# Annual Wisconsin Death Report



September 2016 Release

Wisconsin Department of Health Services Division of Public Health Office of Health Informatics 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, 2015,* 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 <a href="http://dhs.wisconsin.gov/stats/">http://dhs.wisconsin.gov/stats/</a>. Wisconsin Interactive Statistics on Health (WISH) is an online data query system, located at <a href="http://dhs.wisconsin.gov/wish">http://dhs.wisconsin.gov/wish</a>, which includes death data for multiple years and geographic areas in Wisconsin. Technical notes are available at <a href="https://www.dhs.wisconsin.gov/stats/">https://www.dhs.wisconsin.gov/stats/</a>. *deaths/index.htm*.

This publication was prepared by the Office of Health Informatics, Division of Public Health, in the Wisconsin Department of Health Services. The findings in this report were compiled by Karl Pearson and Ousmane Diallo in the Office of Health Informatics. Draft review was provided by staff in the Bureau of Community Health Promotion, Division of Public Health. The report was prepared under the supervision of Oskar Anderson, Director of the Office of Health Informatics; Lisa Walker, State Registrar of Vital Records; and Milda Aksamitauskas, Section Chief, Health Analytics Section.

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Karl Pearson, Research Scientist-Demographer Office of Health Informatics Division of Public Health 1 W Wilson St, Rm 118 Madison, WI 53701 Telephone: 608-266-1920 Email: Karlt.Pearson@dhs.wisconsin.gov This report presents information about deaths that occurred in 2015 among Wisconsin residents. Information from previous years 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."<sup>1</sup> State rates in the report are age-adjusted rates per 100,000 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 changes.

This report uses resident death certificate files. 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.

<sup>1</sup> http://www.who.int/topics/mortality/en/

There were 51,251 deaths of Wisconsin residents in 2015. This is a 2 percent increase from the 50,136 deaths recorded in 2014.

In 2015, there were 51,251 deaths of Wisconsin residents, 1,114 more than in 2014. Since 2011, the number of deaths increased 7 percent from over 48,100 in 2011 up to 51,251 in 2015.

In 2015, the Wisconsin crude death rate was 891.6 deaths per 100,000 population, unchanged from 2013 and 2014. The age-adjusted death rate was 725.9 per 100,000. Until 2009, age-adjusted mortality rates were decreasing in Wisconsin. During that time, Wisconsin had a 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 about the same as the national rate (Figure 1).



Figure 1. Total number of deaths and age-adjusted rates 2005-2015, Wisconsin

Source: Office of Health Informatics, Division of Public Health, Wisconsin Department of Health Services. Note: U.S. rates for 2015 were not available. Stratified by gender, the 2015 age-adjusted mortality rates in Wisconsin were the same as national rates. Males had a higher mortality rate than females. The risk of dying, when adjusted for age, was 40 percent higher among males than females. The same finding held true when comparing males and females at the national level. From 2005 to 2015, the age-adjusted mortality rate difference between males and females, for both Wisconsin and the U.S., narrowed (Figure 2).





Source: Office of Health Informatics, Division of Public Health, Wisconsin Department of Health Services. Note: U.S. rates for 2015 were not available.

Age-adjusted mortality rates were higher among American Indian/Alaska Natives and Black/African Americans compared to Whites. Asians and Hispanics experienced lower age-adjusted mortality rates than Whites (Figure 3).





Source: Office of Health Informatics, Division of Public Health, Wisconsin Department of Health Services.

Table 1 shows the total number of deaths and mortality rates by age group, gender, race/ethnicity, and Department of Health Services region. The table demonstrates the effect of age on mortality. As expected, people over the age of 65 experienced a higher mortality rate than younger people and working-age adults. Although 51 percent of 2015 deaths were among females, the age-adjusted mortality rates show that males tended to die younger than females. Comparing mortality rates by race/ethnicity demonstrates that American Indians and Black/African Americans tended to die younger compared to the White population.

There is no statistical difference in age-adjusted mortality rates between the regions of the state.

### Table 1. Total number of deaths and age-adjusted rates per 100,000 by demographic characteristics, 2015, Wisconsin

Demographics	Total Deaths	Percent of Deaths	Crude Death Rate per 100,000 population	Age-adjusted rate per 100,000 population
Age				
Less than 5	447	0.9	131.2	N/A
5 to 17	159	0.3	16.6	N/A
18 to 25	483	0.9	76.7	N/A
26 to 64	10,530	20.5	357.8	N/A
65 and older	39,632	77.3	4,532.5	N/A
Sex				
Female	25,557	49.9	883.3	614.4
Male	25,693	50.1	900.0	826.7
Race/Ethnicity				
White	47,211	92.1	989.3	696.6
Black/African American	2,489	4.9	638.0	960.3
American Indian	404	0.8	722.6	1,028.5
Asian	388	0.8	244.7	416.9
Hispanic	722	1.4	194.3	467.3
DHS Region				
Northeastern	11,576	22.6	89.3	93.5
Northern	5,164	10.1	100.5	105.7
Southeastern	18,089	35.3	85.4	85.5
Southern	9,310	18.2	82.2	83.1
Western	7,095	13.8	87.4	90.5

Source: Office of Health Informatics, Division of Public Health, Wisconsin Department of Health Services.

Notes: Subtotals do not equal the total dumber of deaths because of missing values.

NA indicates "Not Applicable."

Table 2 shows the 10 leading causes of death in Wisconsin by age group in 2015. Overall, heart disease and cancer (malignant neoplasm) were the leading causes of death. In 2015, heart disease deaths surpassed cancer deaths by 47 cases. Unintentional injury has been the third leading cause of death for the past two years. These three leading causes accounted for a little over 50 percent of all deaths. Chronic lower respiratory diseases and stroke were the fourth and fifth leading causes, respectively; each cause accounted for 11 percent of all Wisconsin deaths.

Leading cause of death varies by age group. For infants (<1 year of age), low birth weight was the leading cause of death. Among people aged 1-44, unintentional injury was the leading cause, while cancer was the leading cause for those aged 45-64. Heart disease was the leading cause of death for those aged 65 and older.

Several counties have relatively high age-adjusted mortality rates. Even adjusting for an aging population, mortality rates are higher in Milwaukee, Kenosha, and Chippewa counties (Map 1).

## Table 2. Leading causes of death by age groups, 2015, Wisconsin

	Infants under 1	1 to 4	5 to 14	15 to 24	25 to 34	35 to 44	45 to 54	55 to 64	65 and older	All ages
1	Short Gestation/Low Birth Weight (81)	Unintentional Injury ↑ (16)	Unintentional Injury (26)	Unintentional Injury ↓ (183)	Unintentional Injury ↑ (335)	Unintentional Injury (260)	Cancer (743)	Cancer (2,105)	Heart Disease (9,540)	Heart Disease (11,471)
2	Congenital Malformations ↑ (77)	Congenital Malformations (6)	Cancer (11)	Suicide (116)	Suicide (136)	Cancer (166)	Heart Disease (525)	Heart Disease (1,180)	Cancer (8,309)	Cancer (11,424)
3	Placenta/Cord/ Membrane (19)	Homicide (6)	Homicide (8)	Homicide (61)	Homicide (70)	Heart Disease (161) ↑	Unintentional Injury ↑ (373)	Unintentional Injury (362)	Chronic Lower Respiratory (2,482)	Unintentional Injury (3,186)
4	Pregnancy- Related (16)	Cancer (<5)	Congenital Malformations (6)	Cancer (26)	Cancer (60)	Suicide (133)	Suicide (186)	Chronic Lower Respiratory (285)	Cerebro-Vascular (2,325)	Chronic Lower Respiratory (2,841)
5	Unintentional Injury (15)	Pneumonia/ Influenza (<5)	Suicide (<5)	Heart Disease (12)	Heart Disease (42)	Chronic Liver Disease (44)	Chronic Liver Disease (155)	Chronic Liver Disease ↓ (247)	Alzheimer's (2,066) ↑	Cerebro-Vascular (2,616)
6	SIDS (12)	Heart Disease (<5)	Chronic Lower Respiratory (<5)	Congenital Malformations ↑ (10)	Chronic Liver Disease (12)	Homicide (42)	Diabetes (85)	Diabetes (216)	Unintentional Injury ↑ (1,616)	Alzheimer's (2,085)
7	Bacterial Sepsis (10)	Cerebro-Vascular (<5)	In Situ Neoplasms (<5)	Chronic Liver Disease (<5)	Diabetes (11)	Diabetes (37)	Cerebro-Vascular (61)	Cerebro- Vascular ↑ (191)	Diabetes (1,030)	Diabetes (1,382)
8	Necrotizing Enterocolitis (10)	Pneumonitis/Asp. (<5)	Cerebro-Vascular (<5)	Diabetes (<5)	Congenital Malformations (11)	Cerebro-Vascular (26)	Chronic Lower Respiratory (60)	Suicide (167) ↑	Pneumonia/ Influenza (945)	Pneumonia/ Influenza (1,051)
9	Circulatory (9)	Chronic Liver Disease (<5)	Perinatal (<5)	Cerebro-Vascular (<5)	Cerebro-Vascular (6)	Septicemia (8)	Pneumonia/ Influenza ↓ (28)	Nephritis (73)	Nephritis (886)	Nephritis (995)
10	Respiratory Distress (7)	Perinatal (<5)	Septicemia (<5)	Pregnancy- Related (<5)	Pneumonia/ Influenza (6)	Aneurysm Aorta (8)	Nephritis (23)	Septicemia (56)	Parkinson's (587)	Suicide (874)

Source: Office of Health Informatics, Division of Public Health, Wisconsin Department of Health Services.

Notes:  $[\downarrow]$  = at least a 10% decrease in numbers,  $[\uparrow]$  = at least a 10% increase in numbers, <5=1 to 5

### Map 1. Age-adjusted mortality for all causes of death by county, 2015, Wisconsin



Source: Office of Health Informatics, Division of Public Health, Wisconsin Department of Health Services. Note: Number of deaths are shown in parentheses. Rate is per 10,000 population.

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

### Heart Disease

Heart disease represents disease of the different anatomical parts that constitute the heart, endocardium (the 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 of 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, which are well-defined or ill-defined, and 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).

The following sections describe demographics and trends over time of the three leading causes of death in Wisconsin. Figure 4 shows the total number of deaths over time, while figures 6 and 7 show the overall age-adjusted and the sex-specific mortality rates over time, respectively. In 2015, heart disease represented 23 percent, cancer 22 percent, and unintentional injury 6 percent of all deaths (Figure 5).



#### Figure 4. Total number of deaths by the three leading causes of death, 2005-2015, Wisconsin

Source: Office of Health Informatics, Division of Public Health, Wisconsin Department of Health Services.



#### Figure 5. Distribution of the major leadings causes of death, 2005-2015, Wisconsin

Source: Office of Health Informatics, Division of Public Health, Wisconsin Department of Health Services.

Since 2005, the age-adjusted mortality rates of heart disease and cancer were similar over time. However, the decrease in age-adjusted mortality rates from 2005 to 2015 was much higher for heart disease (14%) compared to cancer (10%). While the age-adjusted mortality rates for cancer and heart disease were decreasing, unintentional injury mortality rates increased 19 percent from 41.3 per 100,000 in 2005 to 49.2 per 100,000 in 2015 (Figure 6).



Figure 6. Age-adjusted rates and percent change of the three leading causes of death, 2005-2015, Wisconsin

Adjusting for age, males had nearly twice as high of a risk of dying from cancer, heart disease, and unintentional injuries than females. Cancer and heart disease age-adjusted mortality rates were similar among males, but not among females. Females experienced a higher age-adjusted mortality rate for cancer than heart disease (Figure 7). In addition, the annual percent decrease in heart disease age-adjusted mortality rates was much steeper than cancer for females.



Figure 7. Total number of deaths by sex, 2005-2015, Wisconsin

In 2015, heart disease was the leading cause of death overall, and particularly so among the population age 65 and older. The Wisconsin age-adjusted heart disease mortality trend decreased at a slower rate than the national rate. In 2005, adjusting for the difference in age distribution, the risk for heart disease mortality was 18 percent lower in Wisconsin compared to the U.S. In 2014, the last year for which U.S. data were available, Wisconsin's age-adjusted heart disease mortality rate (153 per 100,000) was still below the U.S. rate of 167 per 100,000, but the difference narrowed to 8 percent (Figure 8).





Source: Office of Health Informatics, Division of Public Health, Wisconsin Department of Health Services. Note: U.S. rates for 2015 were not available. Table 3 shows the total number and percent distribution of heart disease deaths by types of heart disease and sex, and figure 9 shows the trends for the total number of heart disease deaths separately for males and females.

# Table 3. Total number of heart disease deaths and age-adjusted rates per 100,000 by demographic characteristics,2015, Wisconsin

Demographics	Total Deaths	Percent ofCrude Death Rate perDeaths100,000 population		Age-adjusted rate per 100,000 population
Age				
Less than 5	10	0.1	2.9	NA
5 to 17	(<5)	—	—	NA
18 to 25	12	0.1	1.9	NA
26 to 64	1,906	16.6	64.8	NA
65 and older	9,540	83.2	1,091.0	NA
Sex				
Female	5,410	47.2	187.0	123.0
Male	6,061	52.8	212.3	202.5
Race/Ethnicity				
White	10,369	93.3	217.3	151.2
Black/African American	502	4.5	128.7	210.4
American Indian	75	0.7	134.1	181.1
Asian	65	0.6	41.0	97.7
Hispanic	99	0.9	26.6	80.2
DHS Region				
Northeastern	2,671	23.3	215.6	161.5
Northern	1,107	9.7	226.6	150.5
Southeastern	4,118	35.9	194.5	164.4
Southern	1,991	17.4	177.8	147.1
Western	1,579	13.8	201.4	158.1

Source: Office of Health Informatics, Division of Public Health, Wisconsin Department of Health Services.

Notes: Subtotals do not equal the total dumber of deaths because of missing values.

NA indicates "Not Applicable."

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 48 percent of all heart disease deaths for females, while it represented 63 percent of all heart disease deaths for males. All other forms of heart diseases (e.g., pericarditis and other cardiomyopathies) represented 28 percent of all heart disease deaths in males and 38 percent in females (Table 4).

Table 4. Total number of heart disease deaths and percent distribution by heart disease type and sex, 2015,Wisconsin

Heart disease types	М	ale	Fer	Total Number of	
	Ν	%	N	%	
Ischemic heart	3,807	62.8	2,608	48.2	6,415
Hypertensive heart/renal	329	5.4	393	7.3	722
Pulmonary heart	173	2.9	245	4.5	418
Rheumatic heart	30	0.5	71	1.3	101
Other types	1,722	28.4	2,093	38.7	3,815
Total	6,061	100.0	5,410	100.0	11,471

Source: Office of Health Informatics, Division of Public Health, Wisconsin Department of Health Services.

From 2005 to 2015, the total number of ischemic heart disease deaths declined much more slowly for males than females. The total number declined 7 percent among males—from 4,116 in 2005 to 3,807 in 2015; and 23 percent among females—from 3,763 to 2,608 in the same timeframe (Figure 9).









Source: Office of Health Informatics, Division of Public Health, Wisconsin Department of Health Services. Note: Number of deaths are shown in parentheses. Rate is per 10,000 population. There were 11,424 cancer deaths in Wisconsin in 2015, compared to 10,912 in 2005. However, age-adjusted cancer mortality rates declined during this period, going from 180.4 in 2005 to 162.3 in 2015. The rate was stable from 2010 to 2011, but once again declined in subsequent years, going from 174.3 in 2011 to 162.3 per 100,000 in 2015 (Figure 10).



Figure 10. Total number of cancer deaths and age-adjusted rates, 2005-2015, Wisconsin

Source: Office of Health Informatics, Division of Public Health, Wisconsin Department of Health Services. Note: U.S. rates for 2015 were not available.

The demographic distribution of cancer deaths demonstrates the important effect of age (Table 5). Cancer death rates were highest among the 65 and older age group, which constituted 73 percent of all cancer deaths. The population 65 years and older had 10 times the rate of cancer deaths compared to the 25 to 64 age groups.

Compared to females, males experienced a higher cancer death rate. The crude rate ratio of male and female cancer mortality showed a 16 percent higher rate in males, and the age-adjusted cancer mortality rate ratio was 43 percent higher for males. Therefore, males are more likely to die from cancer than females and at a younger age.

Black/African Americans and American Indians had the highest age-adjusted cancer death rates, followed by Whites. There were no differences in age-adjusted cancer death rates by DHS regions.

# Table 5. Total number of cancer deaths and age-adjusted rates per 100,000 by demographic characteristics,2015, Wisconsin

Demographics	Total Deaths	Percent ofCrude Death Rate perDeaths100,000 population		Age-adjusted rate per 100,000 population
Age				
Less than 5	<5	—	_	NA
5 to 17	16	0.1	1.7	NA
18 to 25	26	0.2	4.1	NA
26 to 64	3,069	26.9	104.3	NA
65 and older	8,309	72.7	950.3	NA
Sex				
Female	5,311	46.5	183.6	137.4
Male	6,113	53.5	214.1	196.4
Race/Ethnicity				
White	10,309	92.5	216.0	157.2
Black/African American	529	4.7	135.6	211.3
American Indian	66	0.6	118.0	161.6
Asian	91	0.8	57.4	123.4
Hispanic	155	1.4	41.7	107.4
DHS Region				
Northeastern	2,582	22.6	208.4	162.3
Northern	1,153	10.1	236.0	160.8
Southeastern	3,938	34.5	186.0	161.9
Southern	2,123	18.6	189.5	160.6
Western	1,624	14.2	207.1	165.2

Source: Office of Health Informatics, Division of Public Health, Wisconsin Department of Health Services.

Notes: Subtotals do not equal the total dumber of deaths because of missing values. NA indicates "Not Applicable."

Lung and tracheal cancers, which represented 25 percent of all cancer deaths, were the leading cause of cancer deaths among males and females. Blood cancers (such as leukemia) were the second leading cause of cancer deaths among males followed by prostate and colon cancers. For females, breast cancer was the second leading cause of death followed by cancers of the genitalia (such as uterine cancer) and blood cancers.

Table 6. Total number of cancer deaths and age-adjusted rates per 100,000 by demographic characteristics
2015, Wisconsin

Cancer Types	Male		Fen	All cancer deaths	
	Ν	%	N	%	
Lung/Trachea	1,570	25.7	1,300	24.5	2,870
Lymphoid and Blood	690	11.3	544	10.2	1,234
Gall Bladder/Pancreas	469	7.7	457	8.6	926
Colon/Rectum/Anal	503	8.2	423	8.0	926
Breast	8	0.1	717	13.5	725
Prostate	607	9.9	-	-	607
Female Genitalia	-	-	601	11.3	601
Liver	266	4.4	124	2.3	390
Esophagus	282	4.6	69	1.3	351
Brain and Nervous System	204	3.3	146	2.7	350
Melanoma/Skin	174	2.8	85	1.6	259
Oral Cancers	137	2.2	51	1.0	188
Stomach	112	1.8	63	1.2	175
Small Intestine	14	0.2	15	0.3	29
Other Types	1,077	17.6	716	13.5	1,793
Total	6,113	100.0	5,311	100.0	11,424

Source: Office of Health Informatics, Division of Public Health, Wisconsin Department of Health Services.









Source: Office of Health Informatics, Division of Public Health, Wisconsin Department of Health Services. Note: Number of deaths are shown in parentheses. Rate is per 10,000 population. Unintentional injuries are the leading cause of death among people aged 1 to 45 and the third leading cause of death overall. The total number of unintentional injury deaths increased 27 percent from 2010. Wisconsin age-adjusted unintentional injury mortality rates were higher than the U.S. for the past six years (Figure 12).



Figure 12. Total number of unintentional injury deaths and age-adjusted rates, 2005-2015, Wisconsin

Source: Office of Health Informatics, Division of Public Health, Wisconsin Department of Health Services. Note: U.S. rates for 2015 were not available.

Table 7 shows the total number, percent distribution, and mortality rates of unintentional injuries in 2015. The unintentional injury mortality rate was four times higher among the 65 and older population compared to the population 25 to 64 years of age, and six times higher than the population 18 to 25 years of age. The age-adjusted mortality rates were two times higher among males than among females. American Indians had the highest age-adjusted mortality compared to Black/African Americans and Whites. The Southeastern region had the highest unintentional injury age-adjusted mortality rate in Wisconsin.

Table 7. Total number of unintentional injury deaths and age-adjusted rates per 100,000 by demographic
characteristics, 2015, Wisconsin

Demographics	Total Deaths	hs Percent of Crude Death Rate per Deaths 100,000 population		Age-adjusted rate per 100,000 population
Age				
Less than 5	31	1.0	9.1	NA
5 to 17	46	1.4	4.8	NA
18 to 25	191	6.0	30.3	NA
26 to 64	1,302	40.9	44.2	NA
65 and older	1,616	50.7	184.8	NA
Sex				
Female	1,339	42.0	46.3	35.0
Male	1,847	58.0	64.7	63.7
Race/Ethnicity				
White	2,709	88.5	56.8	46.8
Black/African American	202	6.6	51.8	62.0
American Indian	48	1.6	85.8	98.0
Asian	14	0.5	8.8	9.5
Hispanic	88	2.9	23.7	35.3
DHS Region				
Northeastern	624	19.6	50.4	43.8
Northern	263	8.3	53.8	45.4
Southeastern	1,265	39.8	59.8	54.2
Southern	631	19.8	56.3	50.5
Western	398	12.5	50.8	45.9

Source: Office of Health Informatics, Division of Public Health, Wisconsin Department of Health Services.

Notes: Subtotals do not equal the total dumber of deaths because of missing values.

NA indicates "Not Applicable."

The leading causes of unintentional injuries were falls, motor vehicle crashes, poisoning, suffocation, drowning, fire, and firearms. Table 8 shows the total number of unintentional injuries by external causes from 2005 to 2015. Falls were the leading cause of unintentional injury death during the entire period. Beginning in 2011, poisoning surpassed motor vehicle crashes as the second leading cause of unintentional injury death. Figure 13 shows that until 2008, motor vehicle crashes were the leading cause of unintentional injury deaths among males, but were surpassed by falls starting in 2009. Among females, falls were the leading cause of unintentional injury deaths for the past 10 years.

Cause of injury	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Fall	807	902	891	918	954	978	1,026	1,091	1,166	1,211	1,341
Motor Vehicle Crash (MVC)	788	719	730	581	531	567	566	566	547	486	570
Poisoning	395	457	529	481	515	507	580	615	748	752	774
Suffocation	97	84	94	101	94	94	99	103	93	120	103
Drowning	52	49	41	59	49	65	60	61	52	43	60
Fire/Flame	51	48	64	46	44	38	43	53	46	44	47
Firearm	7	5	8	8	1	4	4	2	9	5	8
All others	268	239	236	249	244	243	237	298	266	279	283
Total	2,465	2,503	2,593	2,443	2,432	2,496	2,615	2,789	2,927	2,940	3,186

### Table 8. Total number of unintentional injury deaths, 2005-2015, Wisconsin

Source: Office of Health Informatics, Division of Public Health, Wisconsin Department of Health Services.

From 2009 onwards, unintentional chemical injury (poisoning, not limited to drug overdose) was the second leading cause of unintentional injury deaths among males and females (Figure 13). Poisoning refers to the ingestion, either by mouth, by skin contact, inhalation, or parental injection of any natural or synthetic toxic substance (plant, metal, gaseous, venom, or other chemical byproducts/medicines) that interferes with normal body functions.

### Figure 13. Total number of unintentional injury deaths by external cause of death and sex, 2005-2015, Wisconsin



Nearly 23 percent of unintentional injury deaths were caused by multiple injuries. This refers to the physical location of the injuries that resulted in death. Head and neck injuries represented 22 percent of all unintentional injury deaths, and, stratified by sex, represented the second leading type of unintentional injury deaths for males. Chest injuries represented the second leading type of unintentional females. Drug overdose deaths are included in the Other category (Table 9).

Injury Location	Male		Fen	Total	
	Ν	%	Ν	%	
Other/Foreign/Frostbite	850	46.0	433	32.3	1,283
Multiple injuries	441	23.9	281	21.0	722
Head/Neck	339	18.4	213	15.9	552
Lower extremities	149	8.1	312	23.3	461
Thorax	42	2.3	39	2.9	81
Abdomen/Spine/Pelvis	18	1.0	38	2.8	56
Upper extremities	8	0.4	23	1.7	31
Total	1,847	100.0	1,339	100.0	3,186

### Table 9. Total number of unintentional injury deaths by injury type and sex, 2015, Wisconsin

#### Map 4. Age-adjusted mortality rate for unintentional injury cause of death by county, 2015, Wisconsin



Source: Office of Health Informatics, Division of Public Health, Wisconsin Department of Health Services. Note: Number of deaths are shown in parentheses. Rate is per 10,000 population. Working-age adults, males, American Indians, and Black/African Americans have higher rates of drug overdose deaths than other population groups.

A drug overdose is a poisoning by drugs or medicine taken in an amount that is higher than normally used or prescribed independently of the intent. These drugs are byproducts of natural substance (opiates) or semi-synthetic or synthetics (opioids) used legally or illegally. For example, morphine is a byproduct of opium (opiate), which is harvested from naturally occurring poppy plants, while Oxycodone is semi-synthetic (opioid) for which the chemical structure resembles and acts like morphine.

The drug overdose death epidemic continues in the U.S., fueled by prescription drugs and heroin. The Wisconsin drug overdose mortality rates (age-adjusted to 2,000 U.S. standard population) were not statistically different than the U.S. rates. However, the average percent change of the age-adjusted rates from 2010 to 2014 was much higher for Wisconsin (39%) than the U.S. (20%). Overall, the total numbers of drug overdose deaths in Wisconsin and the age-adjusted rates increased nearly 70 percent from 2005 to 2015 (Figure 14).





The demographic distribution shows that working-age adults experienced a higher burden of drug overdose. The drug overdose mortality rate was five times higher among people ages 26 to 64 compared to the 65 and older age group, and twice as high compared to those in the 18 to 25 year-old age group. Males experienced 60 percent higher age-adjusted rates for drug overdose than females. Black/African Americans and American Indians had a higher age-adjusted mortality rate for drug overdose compared to Whites. The Southeastern region had higher age-adjusted rates than the rest of the state (Table 10).

# Table 10. Total number of drug overdose deaths and age-adjusted rates per 100,000 by demographic characteristics,2015, Wisconsin

Demographics	Total Deaths	Percent of Deaths	Crude Death Rate per 100,000 population	Age-adjusted rate per 100,000 population
Age				
Less than 5	—	—	—	NA
5 to 17	—	—	—	NA
18 to 25	75	8.6	11.9	NA
26 to 64	750	86.0	25.5	NA
65 and older	45	5.2	5.1	NA
Sex				
Female	338	38.8	11.7	11.8
Male	534	61.2	18.7	18.8
Race/Ethnicity				
White	706	81.0	14.8	14.9
Black/African American	100	11.5	25.6	29.2
American Indian	15	1.7	26.8	_
Asian	_	—	—	_
Hispanic	28	3.2	7.5	8.1
DHS Region				
Northeastern	151	17.3	12.2	12.7
Northern	56	6.4	11.5	12.0
Southeastern	425	48.7	20.1	19.9
Southern	172	19.7	15.4	15.3
Western	65	7.5	8.3	8.5

Source: Office of Health Informatics, Division of Public Health, Wisconsin Department of Health Services.

Notes: Subtotals do not equal the total dumber of deaths because of missing values.

NA indicates "Not Applicable."

Opioids (including prescription drugs and heroin) were the leading cause of drug overdose deaths and represented over 70 percent of all overdose deaths (Figure 15). However, the drug type for 39 percent of drug overdose deaths was undetermined on the death certificate (Figure 16).



Figure 15. Total number of drug overdose deaths by type of drug, 2005-2015, Wisconsin

Figure 16. Distribution of drug overdose by drug type, 2015, Wisconsin



Source: Office of Health Informatics, Division of Public Health, Wisconsin Department of Health Services. Note: Unknown drugs category represents drug overdose deaths with ICD10 T50.9 or missing a T. code.

Among males, heroin was the leading cause of drug overdose death, followed by prescription drugs and a combination of drugs. Among females, prescription drugs were the leading cause of drug overdose death followed by a combination of drugs (Table 11).

Drug Type	Male		Fer		
	N	%	N	%	Total
Prescription Opioid only	109	20.4	66	19.5	175
Heroin only	112	21.0	27	8.0	139
Combination of drugs	91	17.0	42	12.4	133
Benzodiazepines only	17	3.2	22	6.5	39
Cocaine only	17	3.2	12	3.6	29
Psychostimulants only	8	1.5	3	0.9	11
Narcotics (unspecified)	7	1.3	4	1.2	11
Unknown	173	32.4	162	47.9	335
Total	534	100.0	338	100.0	872

Table 11. Total number of drug overdos	e deaths by drug type a	nd sex, 2015, Wisconsin
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Source: Office of Health Informatics, Division of Public Health, Wisconsin Department of Health Services.

There is a sharp increase in drug combinations as a cause of drug overdoses. The total numbers are on the rise for both males and females. However, in Wisconsin, the rise of heroin deaths among males is increasing faster than any other drug (Figure 17). About 48 percent of drug overdoses included unknown substances.





The total number of unintentional drug overdose deaths doubled for males from 203 in 2005 to 471 in 2015, and it increased 76 percent among females, from 139 in 2005 to 245 in 2015. Among males, self-inflicted drug overdose deaths (suicide) decreased 24 percent, from 62 in 2005 to 47 in 2015, while among females they increased 54 percent, from 48 in 2005 to 74 in 2015 (Figure 18).





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

Of the 51,251 deaths in 2015, nearly 55 percent were cremated and 40 percent buried, which did not differ from 2014.

Table 14 shows the total number and percent of body disposition by demographics, education, marital status, and region of residence. The proportion of deceased who were cremated was higher among the 18 to 64 age groups. Among males, about 59 percent of decedents were cremated compared to 50 percent among females. Whites had the highest proportion of decedents cremated compared to other race/ethnicity categories. Black/African Americans had the lowest proportion of decedents cremated.

Decedents with an education level higher than high school were more likely to be cremated compared to those with less than high school education. No major differences in burial customs were found by regional residence (Map 5). However, counties in the Western and Northern regions had a higher proportion of decedents cremated (Map 6).

In 2015, there were 3,906 autopsies performed, which was 7.6 percent of all deaths.

Autopsies were performed on 40 percent of children ages 0 to 5, 50 percent of those ages 5 to 17, 55 percent of those ages 26 to 44, 18 percent of those ages 45 to 64, and 2 percent for 65 and older age group. The proportion of autopsies performed was higher among males (10.5%) than among females (4.7%), and higher among Black/African Americans (22.5%), Hispanics (21.6%), and Native Americans (17.2%) than among Asians (8.8%) and Whites (6.4%) (Table 12).

Demographics	No Autopsy	Autopsy	Total	Percent	
Age					
Less than 5	265	179	444	40.3	
5 to 17	79	80	159	50.3	
18 to 25	181	302	483	62.5	
26 to 64	7,902	2,628	10,530	25.0	
65 and older	38,916	717	39,633	1.8	
Sex					
Female	24,347	1,210	25,557	4.7	
Male	22,995	2,696	25,691	10.5	
Race/Ethnicity					
White	42,911	2,916	45,827	6.4	
Black/African American	1,899	552	2,451	22.5	
American Indian	314	65	379	17.2	
Asian	344	33	377	8.8	
Hispanic	566	156	722	21.6	

### Table 12. Total number and percent of autopsies performed by demographic characteristics, 2015, Wisconsin

Autopsies were more likely to be performed in the case of injuries, with 42 percent performed in unintentional injury deaths, 97 percent in assault cases, and 54 percent when self-inflicted. Autopsies were also more likely when deaths were due to poisoning (84.3%), fire (78.2%), drowning (70.9%), firearms (65.5%), or MVCs (54.5%) (Table 13).

Table 13. Total number and percent of autopsies performed by leading causes of death, intent, and causes of injury	ļ,
2015, Wisconsin	

Cause of Death	No Autopsy	Autopsy	Total	Percent					
By leading causes									
Heart disease	10,640	831	11,471	7.2					
Cancer	11,325	99	11,424	0.9					
Unintentional injury	1,808	1,308	3,116	42.0					
By injury intent									
Assault (Homicide)	7	237	244	97.1					
Undetermined	18	46	64	71.9					
Self-inflicted (Suicide)	406	468	874	53.5					
Legal/War	0	5	5	100.0					
By selected causes of injury									
Poisoning	152	819	971	84.3					
Fire/Flame	12	43	55	78.2					
Drowning	23	56	79	70.9					
Firearm	211	401	612	65.5					
Motor Vehicle Crash (MVC)	242	328	570	57.5					
Suffocation	176	160	336	47.6					
Fall	1,264	91	1,355	6.7					
All others	219	176	395	44.6					
Total injury causes	2,299	2,074	4,373	47.4					
Total Deaths	47,343	3,906	51,249	7.6					

### Table 14. Disposition of bodies by demographic characteristics, 2015, Wisconsin

Charactaristic	Burial		Cremation		Dona	Donation		Entombment		Other	
Characteristic	Ν	%	Ν	%	Ν	%	Ν	%	Ν	%	Ν
Age											
Less than 5	206	46.4	231	52.0	0	0.0	0	0.0	7	1.6	444
5 to 17	80	50.3	77	48.4	0	0.0	2	1.3	0	0.0	159
18 to 25	185	38.3	293	60.7	0	0.0	4	0.8	1	0.2	483
25 to 64	2,746	26.1	7,597	72.1	35	0.3	129	1.2	23	0.2	10,530
65 and older	16,644	42.0	20,049	50.6	272	0.7	2,601	6.6	67	0.2	39,633
Sex											
Female	10,868	42.5	12,902	50.5	166	0.7	1,589	6.2	32	0.1	25,557
Male	8,992	35.0	15,345	59.7	141	0.6	1,147	4.5	66	0.3	25,691
Race/Ethnicity		1		1			1				
White	17,116	37.4	25,798	56.3	288	0.6	2617	5.7	8	0.0	45,827
Black	1,510	61.6	860	35.1	5	0.2	76	3.1	0	0.0	2,451
American Indian	207	54.6	167	44.1	0	0.0	4	1.1	1	0.3	379
Asian	229	60.7	143	37.9	2	0.5	3	0.8	0	0.0	377
Hispanic	347	48.1	345	47.8	3	0.4	22	3.1	5	0.7	722
Other	452	30.3	934	62.6	9	0.6	14	0.9	84	5.6	1,493
Education											
High school or less	14,453	41.6	18,047	52.0	147	0.4	2,026	5.8	55	0.2	34,728
College/undergraduate	4,403	32.4	8,445	62.1	115	0.9	597	4.4	34	0.3	13,594
Graduate school	740	31.0	1,499	62.7	42	1.8	100	4.2	9	0.4	2,390
Unknown	265	49.4	256	47.7	3	0.6	13	2.4	0	0.0	537
Marital status											
Single	2,529	38.7	3,838	58.8	18	0.3	132	2.0	15	0.2	6,532
Married	6,541	34.8	11,196	59.5	115	0.6	933	5.0	39	0.2	18,824
Divorced	1,722	24.2	5,179	72.8	64	0.9	133	1.9	12	0.2	7,110
Widowed	9,016	48.4	7,941	42.6	110	0.6	1,538	8.3	32	0.2	18,637
Unknown	52	38.0	85	62.0	0	0.0	0	0.0	0	0.0	137
DHS Region											
Northeastern	4,479	38.7	6,117	52.9	43	0.4	919	7.9	17	0.2	11,575
Northern	1,881	36.4	3,109	60.2	22	0.4	143	2.8	9	0.2	5,164
Southeastern	6,968	38.5	9,523	52.7	146	0.8	1,418	7.8	34	0.2	18,089
Southern	3,905	42.0	5,158	55.4	53	0.6	175	1.9	18	0.2	9,309
Western	2,622	37.0	4,329	61.1	42	0.6	80	1.1	17	0.2	7,090
Unknown	6	27.3	11	50.0	1	4.6	1	4.6	3	13.6	22
Total	19,861	38.8	28,247	55.1	307	0.6	2,736	5.3	98	0.2	51,249

Source: Office of Health Informatics, Division of Public Health, Wisconsin Department of Health Services. Note: (<5) Redacted (less than five)

### Map 5. Percent distribution of burial by county, 2015, Wisconsin





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