 482 deaths). Colon, rectum, and anal cancer deaths decreased by around 10 percent for both males and females in the last 10 years.

For females, breast cancer was the second leading cause of cancer death (13 percent) followed by cancers of the reproductive organs (11 percent) and lymphoid and blood cancers (11 percent). The number of deaths from breast cancer have decreased (6 percent) for women in the last 10 years (from 715 to 677).

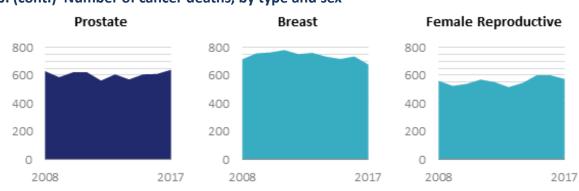


Figure 11b. (cont.) Number of cancer deaths, by type and sex

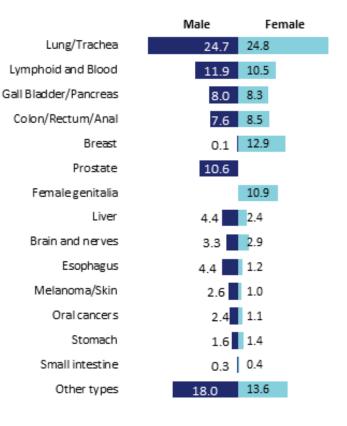
Table 6. Number of cancer deaths by cancer type and sex, 2017

Cancer types	Ма	le	Fem	ale	All cancer deaths
	N	%	N	%	
Lung/Trachea	1,491	24.7%	1,302	24.8%	2,793
Lymphoid and Blood	721	11.9%	549	10.5%	1,270
Gall Bladder/Pancreas	482	8.0%	436	8.3%	918
Colon/Rectum/Anal	462	7.6%	447	8.5%	909
Breast	8	0.1%	677	12.9%	685
Prostate	640	10.6%	-	-	640
Female genitalia	-	-	574	10.9%	574
Liver	267	4.4%	126	2.4%	393
Brain and nerves	198	3.3%	151	2.9%	349
Esophagus	268	4.4%	64	1.2%	332
Melanoma/Skin	157	2.6%	53	1.0%	210
Oral cancers	144	2.4%	59	1.1%	203
Stomach	98	1.6%	72	1.4%	170
Small intestine	21	0.3%	19	0.4%	40
Other types	1,086	18.0%	715	13.6%	1,801
Total	6,043	100.0%	5,244	100.0%	11,287

Almost one quarter of all deaths due to cancer were from lung or tracheal cancers. Following that, cancers of the lymphoid and blood accounted for 11 percent of all cancer deaths in 2017. The number of cancer deaths remained fairly steady for most types of cancer, though from 2016 to 2017 there was an 8 percent decrease in breast cancer (from 748 to 685 deaths). There was an 11 percent decrease in the number of liver cancer deaths (440 to 393) in the last year, and a 15 percent decrease in the number of melanoma and skin cancers (246 to 210).

The number of cancer deaths also is fairly stable across sex, with a similar number of deaths from the top five cancer deaths. However, there were twice as many male liver cancer deaths in 2017 compared to female liver cancer deaths (267 compared to 126). Men also died more frequently from cancer of the esophagus than did women (268 compared to 64).

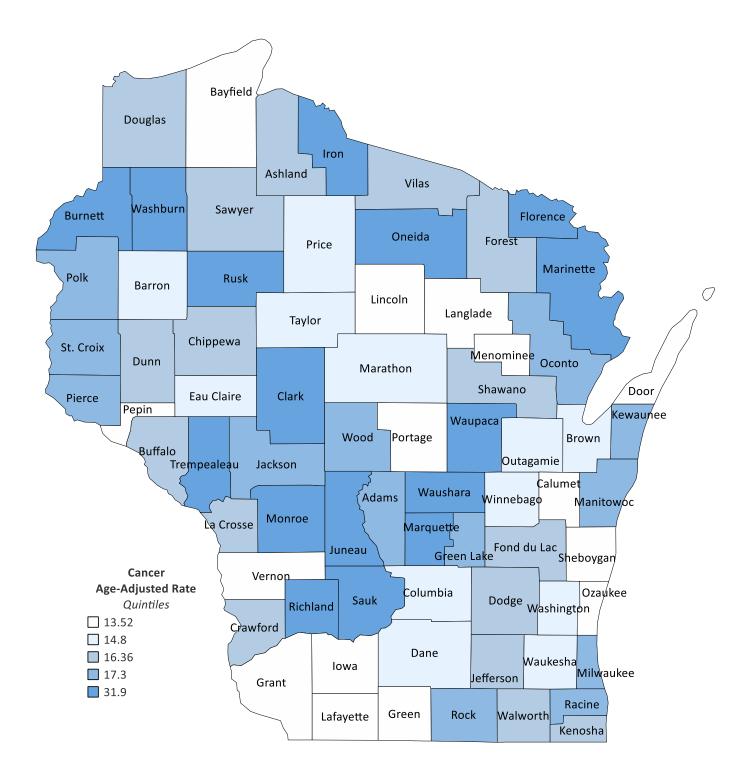
Figure 11c. Percent of cancer deaths by cancer type and sex, 2017



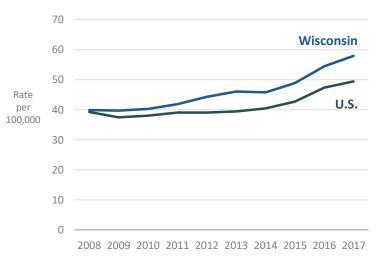
CANCER MORTALITY

The age-adjusted cancer mortality rates were highest in Florence, Burnett, and Clark counties in 2017. The age-adjusted cancer mortality rates were lowest in Iowa, Pepin, and Calumet counties (Map 3).





Unintentional injuries remained the leading cause of death among people aged 1-44 and the third leading cause of death overall (Table 2). The total number of unintentional injury deaths in Wisconsin has been increasing since 2009. Wisconsin's ageadjusted unintentional injury mortality rates have been higher than the U.S. rate for the past 10 years (Figure 12), with a widening gap; Wisconsin had a 17 percent higher mortality rate for unintentional injury compared to the U.S. in 2017 (57.9 versus 49.4 per 100,000).



The age-adjusted mortality rate for males was 43 percent higher than for females. NH Native Americans had the highest age-adjusted mortality rates compared to all other racial and ethnic groups. When looking by region, the southern and southeastern regions had the highest unintentional injury mortality rates.

Demographics	Total deaths	Percent of deaths	Crude rate per 100,000 population	Age-adjusted rate per 100,000 population
Age				
Less than 5	35	0.9%	10.4	N/A
5 to 17	53	1.4%	5.6	N/A
18 to 25	248	6.7%	44.9	N/A
26 to 64	1,611	43.5%	53.8	N/A
65 and older	1,760	47.5%	184.9	N/A
Sex				
Female	1,556	42.0%	53.6	42.1
Male	2,151	58.0%	74.8	73.8
Race/Ethnicity				
Non-Hispanic White	3,212	86.6%	67.6	56.9
Non-Hispanic African American	277	7.5%	69.3	81.0
Non-Hispanic Native American	52	1.4%	91.0	94.3
Non-Hispanic Asian/Pacific Islander	34	0.9%	19.5	28.1
Hispanic	129	3.5%	32.4	46.2
DHS Region				
Northeastern	724	19.5%	58.1	50.7
Northern	274	7.4%	56.1	46.3
Southeastern	1,520	41.0%	71.7	66.6
Southern	742	20.0%	65.4	59.6
Western	445	12.0%	56.4	51.0

Table 7. Number of unintentional injury deaths and age-adjusted rates by demographics, 2017

Figure 12. Age-adjusted rate of unintentional injury deaths for the United States and Wisconsin

UNINTENTIONAL INJURY MORTALITY

In 2017, the leading causes of death due to unintentional injuries were falls, poisoning, motor vehicle crashes, suffocation, drowning, and fire. Beginning in 2011, poisoning deaths surpassed motor vehicle crashes as the second leading cause of unintentional injury deaths. Poisoning refers to the ingestion of any natural or synthetic toxic substance (plant, metal, gaseous, venom, or other chemical byproducts/medicines), either by mouth, by skin contact, inhalation, or parental injection, that interferes with normal body functions. Additional information about poisonings can be found in the Drug Overdose Deaths section of this report.

Cause of injury	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Fall	918	954	978	1,026	1,091	1,166	1,211	1,342	1,483	1,539
Poisoning	481	515	507	580	615	748	752	774	970	1,092
Motor Vehicle Crash (MVC)	581	531	567	566	566	547	486	569	600	599
Suffocation	101	94	94	99	103	93	120	104	98	100
Drowning	59	49	65	60	61	52	43	60	48	54
Fire/Flame	46	44	38	43	53	46	44	47	40	44
All others	257	245	247	241	300	275	284	290	263	279
Total	2,443	2,432	2,496	2,615	2,789	2,927	2,940	3,186	3,502	3,707

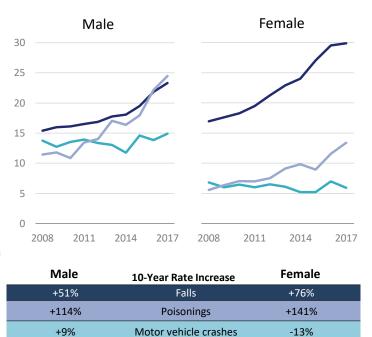
Table 8. Number of unintentional injury deaths, 2008-2017

There were 1,539 deaths due to falls, 56 percent of which were women; 1,092 poisonings (36 percent women); and 599 motor vehicle crashes (29 percent women). The age-adjusted death rates show significant differences by sex as well.

In 2016, the male age-adjusted death rate for poisonings overtook falls as the leading cause of unintentional injuries, and the rate continued to increase in 2017, more than doubling in the past 10 years.

Among females, falls have been the leading cause of unintentional injury deaths for the past 10 years, and the rate continues to increase, going up 76 percent in the same time period. In 2017, females had a 28 percent higher age-adjusted mortality rate for falls than males.

Figure 13. Age-adjusted rate for unintentional injury death (external causes) and 10-year rate increase, by injury type and sex



UNINTENTIONAL INJURY MORTALITY

Table 9 presents the number and percent distribution of physical and anatomical locations of injuries that resulted in death. Twenty-four percent of unintentional injury deaths were due to multiple injuries. Head and neck injuries represented 16 percent of all unintentional injury deaths, and, stratified by sex, represented the second leading type of unintentional injury deaths for males. Lower extremity injuries were the second leading type of unintentional injuries among females. Drug overdose deaths are included in the "Other" category. However, drug overdose deaths are examined in more detail in the next section of this report.

Injury Location	Ma	Male		Female		Total	
	Ν	%	Ν	%	N	%	
Multiple Injuries	507	23.6%	391	25.1%	898	Multiple Injuries (24%)	
Head/Neck	374	17.4%	202	13.0%	576	Head/Neck (16%)	
Lower Extremities	142	6.6%	298	19.2%	440	Lower Extremities (12%)	
Chest	40	1.9%	26	1.7%	66	Chest (2%)	
Abdomen/Spine/Pelvis	19	0.9%	45	2.9%	64	Abdomen/Spine/Pelvis (2%)	
Upper Extremities	7	0.3%	20	1.3%	27	Upper Extremities (1%)	
Other/Foreign/Frostbite	1062	49.4%	574	36.9%	1,636	Other/Foreign/Frostbite (44%)	
Total	2,151	100.0%	1,556	100.0%	3,707		

Table 9. Number of unintentional injury deaths by injury location and sex, 2017

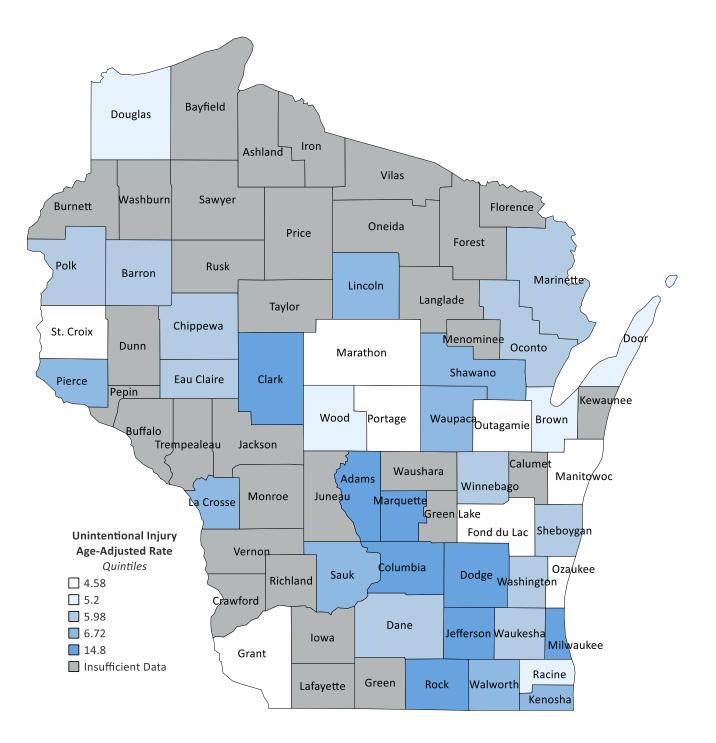
From 2008 to 2017, deaths from multiple injuries increased by 50 percent from 596 deaths to 898 deaths. The large increase seen in the "Other" category is likely due to drug overdose deaths being included in this group. Lower extremity injury deaths had a relatively consistent increase over time, though they decreased in 2017 (Table 10). Head and neck injury deaths increased by 18 percent over the past 10 years.

Table 10. Number of unintentional injury deaths by injury location, 2007-2017

Injury Location	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Multiple Injuries	596	597	587	637	642	649	616	717	826	898
Head/Neck	488	472	512	515	544	603	530	547	571	576
Lower Extremities	343	349	350	347	392	383	435	460	475	440
Chest	75	56	63	56	59	53	61	81	57	66
Abdomen/Spine/Pelvis	46	41	45	39	62	53	48	55	57	64
Upper Extremities	20	8	17	16	26	23	19	30	35	27
Other/Foreign/Frostbite	875	909	922	1,005	1,064	1,163	1,231	1,296	1,481	1,636
Total	2,443	2,432	2,496	2,615	2,789	2,927	2,940	3,186	3,502	3,707

In 2017, the highest unintentional injury mortality rates were in Marquette, Adams, and Columbia counties. The lowest reliable unintentional injury mortality rates were in Grant, Portage, and St. Croix counties (Map 4).

Map 4. Age-adjusted mortality rate (per 10,000) for unintentional injury cause of death by county, 2017

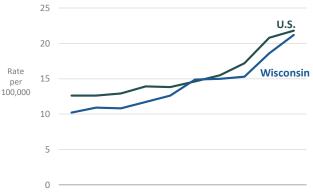


Drug overdose deaths continue to increase in Wisconsin and disproportionately affect working-age adults, males, and Non-Hispanic African Americans.

A drug overdose is a poisoning by drugs or medicine, legally or illegally, taken in a higher amount than normally used or prescribed. These drugs are byproducts of or chemically similar to naturally occurring substances. For example, morphine is a byproduct of opium (opiate), harvested from naturally occurring poppy plants, while oxycodone is semi-synthetic (opioid) in which the chemical structure resembles and acts

like morphine. The drug overdose death epidemic continues in the U.S. and Wisconsin. Overall in Wisconsin, the age-adjusted rates of drug overdose deaths is 21.2, having doubled (107 percent increase) from 2008 to 2017 (Figure 14). Drug overdose deaths increased by over 10 percent in the past year, from 1,031 deaths in 2016 to 1,171 deaths in 2017, with a 14 percent increase in the age-adjusted mortality.

Figure 14. Age-adjusted rate of drug overdose deaths for the United States and Wisconsin



2008 2009 2010 2011 2012 2013 2014 2015 2016 2017

Demographics	Total deaths	Percent of deaths	Crude rate per 100,000 population	Age-adjusted rate per 100,000 population
Age				
Less than 5	<5	-	-	N/A
5 to 17	<5	-	-	N/A
18 to 25	119	11.8%	21.6	N/A
26 to 64	993	82.1%	33.2	N/A
65 and older	52	5.0%	5.5	N/A
Sex				
Female	431	36.8%	14.8	15.4
Male	740	63.2%	25.7	26.7
Race/Ethnicity				
Non-Hispanic White	928	79.2%	19.5	20.7
Non-Hispanic African American	137	11.7%	34.3	38.6
Non-Hispanic Native American	33	2.8%	57.7	59.6
Non-Hispanic Asian/Pacific Islander	8	0.7%	4.6	3.8
Hispanic	63	5.4%	15.8	16.5
DHS Region				
Northeastern	176	15.1%	14.1	15.0
Northern	58	5.0%	11.9	13.2
Southeastern	607	51.9%	28.6	29.4
Southern	227	19.4%	20.0	20.6
Western	101	8.6%	12.8	13.4

Table 11. Number of drug overdose deaths and age adjusted rates by demographics, 2017

The demographic distribution for drug overdose deaths shows that working-age adults experienced a higher burden of drug overdose deaths. The drug overdose mortality rate was six times higher among people ages 26-64 compared to the 65 and older age group, and a third higher compared to those in the 18- to 25-year-old age group. The death rate for those aged 26-64 increased 18 percent since 2016. Males experienced 73 percent higher age-adjusted mortality rates for drug overdose than females, and the male rate increased 14 percent since 2016. African Americans had a higher age-adjusted mortality rate for drug overdose compared to Whites, and Native Americans have the highest mortality rate. The Southeastern region continues to have the highest age-adjusted mortality rate in the state.

Figure 15. Number of drug overdose deaths and age-adjusted rates by demographics, 2017

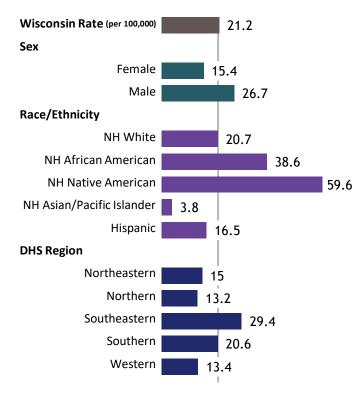
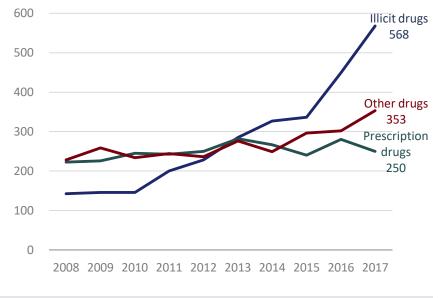


Figure 16. Number of drug overdose deaths by type of drug

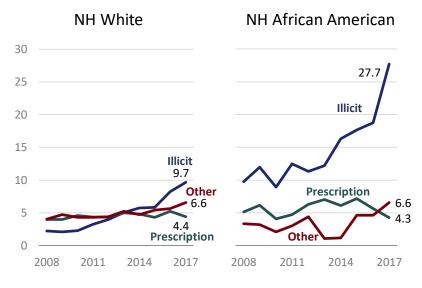
Illicit drugs (heroin and cocaine) were the leading cause of drug overdose deaths followed by other drugs, including fentanyl. Before 2012, illicit drugs were the third leading cause of drug overdose deaths in Wisconsin, but they have been steadily increasing each year since then. After 2013, illicit drug deaths surpassed other types of drug deaths and became the leading cause of drug overdose deaths. Illicit drug deaths increased 27 percent in the last year. Other drug deaths have been increasing since 2014, and increased 17 percent from 2016 to 2017.



Illicit Drugs	Opium, heroin, and cocaine
Prescription Drugs*	Natural and semi-synthetic opioids e.g. codeine, methadone
Other Drugs*	Fentanyl and synthetic opioids, stimulants, benzodiazepines, and unspecified drugs

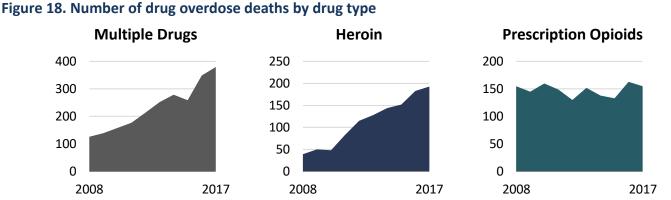
* All data in this table have been updated to reflect the new classification of synthetic opioids as "Other Drugs" not "Prescription Drugs."

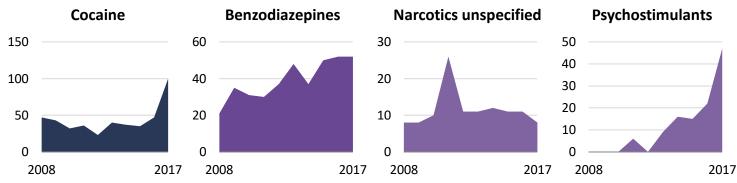




In 2017, there were 137 drug overdose deaths to African Americans, with a death rate of 38.6, almost twice as high as that for Whites. For illicit drugs, the drug overdose mortality rate for Whites increased 18 percent. However, among African Americans, the increase was 48 percent, almost doubling. From 2008 to 2017, other drug mortality rates increased by 63 percent among Whites. During this same time, the rate of drug overdose deaths for other drugs increased by 97 percent for African Americans, nearly doubling.

There continued to be a sharp increase in drug overdose deaths from multiple drugs, up 9 percent in the last year and over 200 percent in the past 10 years. There was a slight increase in heroin deaths in the past year; over the past 10 years, heroin deaths have tripled. Deaths due to prescription drugs (not including fentanyl) have been relatively stable, though they remain in the top three drug-related deaths. Finally, deaths due to cocaine and other psychostimulants have increased; cocaine deaths have more than doubled from 40 in 2013 to 100 in 2017, and other psychostimulant deaths have guadrupled from under 10 in 2013 to 47 in 2017 (Figure 18).





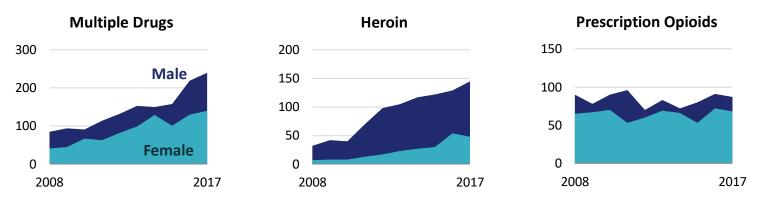
Drug Type	Male		Female		Total			
	Ν	%	N	%	Ν	%		
Multiple Drugs	240	32%	140	32%	380	Multiple Drugs (32%)		
Heroin	145	20%	48	11%	193	Heroin (16%)		
Prescription Opioids	87	12%	68	16%	155	Prescription Opioids (13%)		
Cocaine	67	9%	33	8%	100	Cocaine (9%)		
Benzodiazepines	26	4%	26	6%	52	Benzodiazepines (4%)		
Psychostimulants	29	4%	18	4%	47	Psychostimulants (4%)		
Narcotics Unspecified	<5	-	<5	-	8	Narcotics Unspecified (1%)		
Unknown	142	19%	94	22%	236	Unknown (20%)		
Total	740	100.0%	431	100.0%	1,171	100.0		

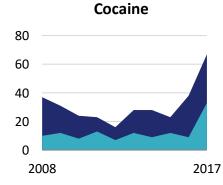
Table 12. Number of drug overdose deaths by drug type and sex, 2017

For both males and females, death from multiple drugs was the leading cause of drug death. Heroin alone was the second leading cause of drug death for males and the third leading cause for females (20 percent vs. 11 percent). However, prescription opioid-only deaths made up a greater proportion of the overdose deaths for females than males (16 percent vs. 12 percent) (Table 12). Nearly two-thirds of all drug overdose deaths in 2017 were male.

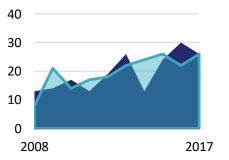
Looking at the trend over time, the total number of drug overdose deaths, particularly from multiple drugs, heroin alone, and cocaine alone, have been on the rise for both males and females. These deaths are rising faster for males than females. The number of deaths due to prescription opioids alone were relatively stable in Wisconsin in both males and females (Figure 19).

Figure 19. Number of drug overdose deaths, by type and sex

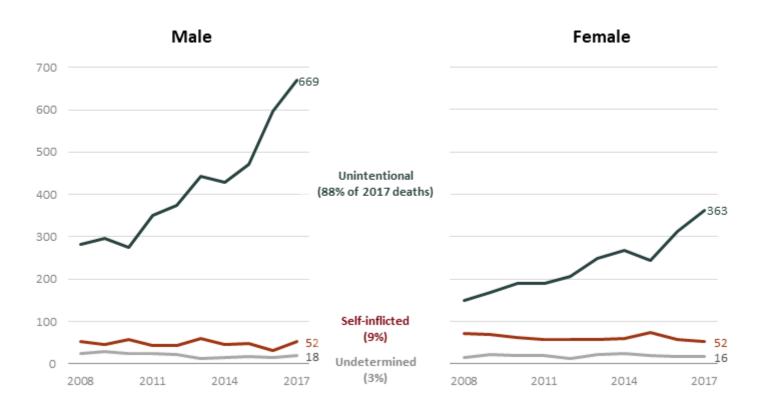










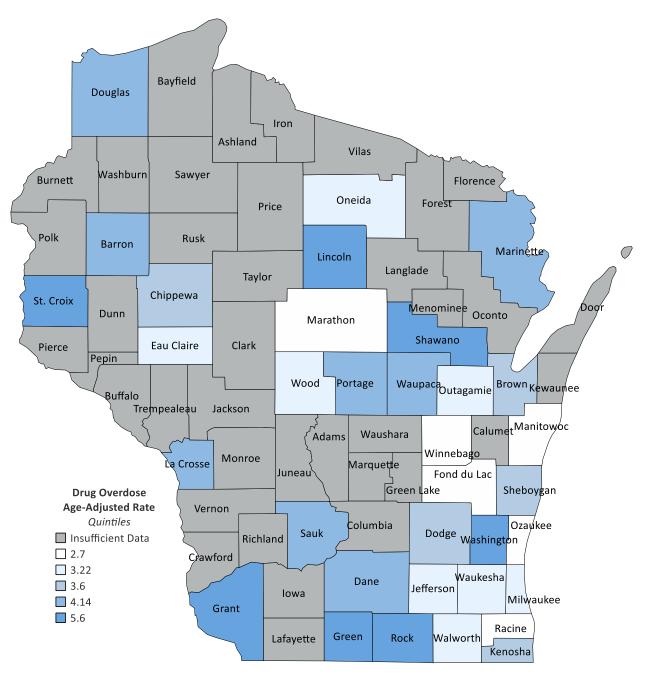


The vast majority (88 percent) of drug overdose deaths are unintentional, with only one in 11 deemed purposeful and self-inflicted. Over the past 10 years, the number of unintentional drug overdose deaths have significantly increased for both males and females. There were 281 unintentional drug overdose deaths for males in 2008 and 669 in 2017, a 138 percent increase. For females, there were 149 deaths in 2008 and 363 in 2017, a 144 percent increase. In just the past year, Wisconsin had 12 percent more unintentional drug deaths for males and 16 percent more for females. Among males, there was no change in the number of self-inflicted drug overdose deaths (suicide) over the last decade, though female suicides by drug overdose decreased by about one quarter (Figure 20).

In 2017, the highest drug overdose mortality rates were in St. Croix, Lincoln, and Shawano counties. The lowest mortality rates were seen in Ozaukee, Manitowoc, and Fond du Lac counties (Map 5).

In 2016, there were 30 counties with under five drug overdose deaths. By 2017, there were only seven counties with fewer than five drug overdose deaths including Buffalo, Iowa, Iron, Menominee, Pepin, Richland, and Rusk. All counties in Wisconsin are effected by this drug overdose epidemic.

Map 5. Age-adjusted mortality rate (per 10,000) for drug overdose cause of death by county, 2017



Just over 8 percent of Wisconsin residents receive an autopsy after death.

Autopsies were more likely to be performed on younger people (41 percent of children aged 0 to 5; 54 percent of those aged 5 to 17; and 72 percent of those aged 18 to 25) compared to people aged 65 and older (2 percent). A higher proportion of children and youth received autopsies in 2017 compared to 2016 (up 3.3 percent for children under 5 and 4.9 percent for children 5-17.) The proportion of autopsies performed was higher among males (11 percent) than among females (5 percent), and higher among African Americans (22 percent), Hispanics (23 percent), and Native Americans (16 percent) than among Asians (12 percent) and Whites (7%) (Table 13).

Demographics	No Autopsy	Autopsy	Total					
Age								
Less than 5	279	191	470					
5 to 17	79	93	172					
18 to 25	141	368	509					
26 to 64	7,992	2,883	10,875					
65 and Older	39 <i>,</i> 887	766	40,653					
Education	Education							
High School Degree or Less	32,052	2676	34,728					
Associates, Bachelor Degree, or Some College	13,300	1382	14,682					
Graduate Degree	2,457	152	2,609					
Sex								
Male	23,882	2,986	26,868					
Female	24,496	1,315	25,811					
Race/ethnicity								
Non-Hispanic White	44,795	3,365	48,160					
Non-Hispanic African American	2,180	612	2,792					
Non-Hispanic Native American	361	68	429					
Non-Hispanic Asian and Pacific Islander	355	49	404					
Hispanic	662	195	857					
Total	48,378	4,301	52,679					

Table 13. & Figure 21. Number and percent of autopsies performed by demographics, 2017

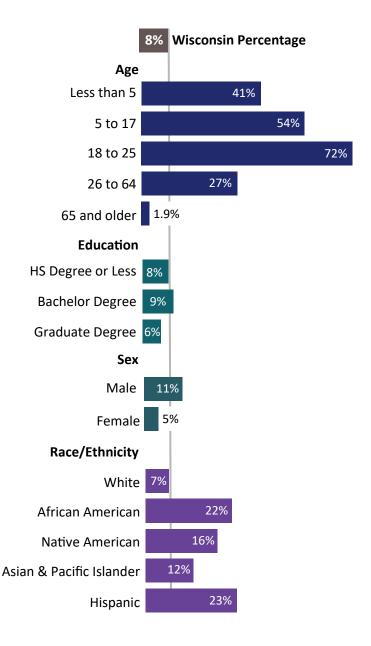


Table 14. Number and percent of autopsies performed by leading causes of death, intent, and causes of injury, 2017

Cause of Death	No autopsy	Autopsy	Total	Percent	
By leading causes					
Heart disease	11,050	765	11,815	6.5%	
Cancer	11,169	118	11,287	1.0%	
Unintentional injury	2,039	1,668	3,707	45.0%	
By injury intent					
Self-inflicted (suicide)	334	581	915	63.5%	
Assault (homicide)	6	197	203	97.0%	
Undetermined	10	55	65	84.6%	
Legal/war	0	17	17	100.0%	
By selected causes of injury					
Fall	1,435	121	1,556	7.8%	
Poisoning	178	1,087	1,265	85.9%	
Firearm	184	437	621	70.4%	
Motor vehicle crash (MVC)	232	367	599	61.3%	
Suffocation	152	228	380	60.0%	
Drowning	16	54	70	77.1%	
Fire/flame	16	41	57	71.9%	
All other	176	183	359	51.0%	
Total injury causes	2,389	2,518	4,907	51.3%	
Total	48,378	4,301	52,679	8.2%	

Autopsies were more likely to be performed in the case of injuries, with 45 percent of unintentional injury deaths receiving autopsies, 97 percent of homicide and assault cases, and 64 percent of self-inflicted injury deaths (Table 14). Autopsies also occurred more frequently in deaths due to poisoning (86 percent), fire (72 percent), drowning (77 percent), firearms (70 percent), or motor vehicle crashes (MVC; 61 percent).

Cremation continues to be the predominant way of disposition of bodies compared to burials.

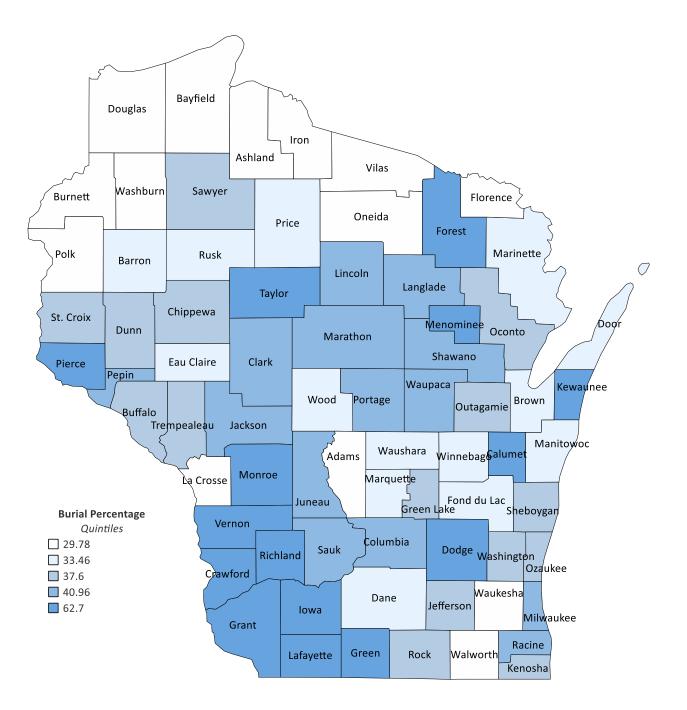
Table 15 shows the number and percent of body disposition by demographics, education, marital status, and region of residence. Of the 52,679 deaths in 2017, 59.1 percent were cremated, a slight increase from the 57 percent cremated in 2016. This continues the trend of an increased percentage of deaths being cremated. The proportion of decedents who were cremated was higher among those aged 18 to 64. Among males, about 63 percent of decedents were cremated compared to 55 percent among females. Whites and Hispanics had the highest proportion of decedents cremated compared to other race and ethnicity categories. African Americans had the lowest proportion of decedents cremated followed by Asians. Decedents with an education level higher than high school were more likely to be cremated compared to those with less than a high school education.

Table 15. Disposition of bodies by demographics, 2017

Characteristic	Burial		Cremation		Dona	Donation		Entombment		Other	
	Ν	%	Ν	%	Ν	%	Ν	%	Ν	%	N
Age											
Less than 5	204	43.4%	260	55.3%	0	0.0%	<5	0.2%	5	1.1%	470
5 to 17	77	44.8%	94	54.7%	0	0.0%	0	0.0%	<5	0.6%	172
18 to 25	176	34.6%	324	63.7%	0	0.0%	6	1.2%	<5	0.6%	509
25 to 64	2,586	23.8%	8,108	74.6%	36	0.3%	129	1.2%	16	0.1%	10,875
65 and Older	15,585	38.3%	22,347	55.0%	277	0.7%	2,388	5.9%	56	0.1%	40,653
Sex											
Male	8,602	32.0%	16,974	63.2%	160	0.6%	1,076	4.0%	56	0.2%	26,868
Female	10,026	38.8%	14,159	54.9%	153	0.6%	1,448	5.6%	25	0.1%	25,811
Race and Ethnicity											
Non-Hispanic White	16,221	33.7%	29,166	60.6%	310	0.6%	2,397	5.0%	66	0.1%	48,160
Non-Hispanic African		56.494			_	0.00/			4.0	a	
American	1,574	56.4%	1119	40.1%	<5	0.0%	88	3.2%	10	0.4%	2,792
Non-Hispanic Native American	209	48.7%	215	50.1%	0	0.0%	<5	0.9%	<5	0.2%	429
Non-Hispanic Asian and Pacific Islander	228	56.4%	169	41.8%	0	0.0%	6	1.5%	<5	0.2%	404
Hispanic	380	44.3%	447	52.2%	<5	0.2%	28	3.3%	0	0.0%	857
Other	16	43.2%	17	45.9%	0	0.0%	<5	2.7%	<5	8.1%	37
Education											
High School Degree or Less	13,237	38.1%	19,409	55.9%	153	0.4%	1,884	5.4%	45	0.1%	34,728
Associates, Bachelor Degree or Some College	4,353	29.6%	9,641	65.7%	114	0.8%	545	3.7%	29	0.2%	14,682
Graduate Degree	741	28.4%	1,731	66.3%	45	1.7%	85	3.3%	7	0.3%	2,609
Unknown	297	45.0%	352	53.3%	<5	0.2%	10	1.5%	0	0.0%	660
Marital Status											
Single	2,567	35.5%	4,467	61.9%	26	0.4%	148	2.0%	13	0.2%	7,221
Married	6,016	31.8%	11,891	62.8%	131	0.7%	852	4.5%	37	0.2%	18,927
Divorced	1,567	20.5%	5,891	77.0%	57	0.7%	122	1.6%	10	0.1%	7,647
Widowed	8,416	44.9%	8,792	46.9%	99	0.5%	1,402	7.5%	19	0.1%	18,728
Unknown	62	40.0%	91	58.7%	0	0.0%	0	0.0%	<5	1.3%	155
DHS Region											
Northeastern	4,029	33.9%	6,917	58.2%	63	0.5%	858	7.2%	15	0.1%	11,882
Northern	1,729	33.8%	3,232	63.3%	16	0.3%	116	2.3%	15	0.3%	5,108
Southeastern	6,805	36.0%	10,616	56.2%	142	0.8%	1,314	7.0%	23	0.1%	18,900
Southern	3,646	38.6%	5,560	58.9%	53	0.6%	172	1.8%	15	0.2%	9,446
Western	2,417	33.0%	4,795	65.5%	39	0.5%	64	0.9%	11	0.2%	7,326
Unknown	<5	11.8%	13	76.5%	0	0.0%	0	0.0%	<5	11.8%	17
Total	18,628	35.4%	31,133	59.1%	313	0.6%	2,524	4.8%	81	0.2%	52,679

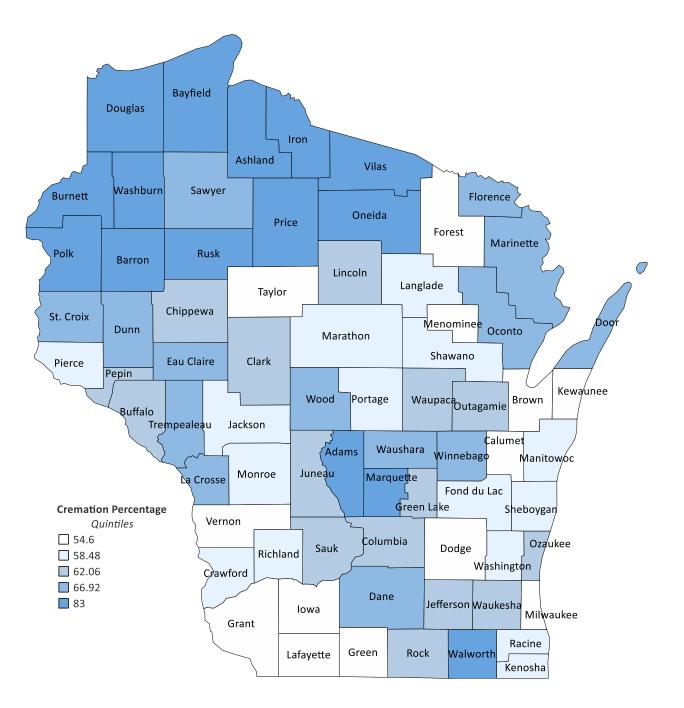
The counties of Lafayette (62.7 percent), Grant (55.4 percent), and Vernon (53.9 percent) had the highest percentage of decedents buried in 2017.

Map 6. Percent distribution of burials by county, 2017



When looking at the percent of cremation by county in 2017, the three highest counties were Iron (83 percent), Bayfield (81 percent), and Oneida (78 percent). This remains consistent with 2016. The counties with the lowest percentage of decedents cremated were Lafayette (36 percent), Grant (44 percent), and Kewaunee (36 percent).





Suggested citation:

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Wisconsin Department of Health Services