Technical Notes
Annual Wisconsin Death Report, 2016
(P-01170-18)

Reporting Requirements

As specified in Wis. Stat. ch. 69, 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 a physician, coroner, or medical examiner who is responsible for completing and certifying the medical portion of the death record.
- The medical certifier has six days after pronouncement of the death to complete the medical portion of the record and electronically authenticate 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 Register of Deeds. The Register of Deeds will review the record, and if the record is completed satisfactorily, approve 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 Register of Deeds is notified of the death.
- There should be no more than 10 business days (not including weekends) from the time the Register of Deeds has received the record from the filing party to the time the Register of Deeds approves it. After the Register of Deeds has signed the electronic death record, the death record is ready for registration by the State Vital Records Office.

Nature and Source of the Data

Data in the 2016 Annual Wisconsin Death Report are based on information from all Wisconsin resident deaths in the 2016 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 2016 were from provisional data available from the National Center for Health Statistics. 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 *International Classification of Diseases—Tenth Revision* (ICD-10). This classification system is the current standard used by the National Center for Health Statistics (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 2016 Annual Wisconsin Death Report were recommended for state use by the National Center for Health Statistics and the World Health Organization.

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. For ease of presentation and use of data, some of the codes used by the NCHS were combined.

Population Denominators

The 2016 report uses 2015 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 except for 2016, which was not available at the time this report was drafted. The minor civil division populations are based on estimates from the Wisconsin Department of Administration.[1]

Rates

Rates are measures of the frequency of occurrence 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 1,000). See Appendix Table 3 for Wisconsin population estimates as of July 1, 2015, used for rate calculation.

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

$$Crude\ Rate = \frac{Deaths\ occurring\ in\ a\ given\ population\ during\ a\ given\ time\ period}{Total\ number\ of\ people\ in\ population\ at\ midpoint\ in\ that\ time\ period} x100{,}000$$

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 2016 Annual Wisconsin Death Report, data with missing values were excluded when percentages were calculated. Table 4 in the Appendix shows missing values for selected fields of data. Missing data have an impact on percentage calculation.

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[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 , accessed on November 2016.

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

Appendix—Tables and Map

Table 1. Leading Causes of Death by ICD-10 Classification, 2016

Leading Causes of Death (Over Age 1) and ICD-10 Classification	Total Number of Deaths
All deaths	51,366
Cancers (C00-C97)	11,495
Heart disease (I01,I05-I09,I11,I13,I20-I51)	11,486
Unintentional injuries (V01-V99,W00-W99,X00-X59,Y85-Y86)	3,485
Chronic lower respiratory diseases (J40-J47)	2,783
Stroke (I60-I69)	2,467
Alzheimer's disease (G30)	2,256
Diabetes (D10-D14)	1,440
Kidney inflammation (N00-N07,N17-N19,N25-N27)	956
Pneumonia/influenza (J09-J18)	885
Suicide (U03,Y870,X60-X84)	862
Chronic liver disease (K70, K73-K77)	693
Parkinson's disease (G20-G21)	625
Septicemia (A40-A41)	559
High blood pressure (I10,I12,I15)	493
Pulmonary inflammation (J69)	433
In situ cancer (D00-D48)	305
Homicide (Y871,X85-X99,Y00-Y09)	247
Aneurysm of the aorta (I71)	239
Congenital diseases (Q00-Q99)	132
Atherosclerosis (I70)	126
Nutritional deficiencies (E40-E64)	118
Anemia (D50-D64)	116
Gall bladder disease (K80-K82)	76
Ulcer (K25-K28)	68
Hernia (K40-K46)	60
Viral hepatitis (B15-B19)	54
Complication of care (Y40-Y84, Y88)	40
HIV (B20-B24)	30
Pregnancy-related (O00-O99)	15
Pneumoconiosis (J60-J66,J68)	13
Meningitis (A87,G00-G03)	12
Infections of kidney (N15.9,N16.0)	12
Appendicitis (K35-K38)	10
Hyperplasia of prostate (N40)	10
Legal Intervention (Y35)	8
Tuberculosis (A15-19)	6
Perinatal disease (P00-P99)	5
All other causes	8,746

(Table 1 continued)

Leading Causes of Death for Infants (Under Age 1) and ICD-10 Classification	Total Number of Deaths
All deaths	422
Congenital malformations (Q00-Q99)	99
Short gestation/low birth weight (P07)	80
Maternal pregnancy complication (P01)	19
Unintentional injuries (V01-X59)	17
Bacterial sepsis (P36)	13
Placenta/cord/membrane (P02)	12
Sudden infant death syndrome (R95)	11
Neonatal bleeding (P50-P52,P54)	8
Respiratory distress (P22)	6
Circulatory disease (I00-I99)	5
Atelectasis/lung collapse (P28)	5
Diarrhea and gastroenteric illnesses (A09)	5
Chronic respiratory disease (P27)	5
Birth hypoxia/asphyxia (P20-P21)	4
Pulmonary hemorrhage (P26)	4
Necrotizing enterocolitis (P77)	4
Pneumonia/influenza (J09-J18)	3
Homicide (U01,X85-X99,Y00-Y09)	3
Septicemia (A40-A41)	3
Musculo-dystrophia (G12)	3
Emphysema (P25)	2
Meningitis (G00,G03)	2
Hydrops fetalis/oedema (P83)	2
Anoxic brain damage (G93)	2
Kidney failure (N17-N19,N25,N27)	2
Labor complication (P03)	2
Neonatal aspiration (P24)	2
Maternal health effects (P00)	2
Neonatal diabetes (P70)	1
Hemolytic disease (P55-P59)	1
Blood forming disorders (D50-D84)	1
Acute upper respiratory infection (J00-J06)	1
In situ cancers (D00-D48)	1
Congenital pneumonia (P23)	1
Dehydration/low volemia (E87)	1
Omphalitis-infection of umbilicus (P38)	1
Noninfective gastroenteritis (K29,K50-K55)	1
Slow fetal growth/malnutrition (P05)	1
All other causes	87

Appendix Table 2. Drug overdose and Poisoning Cause of Deaths, ICD10 Classification, 2016

Poisoning	Definition	Number
Drug Overdose	Underlying cause of death in (('X40'<=UCOD<='X44') OR ('X60'<= UCOD <='X64') OR (DEATH='X85') OR ('Y10'<= UCOD <='Y14')	1,031
Opium	T40.0	0
Opioids	Any Secondary Causes mentioning T40-.0-T40.4, T40.6	827
Heroin Only	T40.1	149
Prescription Drugs	T40.2-40.4	
Cocaine Only	T40.5	35
Benzodiazepine	T42.4	29
Psychostimulants Only	T43.6	16
Narcotic Unspecified	T40.6	7
Combination of Drugs*	One or more (Prescription drug, Heroin, Cocaine, Benzodiazepine, Psychostimulants, Narcotics unspecified).	428
Narcotics Unspecified	T50.9 (drug unspecified)	394
Missing T-code	or missing T-code	119
Total		1031

*Note: 2016 computation of combination of drugs changed to include "T40.6- Unspecified Narcotics." Therefore, the previous years' numbers in the 2016 report will not match the 2015 death report.

Appendix Table 3. Wisconsin Population Estimates as of July 1, 2015.

Age Group	Female	Male	Total
All Ages	2,901,346	2,865,228	5,766,574
0	32,538	34,264	66,802
1-4	133,287	139,356	272,643
5-9	176,182	184,440	360,622
10-14	179,588	187,924	367,512
15-17	112,463	117,245	229,708
18-19	74,521	77,584	152,105
20-24	200,865	206,203	407,068
25-29	172,780	181,829	354,609
30-34	183,683	187,867	371,550
35-39	172,306	177,785	350,091
40-44	167,886	171,460	339,346
45-49	185,230	187,723	372,953
50-54	213,751	212,159	425,910
55-59	212,781	210,660	423,441
60-64	187,116	183,711	370,827
65-69	151,989	145,795	297,784
70-74	110,509	98,962	209,471
75-79	83,128	69,002	152,130
80-84	65,421	47,436	112,857
85+	85,322	43,823	129,145

Appendix Table 4. Missing Values for Select Data Fields, Wisconsin, 2016

Data Field	Percent of Missing Values 2014	Percent of Missing Values 2015	Percent of Missing Values 2016
Decedent's Sex	0.00%	0.00%	0.00%
County Where Death Occurred	0.05%	0.02%	0.05%
Decedent's County of Residence	0.05%	0.01%	0.02%
Decedent's Minor Civil Division of Residence	0.04%	0.02%	0.00%
Decedent's Zip Code of Residence	0.05%	0.01%	0.02%
Marital Status	0.00%	0.02%	0.00%
Decedent's Education	0.00%	0.00%	0.00%
Disposition of Body	0.00%	0.00%	0.00%
Was Autopsy Performed?	0.00%	0.03%	0.00%
Underlying Cause of Death	0.97%	0.00%	0.00%
Contributing Cause of Death 1	1.16%	0.18%	1.48%
Did Injury Occur at Work?	8.54%	9.22%	10.0%
Contributing Cause of Death 2	72.35%	73.61%	25.91%
Contributing Cause of Death 3	48.12%	50.44%	48.30%
Contributing Cause of Death 4	29.45%	30.89%	67.23%
Contributing Cause of Death 5	16.22%	17.53%	80.78%
Contributing Cause of Death 6	8.25%	9.16%	89.33%
Contributing Cause of Death 7	4.08%	4.63%	94.31%
Contributing Cause of Death 8	2.01%	2.29%	97.07%
Contributing Cause of Death 9	0.93%	1.12%	98.55%
Contributing Cause of Death 10	0.36%	0.46%	99.34%
Contributing Cause of Death 11	0.16%	0.20%	99.72%
Contributing Cause of Death 12	0.06%	0.08%	99.87%
Contributing Cause of Death 13	0.01%	0.03%	99.94%
Contributing Cause of Death 14	0.00%	0.00%	99.98%

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

Map 1. DHS Regions by County.