

# Technical Notes

## Wisconsin Death Dashboards, 2018-2022

---

### General Details

#### 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. If the record is completed satisfactorily it is accepted 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 Wisconsin Mortality Overview and Leading Causes of Mortality dashboards are based on information from all Wisconsin resident deaths in the 2018-2022 calendar years reported to The State Vital Records Office before the cut-off date (Table 1). In 2013, the death certificate standard format was subject to several changes. The State Vital Records Office started collecting death information electronically. The office also changed race and ethnicity classifications, allowing more detail with the inclusion of other races and multiple race designations.

**Table 1. DHS reporting cut-off dates, by year of death**

Year	Date
2018	7/30/2019
2019	8/21/2020
2020	7/6/2021
2021	11/9/2022
2022	11/7/2023

### **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 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 2 (see appendix) 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.

### **Population**

The population estimates for counties and the state of Wisconsin by age, sex, race, and Hispanic ethnicity for non-census years were provided by the U.S. Census Bureau (see appendix). These estimates were used to calculate population-based health statistics, such as age-adjusted mortality rates. These population estimates are accessible via the Wisconsin Interactive Statistics on Health (WISH) data query system.

## Race and 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. Starting with 2022 data products, the race and ethnicity variable was modified to more closely match population estimates provided by the U.S. Census. The table below shows the categorization based on race and ethnicity information reported on the death certificate.

**Table 3. Race and ethnicity classifications**

Dashboard classification	Race or ethnicity indicated on death certificate
Hispanic	Hispanic ethnicity of any race
Non-Hispanic American Indian	American Indian only
Non-Hispanic Asian*	Laotian, Hmong, Indian, Chinese, Filipino, Japanese, Korean, Vietnamese, or other Asian.
Non-Hispanic Pacific Islander*	Hawaiian, Guam, Samoan, or other Pacific Islander.
Non-Hispanic Black	Black only
Non-Hispanic Multi-race**	See note
Non-Hispanic White	White only
Non-Hispanic Other race***	Other race only

\*Asian and Pacific Islanders were combined in this publication due to small numbers.

\*\* A decedent was classified as Multi-race if there were more than two races identified on their death certificate. For example if Non-Hispanic, White and Black were selected then the decedent would be categorized as Non-Hispanic Multi-race. Similarly, if Non-Hispanic, Chinese and Hawaiian were selected the decedent would be Non-Hispanic Multi-Race. However, if Non-Hispanic, Chinese and Vietnamese were selected, the decedent would be categorized as Non-Hispanic Asian.

\*\*\*In the U.S. census there is no "Other race" to use as a denominator for rate calculations so these counts were excluded from dashboards. See "Missing/ Unknown" section below to get counts of decedents whose death certificated listed "other race" only.

## Age groups

Included mortality statistics are for Wisconsin residents aged 1 or older. Detailed mortality information for infants under 1 year old can be found separately in the infant mortality dashboard.

## Geography

Data was aggregated by residing county to generate mortality counts and rates for the 72 counties in Wisconsin. A map of DHS regions can be found in the appendix.

---

## Calculations

### Crude mortality rate

Crude mortality rates are the simplest rate used to understand mortality in one geographic area. They can be calculated for an entire geographical area, for example the state of Wisconsin, or for subgroups within an area, such as 20-24-year-olds in the state of Wisconsin. The latter would be an example of an age-specific mortality rate.

$$\text{Crude mortality rate} = \left( \frac{\text{Number of deaths in a year}}{\text{Total population at mid-year}} \right) \times 100,000$$

### **Age-adjusted mortality rate**

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. The standard population weights can be found in the appendix (Table 4).

*Age adjusted mortality rate*

$$= \sum (\text{Age specific mortality rate} \times \text{standard population weight})$$

### *Years of potential life lost*

The years of potential life lost (YPLL) calculation estimates the number of life years lost to premature deaths. Similar to life expectancy, YPLL is a good measure of the overall health of an area. Wisconsin uses age 75 as the benchmark for YPLL calculations. A negative number indicates that average age at death exceeded 75 years, while a positive number indicates that the average age at death fell short of 75 years.

*Years of potential life lost (YPLL)*

$$= \text{Benchmark age for population} - \text{Average life expectancy for a population}$$

---

## Appendix

### Population estimates

Source: U.S. Census Bureau (2023). Wisconsin annual county resident population by single year of age, sex, race, and Hispanic ethnicity, Vintage 2022.

### ICD10 Classification

**Table 2. Causes of Death and ICD-10 Classifications, 2018-2022**

CAUSE CODE	CAUSE OF DEATH	ICD-10 CODES
1	Salmonella infections	A01*, A02*
2	Shigellosis and amebiasis	A03*, A06*
3	Tuberculosis	A16*- A19*
4	Whooping cough	A37*
5	Scarlet fever and erysipelas	A38*, A46*
6	Meningococcal infection	A39*
7	Septicemia	A40*, A41*
8	Syphilis	A50*-A53*
9	Acute poliomyelitis	A80*
10	Arthropod-borne viral encephalitis	A83*, A84*
10	Arthropod-borne viral encephalitis	A852*
11	Measles	B05*
12	Viral hepatitis	B15*-B19*
13	HIV	B20*- B24*
14	Malaria	B50*- B54*
15	Malignant neoplasms	C*
16	Benign neoplasms	D0*-D4*
17	Anemias	D60*- D64*
17	Anemias	D5*
18	Diabetes mellitus	E10*- E14*
19	Nutritional deficiencies	E4*, E5*
19	Nutritional deficiencies	E60*- E64*
20	Meningitis	G00*, G03*
21	Parkinson's disease	G20*, G21*
22	Alzheimer's disease	G30*
23	Diseases of heart	I3*, I4*
23	Diseases of heart	I01*, I05*-I09*, I11*, I13*, I20*- I28*, I50*- I52*

**Table 2. Causes of Death and ICD-10 Classifications, 2018-2022 cont.**

CAUSE CODE	CAUSE OF DEATH	ICD-10 CODES
24	Essential (primary) hypertension and hypertensive renal disease	I10*, I12*, I15*
25	Cerebrovascular diseases	I6*
26	Atherosclerosis	I70*
27	Aortic aneurysm and dissection	I71*
28	Influenza and pneumonia	J09*- J18*
29	Acute bronchitis and bronchiolitis	J20*, J21*
30	Chronic lower respiratory diseases	J40*- J47*
31	Pneumoconioses and chemical effects	J60*-J66*, J68*
32	Pneumonitis due to solids and liquids	J69*
33	Peptic ulcer	K25*- K28*
34	Diseases of appendix	K35*- K38*
35	Hernia	K40*- K46*
36	Chronic liver disease and cirrhosis	K70*, K73*, K74*
37	Cholelithiasis and other disorders of gallbladder	K80*- K82*
38	Nephritis, nephrotic syndrome and nephrosis	N00*-N07*, N17*-N19*, N25*- N27*
39	Infections of kidney	N10*, - N12*, N136*, N151*
40	Hyperplasia of prostate	N40*
41	Inflammatory diseases of female pelvic organs	N70*- N76*
42	Pregnancy, childbirth and the puerperium	O*
43	Certain conditions originating in the perinatal period	P*
44	Congenital malformations, deformations and chromosomal abnormalities	Q*
45	Accidents (unintentional injuries)	V*, W*, X0*- X5*, Y85*, Y86*
46	Intentional self-harm (suicide)	U03*, X80*- X84*, X6*, X7*, Y870
47	Assault (homicide)	U01*, U02*, X85*-X89*, X9*, Y0*, Y871
48	Legal intervention	Y35*, Y871
49	Operations of war and their sequelae	Y36**, Y891
50	Complications of medical and surgical care	Y4*-Y7*, Y80*- Y84*, Y88*
51	Enterocolitis C. difficile	A047
52	COVID-19	U071*, U099*

# Wisconsin Department of Health Services regions

Map 1. DHS Regions by County.



## Age adjustment

Table 4. U.S. 2000 standard populations for age adjustment

Age	U.S. standard population (in thousands)	Standard population weight
0 years	3,795	0.013818
1-4 years	15,192	0.055317
5-9 years	19,920	0.075320
10-14 years	20,057	0.073032
15-17 years	11,819	0.043035
18-19 years	8,001	0.029133
20-24 years	18,257	0.066478
25-34 years	37,233	0.135574
35-44 years	44,659	0.162613
45-54 years	37,030	0.134834
55-64 years	23,961	0.087247
65-74 years	18,136	0.066037
75-84 years	12,315	0.044842
85 years and over	4,259	0.015508