

Technical Notes

Annual Wisconsin Death Report, 2018 (P-01170-20)

Reporting Requirements

As specified in Wis. Stat. § 69.03(9), the following is a brief outline of the sequence of events that take place when a death occurs in Wisconsin:

- Within 24 hours after being notified of a death, the filing party (usually a funeral director) must create an electronic death record in the State Vital Records system and select the medical certifier, i.e. the physician, coroner, or medical examiner who is responsible for completing and certifying the medical portion of the death record.
- Within six days after the pronouncement of the death, the medical certifier must complete the medical portion of the death record and electronically certify that portion of the record.
- Within two days after the medical certifier has certified the accuracy of the medical portion, the filing party must approve the death record. It will then be available in the State Vital Records system for the appropriate local vital records office (LVRO), comprised of 72 County Register of Deeds Offices and 2 City Health Offices. The LVRO will review the record, and if the record is completed satisfactorily, accept it for filing with the State Vital Records Office. There should be no more than nine calendar days total from date of death until the LVRO receives the electronic death record from the filing party.
- Within 10 business days of receiving the electronic death record from the filing party, the LVRO must accept the record for filing. After the LVRO accepts the electronic death record, the record is ready for registration by the State Vital Records Office.

Nature and Source of the Data

Data in the 2018 Annual Wisconsin Death Report are based on information from all Wisconsin resident deaths in the 2018 calendar year. In 2013, the death certificate standard format was subject to several changes. The State Vital Records Office started collecting death information electronically, and also changed race and ethnicity classifications, allowing more detail with the inclusion of other races and multiple race designations.

Due to differences in cutoff dates and out-of-state reporting, U.S. rates for 2018 were from provisional data available from the National Center for Health Statistics (NCHS). Provisional rate estimates were not available separated by sex.

Cause-of-Death Classification

Causes of death are coded according to the World Health Organization's (WHO) *International Classification of Diseases—Tenth Revision* (ICD-10). This classification system is the current standard used by the NCHS. ICD-10 not only details disease classification, but also provides definitions, tabulation lists, the format of the death certificate, and the rules for coding cause of death. Data presented on cause-of-death statistics are based solely on the underlying cause of death, which is defined as “the disease or injury which initiated the train of morbid events leading directly to death, or the circumstances of the accident or violence that produced the

fatal injury.” All the cause-of-death groupings used in the 2018 Annual Wisconsin Death Report were recommended for state use by NCHS and WHIO.

The Office of Health Informatics (OHI) uses the guidelines described in annual issues of part 2a of the NCHS Instruction Manual. Table 1 shows the list of ICD-10 codes used for ranking. The ranks are divided between decedents after the age of 1 and before, based on different cause of death codes used for infants. For ease of presentation and use of data, some of the codes used by the NCHS were combined.

Table 1. Leading Causes of Death by ICD-10 Classification, 2018

Leading Causes of Death (Over Age 1) and ICD-10 Classification	Total Number of Deaths
All deaths	53,282
Heart disease (I01,I05-I09,I11,I13,I20-I51)	12,045
Cancers (C00-C97)	11,454
Unintentional injuries (V01-V99,W00-W99,X00-X59,Y85-Y86)	3,752
Chronic lower respiratory diseases (J40-J47)	2,864
Stroke (I60-I69)	2,545
Alzheimer’s disease (G30)	2,452
Diabetes (D10-D14)	1,508
Pneumonia/influenza (J09-J18)	1,069
Kidney inflammation (N00-N07,N17-N19,N25-N27)	923
Suicide (U03,Y870,X60-X84)	912
Chronic liver disease (K70, K73-K77)	886
Parkinson’s disease (G20-G21)	691
Septicemia (A40-A41)	573
High blood pressure (I10,I12,I15)	514
Pulmonary inflammation (J69)	418
In situ cancer (D00-D48)	333
Aneurysm of the aorta (I71)	216
Homicide (Y871,X85-X99,Y00-Y09)	194
Nutritional deficiencies (E40-E64)	152
Congenital diseases (Q00-Q99)	133
Anemia (D50-D64)	107
Atherosclerosis (I70)	105
Enterocolitis due to Clostridium difficile (A04)	100
Gall bladder disease (K80-K82)	89
Ulcer (K25-K28)	76
Hernia (K40-K46)	73
Viral hepatitis (B15-B19)	52
Complication of care (Y40-Y84, Y88)	38
HIV (B20-B24)	30
Pneumoconiosis (J60-J66,J68)	8
Pregnancy-related (O00-O99)	7
Appendicitis (K35-K38)	7
Perinatal disease (P00-P99)	6

All other causes	8,950
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Leading Causes of Death for Infants (Under Age 1) and ICD-10 Classification	Total Number of Deaths
All deaths	393
Acute bronchitis (J20-J21)	3
Congenital malformations (Q00-Q99)	78
Short gestation/low birth weight (P07)	69
Maternal pregnancy complication (P01)	26
Unintentional injuries (V01-X59)	24
Circulatory disease (I00-I99)	13
Placenta/cord/membrane (P02)	13
Respiratory distress (P22)	12
Sudden infant death syndrome (R95)	11
Homicide (U01,X85-X99,Y00-Y09)	10
Bacterial sepsis (P36)	9
Neonatal bleeding (P50-P52,P54)	6
Septicemia (A40-A41)	6
Diarrhea and gastroenteric illnesses (A09)	5
Pneumonia/influenza (J09-J18)	5
Anoxic brain damage (G93)	4
Atelectasis/lung collapse (P28)	4
Emphysema (P25)	4
Malnutrition (P05)	4
Chronic respiratory disease (P27)	3
Hydrops fetalis/oedema (P83)	2
Hematologic disease (P60, P61)	2
Kidney failure (N17-N19,N25,N27)	2
Labor complication (P03)	2
Necrotizing enterocolitis (P77)	2
Birth hypoxia/asphyxia (P20-P21)	1
Blood forming disorders (D50-D84)	1
Chronic bronchitis (J40-J42)	1
Hemolytic disease (P55)	1
In situ cancers (D00-D48)	1
Meningitis (G00,G03)	1
Toxins in placenta/milk (P04)	1
Trauma during birth (P10-P15)	1
Cancers (C00-C97)	0
Congenital pneumonia (P23)	0
Dehydration/low volemia (E87)	0
Hernia/intestinal obstruction (K40-K46,K56)	0
All other causes	66

Population Denominators

The 2018 report uses 2018 population estimates for computing rates. These population estimates are post-census estimates from the U.S. Census Bureau and are based on the 2010 census. All population estimates used for a single data year are based on population estimates of the same reference year. Age-adjusted rates are calculated with the U.S. 2000 reference population. The minor civil division populations (available in Appendix J of the report) are based on estimates from the Wisconsin Department of Administration.¹ Wisconsin population estimates by age group is displayed in Table 2 below.

Table 2. Wisconsin Population Estimates as of July 1, 2018.

Age	Female	Male	Total
Under 1	31,386	33,031	64,417
1 to 4	131,137	137,137	268,274
15 to 24	378,026	391,771	769,797
25 to 34	357,372	375,229	732,601
35 to 44	346,101	354,036	700,137
45 to 54	366,096	367,360	733,456
5 to 14	349,490	366,007	715,497
55 to 64	412,957	403,427	816,384
65 to 74	292,712	276,014	568,726
75 to 84	157,224	126,559	283,783
85 and over	83,476	44,503	127,979
Total	2,905,977	2,875,074	5,781,051

population during a specified time period and the size of the population in which the deaths occurred. The basic formula is:

Rates

Rates are measures of the frequency of death in a defined population during a specified time interval. They are calculated by using the number of events (deaths) divided by the population of interest. They are usually expressed in a base number of population (e.g., per 100,000). See Table 2 for Wisconsin population estimates as of July 1, 2018, used for rate calculation. Regions are also used to calculate rates. Map 1 below shows the DHS region breakdown.

Crude Mortality Rates

The crude mortality rate is the mortality rate from all causes of death for a population during a specified time period. The denominator is the population at the mid-point of the time period. To calculate a simple mortality rate, we need to know the number of deaths in a given

¹ Department of Administration, Wisconsin Minor Civil Division Population Estimates, Wisconsin Demographic Services Center. Available at <http://www.doa.state.wi.us/Divisions/Intergovernmental-Relations/Demographic-Services-Center>.

$$\text{Crude Rate} = \frac{\text{Deaths occurring in a given population during a given time period}}{\text{Total number of people in population at midpoint in that time period}} \times 100,000$$

Age-Adjustment

Consistent with standard methods, all rates calculated were age-adjusted using the 2000 U.S. census population as a reference. Age-adjustment allows for meaningful comparison between years or between groups that have different age distributions.

Race/Ethnicity

Beginning in 2013, race and ethnicity were reported separately. A total of 26 fields were created to classify race in addition to the fields used for identifying Hispanic groups. This new classification made it difficult to calculate age-adjusted mortality rates by race and ethnicity. Therefore, to produce population estimates with race categories comparable with earlier mortality reports, the enumerated population data were bridged back to single-race categories consistent with the classic bridged-race grouping from the U.S. Census.²

Missing Values

In the 2018 Annual Wisconsin Death Report, data with missing values were excluded when percentages were calculated. Table 1 below shows missing values for selected fields of data. Missing data have an impact on percentage calculation.

Table 3. Missing Values, 2018

Data Field	Percent of Missing/Unknown n	Number of Missing Values	Number of Unknown
Decedent's Sex	0.0%	0	0
Decedent's County of Residence	0.0%	0	0
Decedent's Minor Civil Division of Residence	0.0%	1	0
Decedent's Zip Code of Residence	0.0%	10	0
Marital Status	0.4%	0	198
Decedent's Education	1.3%	0	719
Race/Ethnicity	0.0%	0	0
Disposition of Body	0.0%	0	11
Was Autopsy Performed?	0.0%	1	7
Underlying Cause of Death	0.0%	5	0
Contributing Cause of Death 1	1.5%	797	-
Contributing Cause of Death 2	2.5%	1,359	-
Contributing Cause of Death 3	46.9%	25,184	-
Contributing Cause of Death 4	65.2%	34,998	-
Contributing Cause of Death 5	79.1%	42,456	-
Contributing Cause of Death 6	88.2%	47,367	-
Contributing Cause of Death 7	93.8%	50,332	-
Contributing Cause of Death 8	96.7%	51,919	-
Contributing Cause of Death 9	98.32%	52,779	-

² http://www.cdc.gov/nchs/nvss/bridged_race/data_documentation.htm, accessed on November 2016

Contributing Cause of Death 10	99.22%	53,260	-
Contributing Cause of Death 11	99.65%	53,494	-
Contributing Cause of Death 12	99.86%	53,603	-
Contributing Cause of Death 13	99.95%	53,652	-
Contributing Cause of Death 14	99.99%	53,673	-

Map 1. DHS Regions by County.

