

Montana Community Health Insights: Indicator Definitions

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Background

Datasets

The definitions in this document are for use with the:

- Montana Office of Vital Statistics (OVS) birth and death certificate data,
- Montana Hospital Discharge Data (MHDD) emergency department (ED) and inpatient hospitalization data,
- Montana Behavioral Risk Factor Surveillance System (BRFSS) data,
- Montana Tumor Registry data,
- Montana Infectious Disease Information System (MIDIS) case data,
- [Center for Disease Control \(CDC\) PLACES](#),
- [United States Census American Community Surveys \(ACS\)](#).

Citations for each of the datasets are available in the [Index](#) of this document. Please see the [Indicators](#) section below for information on which indicators came from each data source.

Direct access to or data analyses for any of these data sources can be requested by following the links on the [Epidemiology and Scientific Support Bureau webpage](#).

The code for calculating all indicators is available in a Surveillance and Informatics GitLab repository or by request to syndromic@mt.gov.

Rates

For indicators where population-based rates, such as crude rate and age-adjusted rate, are calculated, the population dataset used for the Health Insights dashboard was derived from Census data and is one that the Montana Department of Health and Human Services has available for internal use. When using other population datasets, the calculated rates may vary slightly.

The formulas used for calculating rates are as follows:

Age-Adjusted Rates:

Age-adjusted rates were calculated using the [2000 US standard population](#) and age group distribution #1. The formula for age-adjusted rate calculation is as follows:

$$\text{Age Adjusted Rate} = \Sigma \text{age specific rate}$$

where *age specific rate*

$$= \left(\left(\frac{\text{age specific count of indicator}}{\text{age specific population}} \right) \times 100,000 \right) \times \text{standard proportion}$$

Crude Rates:

Crude rates were calculated using the following formula:

$$\text{Crude Rate} = \left(\frac{\text{Count of indicator}}{\text{Population}} \right) \times 100,000$$

Percents:

For indicators that are presented as a percent, they are calculated by taking the number of events in the population and dividing it by the total number in the population. For example, to calculate the percent of infants with preterm births, the number of preterm births (the event) would be divided by the total number of births (the number in the population). For the statewide value from 2019-2023, that would be 5,336 preterm births divided by 55,342 total births for a value of 9.6% that were preterm.

$$\text{Percent} = \left(\frac{\text{Count of indicator}}{\text{Population}} \right) \times 100$$

Preparing the Datasets

Each of the datasets must be prepared before they can be used to calculate the indicators. The preparation is slightly different for each dataset, and the MHDD and OVS death injury indicators have additional preparation.

Vital Statistics

For indicators in this dashboard the death data was limited to decedents who resided in Montana at the time of their death, DSTR=27 and birth data was limited to births where the mother resided in Montana at the time of birth, BSTR=27. Records with unknown or missing county of residence were included in statewide estimates but not included in any county estimate.

Montana Central Tumor Registry

Cancer cases were limited to Montana residents at the time of diagnosis.

BRFSS

Montana BRFSS data is collected by the University of Wyoming Survey and Analysis Center according to national BRFSS data collection procedures set by CDC. The data are then weighted by CDC to account for the probability of selection and to be representative of the Montana adult population. Detailed information on the weighting methodology for the 2023 data is available [online](#).

PLACES

The PLACES indicators can be extracted from the web interface by searching for specific variables (e.g., CSMOKING for crude prevalence estimate of current smoking) or via the API to extract multiple variables or multiple locations at once.

To use the API, refer to the [instructions](#) provided in the PLACES Data Portal. The County Data 2024 release was used for all PLACES indicators in the Community Health Insights dashboard.

MHDD

For the indicators in this dashboard, the MHDD datasets are limited to records where:

- The individual was a Montana resident
 - STFIPS variable equal to 30
- The record did not have a null age (variable = AGE) value
- The record did not have a null sex (variable = SEX) value

- The record did not have a null county FIPS (variable = PTSTATECNTY) value
- The individual was not seen in a federal facility, such as the VA, or a dedicated mental health facility
 - Exclude FACILITYID value of 30034001
- The record does not have discharge disposition indicating that the individual died while admitted.
 - Exclude DISCHSTATUS values of 20, 40, 41, 42

MHDD Injury Subset

Some indicators also require creating an injury subset from the full MHDD dataset before the indicator can be calculated. To create the injury subset, first ensure that you have prepared the dataset(s) as described immediately above.

Inpatient Injury Subset

For the inpatient injury subset: limit the dataset to records that have an S or T injury diagnosis code in the **primary diagnosis** position. See table and regular expression below.

ICD-10-CM Code*	Description
S00-S99	Anatomic injuries
T07-T34	Foreign bodies, burns, corrosions, frostbite
T36-T50 with an intent character of 1, 2, 3, or 4 Note: Intent information is captured in the 5th character of the following codes: T36.9, T37.9, T39.9, T41.4, T42.7, T43.9, T45.9, T47.9, and T49.9. Intent is captured in 6th character of all other T36-T50 codes.	Poisoning by drugs, medicaments, and biological substances (Includes unintentional, intentional self-harm, assault, and underdetermined intents; Excludes adverse effects and underdosing)
T51-T65	Toxic effects of substances nonmedicinal as to source
T66-T76	Other and unspecified effects of external causes
T79	Certain early complications of trauma, not elsewhere classified
O9A.2-O9A.5	Traumatic injuries and abuse complicating pregnancy, childbirth, and the puerperium
T84.04, M97	Periprosthetic fracture around internal prosthetic joint

*7th character of A, B, C, or missing (reflects initial encounter, active treatment). Exceptions: T30-T32 have 4-5 characters only, O9A.2-O9A.5 have 5- 6 characters only, U07.0 has 4 characters, R45.88 has 5 characters, T07, T14.8, T14.90, T14.91 have 3-5 characters if using data prior to FY2018

Regular expression: (S\d....|(T3[679]9|T414|T427|T4[3579]9)[1-4].|(?!(T3[679]9|T414|T427|T4[3579]9))(T3[6-9]|T4[0-9]|T50)..[1-4]|(T1[5-9]|T2.|T3[34]|T5[1-9]|T6.|T7[0-6]|T79|M97)...|T8404.|O9A[2-5].{1,2}|T3[0-2].{1,2}|T07(...)?|T148(..)?|T149[01](.A?)(A|B|C|\$|\b)

Emergency Department Visit Injury Subset

For the ED injury subset: Include any record that had an injury S & T diagnosis code ([table above](#)) or an external cause of injury code (table below) in **any diagnosis position**.

ICD-10-CM Diagnosis Codes*	Description
V00-V99	Transport accidents
W00-X58	Other external causes of accidental injury
X71-X83	Intentional self-harm
X92-Y09	Assault
Y21-Y33	Event of undetermined intent
Y35-Y38	Legal intervention, operations of war, military operations, and terrorism

*7th character of A or missing (reflects initial encounter, active treatment). Exceptions: Y07 has 4-6 characters only, Y09 has 3 characters only.

Regular expression: ((V|W|X)\d....|(?!(Y0[79]))Y[0-3]....|Y07.{1,3}|Y09)(A|\$|\b)

MIDIS

The MIDIS reportable condition case data is drawn from the annual analytic files developed by the MIDIS team. If you are pulling data the MIDIS web interface reports, your counts and rates will likely deviate from what is published in the dashboard due to cases being added/removed after the analytic files have been locked.

To prepare the analytic files for use, exclude any record with a null value for county or a value for county that is not a Montana county. Additionally, some condition names are cleaned and condensed. For example, "Hepatitis C Virus Infection, chronic", "Hepatitis C Virus Infection, chronic or resolved", "Hepatitis C, chronic", and "Hepatitis C, chronic or resolved" are condensed into "Hepatitis C, chronic".

Census

The Census indicators can be extracted from the web interface by searching for specific variables (e.g., "B18102" to find sex by age by hearing difficulty) or via the API to extract multiple variables at once, or more specific variables (such as "B18102_003", sex by age by hearing difficulty – males under 5 years old).

To use the API, you will need to [request an API key](#). The [tidycensus package](#) in R is helpful for gathering Census ACS data, but the API can be used with SAS, Python, or to

pull data directly into visualization software such as PowerBI. The 5-year estimates were used for the indicators in the Community Health Insights dashboard.

Indicators

The descriptions of each of the indicators are organized by page of the dashboard, then by table in which the indicator appears. For indicators that are repeated across pages, such as asthma or self-harm, the full definition will be given the first time the indicator appears in this manual and subsequent definitions will link to the first appearance of the indicator.

County Summary Page

The dynamic indicators for the county summary paragraphs are in the table below.

Indicator	Data Source
Total county population	Census ACS 5-year estimate for variable B01001_001
Total county area	Montana State Library county area table
Population density	Total county population divided by total county area
American Indian/Alaska Native total population	Census ACS 5-year estimate for variable B02010_001 – AI/AN alone or in combination
Percent of population that is American Indian/Alaska Native	AI/AN population divided by total county population, then multiplied by 100
Average count of births	The mean number of births from the most recent five years. Counts of births for each year are derived from Births by year
Average count of deaths	The mean number of deaths from the most recent five years. Counts of deaths for each year are derived from Deaths by year
Median household income	Census ACS 5-year estimate for variable B19013_001
Percent of residents below the federal poverty level	Census ACS 5-year estimate for variable B17020_001 divided by the total population for the county
Languages spoken in county	Please see the Languages spoken in county section for information on this indicator

Languages spoken in county

Census ACS variables in descending order by the percentage of households who speak each language, with the three most spoken languages are selected. Please see table below for language variables.

Census ACS 5-year estimate variable	Description
B16002_002	English Only
B16002_003	Spanish
B16002_006	French, Haitian, or Cajun
B16002_009	German or West Germanic Languages
B16002_012	Russian, Polish, or other Slavic Languages
B16002_015	Other Indo-European Languages
B16002_018	Korean
B16002_021	Chinese, including Mandarin and Cantonese
B16002_024	Vietnamese
B16002_027	Tagalog, including Filipino
B16002_030	Other Asian and Pacific Island Languages
B16002_033	Arabic
B16002_036	Ethnic Minority Group and Unspecified Languages

Demographics Page

Indicator	Data Source
Total county population	Census ACS 5-year estimate for variable B01001_001
Total county area	Montana State Library county area table
Percent of population under 18 years old	Sum the estimates from the Census ACS 5-year estimates for variables B01001_003:B01001_006 and B01001_027:B01001_030, then divide by total county population and multiply the result by 100
Percent of population 65 years and older	Sum the estimates from the Census ACS 5-year estimates for variables B01001_020:B01001_025 and B01001_044:B01001_049, then divide by total county population and multiply the result by 100
Population pyramid; population by age group and sex	Census ACS 5-year estimates for variables B01001_003:B01001_0049.

Births by year	Total number of live births to mothers residing in the county each year
Deaths by year	Total number of deaths among people residing in the county each year

Population by Race Page

Population by race and year

The Community Insights Dashboard presents detailed race, also known as the alone or in combination approach. The *alone or in combination* approach combines all individuals belonging to a particular racial group (whether alone or in combination with another racial or ethnic group). For example, a respondent who reported being both American Indian/Alaska Native and White would fall into both the “White alone or in combination” category and the “American Indian/Alaska Native alone or in combination” category. Thus, an individual could be counted in more than one category and when added together, these categories may have a sum higher than the total number of people in the county.

Census ACS 5-year estimate variable	Description
B02010_001	American Indian/Alaska Native alone or in combination, total
B02011_001	Asian alone or in combination, total
B02009_001	Black or African American alone or in combination, total
B03002_012	Hispanic or Latinx alone or in combination, total
B02012_001	Native Hawaiian or Pacific Islander alone or in combination, total
B02013_001	Some other race alone or in combination, total
B02008_001	White alone or in combination

Social Determinants of Health Page

Value boxes

Unemployment rate

To find the unemployment rate, the number of people over age 16 in the civilian labor force who are unemployed are divided by the total number of people over 16 in the civilian labor force. Individuals serving in the military and those who are not in the labor force are excluded from this calculation.

Census ACS 5-year estimate variable	Description
B23025_003	Total in civilian labor force, 16 years and older
B23025_005	Unemployed in civilian labor force, 16 years and older

Median household income

The median Census ACS variable B19013_001

Adults with high school diploma or higher

For this variable, each person is counted only one time in the category that represents their highest level of education completed. For example, a person who has a high school diploma and an associate's degree would be counted only in the associate's degree category, not in the high school diploma category. To find the percent of people with a high school diploma, the sum of the estimate from the below variables is then divided by the total number of people 25 years and over, which is variable B15003_001.

Census ACS 5-year estimate variable	Description
B15003_017	Regular high school diploma
B15003_018	GED or alternative credential
B15003_019	Some college, less than 1 year
B15003_020	Some college, 1 or more years, no degree
B15003_021	Associate's degree
B15003_022	Bachelor's degree
B15003_023	Master's degree
B15003_024	Professional school degree
B15003_025	Doctorate degree

Adults who are veterans

Census ACS variable B21001_002 divided by total adults 18+

Household resources table

Household with no vehicle available

Census ACS variable B08201_002 divided by total number of households

Children living in poverty

Census ACS variables B17020_003:B17020_005 divided by population under 18

Percent of residents below the federal poverty level

Census ACS variable B17020_002 divided by total population

Owner-occupied housing units

Census ACS variable B25009_002 divided by total housing units

Households with internet access

Census ACS variable B28002_002 divided by total households

Disability among adults table

Disability status among adults was retrieved from Montana BRFSS data for statewide estimates and PLACES for county level estimates.

Vision disability

Answering “yes” to the question “Are you blind or do you have serious difficulty seeing, even when wearing glasses?” BRFSS variable BLIND; PLACES variable VISION

Self-care disability

Answering “yes” to the question “Do you have difficulty dressing or bathing?” BRFSS variable DIFFDRES; PLACES variable SELFCARE

Mobility disability

Answering “yes” to the question “Do you have serious difficulty walking or climbing stairs?” BRFSS variable DIFFWALK; PLACES variable MOBILITY

Independent living disability

Answering “yes” to the question “Because of a physical, mental, or emotional condition, do you have difficulty doing errands alone such as visiting a doctor’s office or shopping?” BRFSS variable DIFFALON; PLACES variable INDEPLIVE

Hearing disability

Answering “yes” to the question “Some people who are deaf or have serious difficulty hearing use assistive devices to communicate by phone. Are you deaf or do you have serious difficulty hearing?” BRFSS variable DEAF; PLACES variable HEARING

Cognitive disability

Answering “yes” to the question “Because of a physical, mental, or emotional condition, do you have serious difficulty concentrating, remembering, or making decisions?” BRFSS variable DECIDE; PLACES variable COGNITION

Any disability

Answering “yes” to any of the previous 6 questions. BRFSS variable DISABLED2_X; PLACES variable DISABILITY

Access to healthcare among adults table

Access to healthcare measures were retrieved from Montana BRFSS data for statewide estimates and PLACES for county level estimates.

Adults aged 18-64 with no health insurance

Answering “no coverage of any type” to the question “What is the current source of your primary health insurance?” among adults whose reported age is 18 to 64 years. BRFSS CDC calculated variable _HCVU653; PLACES variable ACCESS2

Visited dentist or dental clinic within the past year

Answering “within the past year (anytime less than 12 months ago)” to the question “Including all types of dentists, such as orthodontists, oral surgeons, and all other dental specialists, as well as dental hygienists, how long has it been since you last visited a dentist or a dental clinic for any reason?” BRFSS variable LASTDEN4; PLACES variable DENTAL

Routine checkup within the past year

Answering “within the past year (anytime less than 12 months ago)” to the question “About how long has it been since you last visited a doctor for a routine checkup?” BRFSS variable CHECKUP; PLACES variable CHECKUP

Chronic Conditions Page

Value boxes

Chronic disease risk factor measures were retrieved from Montana BRFSS data for statewide estimates and PLACES for county level estimates.

Obesity prevalence

Body mass index (BMI) of 30 or more calculated from self-reported height, “About how tall are you without shoes?” and weight, “About how much do you weigh without shoes?” BRFSS CDC calculated variable _BMI5CAT; PLACES variable OBESITY

Hypertension prevalence

Answering “yes” to the question “Have you ever been told by a doctor, nurse or other health professional that you have high blood pressure?” BRFSS CDC calculated variable _RFHYPE6; PLACES variable BPHIGH

High cholesterol prevalence

Answering “yes” to the question “Have you ever been told by a doctor, nurse or other health professional that your cholesterol is high?” among adults who reported ever

having their cholesterol checked. BRFSS CDC calculated variable _RFCHOL3; PLACES variable HIGHCHOL

Current cigarette smoking

Answering “yes” to the question “Have you smoked at least 100 cigarettes in your entire life?” AND then answering “everyday” or “some days” to the question “Do you now smoke cigarettes every day, some days, or not at all?” BRFSS CDC calculated variable _RFSMOK3; PLACES variable CSMOKING

No leisure time physical activity prevalence

Answering “no” to the question “During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?” BRFSS CDC calculated variable _TOTINDA; PLACES variable LPA

Chronic Disease Deaths table

Deaths are classified by the National Center of Health Statistics (NCHS) 113 Selected Causes of Death as defined in Table B of the [NCHS Instruction Manual Part 9](#).

Kidney disease

Deaths where the underlying cause of death (DCAUSEC) included ICD-10 codes N000- N079, N170- N199, N250- N279.

Chronic liver disease and cirrhosis

Deaths where the underlying cause of death (DCAUSEC) included ICD-10 codes K700 - K709 or K730 - K749.

Diabetes

Deaths where the underlying cause of death (DCAUSEC) included ICD-10 codes E100 - E149.

Alzheimer’s disease

Deaths where the underlying cause of death (DCAUSEC) included ICD-10 codes G300 - G309.

Stroke

Deaths where the underlying cause of death (DCAUSEC) included ICD-10 codes I600 - I699.

Chronic lower respiratory disease

Deaths where the underlying cause of death (DCAUSEC) included ICD-10 codes J400 - J479.

Heart disease

Deaths where the underlying cause of death (DCAUSEC) included ICD-10 codes I00 – I109, I11, I13, I200 - I519.

Chronic disease hospitalizations table

Heart disease

The indicator for heart disease is adapted from the [CDC Diseases of the Heart Mortality indicator](#) to be compatible with morbidity data. Notably, the morbidity definition excludes I00 Rheumatic fever without heart involvement.

ICD-10-CM	Description
I01-I09	Rheumatic heart diseases
I11	Hypertensive heart disease
I13	Hypertensive heart and chronic kidney disease
I20-I25	Ischemic heart diseases
I26-I28	Pulmonary heart disease
I30-I51	Other forms of heart disease

Regular expression: I0[1-9]||I1[13]||I[2-4][0-9]||I5[01]

Kidney disease

ICD-10 code of N17-19 in any diagnosis position.

ICD-10-CM	Description
N17	Acute kidney failure
N18	Chronic kidney disease
N19	Unspecified kidney disease

regular expression: N1[7-9]

Diabetes

ICD-10 code of E10, E11, E13 in any diagnosis position.

ICD-10-CM	Description
E10	Type 1 diabetes mellitus
E11	Type 2 diabetes mellitus
E13	Other specified diabetes mellitus

Regular expression: E1[013]

Chronic obstructive pulmonary disease

The [Medicare definition for COPD](#) on the CDC Chronic Disease indicators page was adapted to include any inpatient adult older than 65 years. ICD-10-CM code J40-J44 in any diagnosis position; regular expression: J4[0-4]

Asthma

The [CDC asthma emergency department indicator](#) was used. In the Community Health Insights dashboard, confirmed and probable ED visits for asthma are included, which is J45 in any diagnosis position; Regular expression: J45

Chronic liver disease and cirrhosis

All liver disease diagnosis codes were included in this definition, which are ICD-10 codes K70-K77 in any diagnosis position. To limit to [alcoholic liver disease](#), include only K70, K73, and K74.

ICD-10-CM	Description
K70	Alcoholic liver disease
K71	Toxic liver disease
K72	Hepatic failure
K73	Chronic hepatitis
K74	Fibrosis and cirrhosis of liver
K75-K77	Other liver disease

Regular expression: K7[0-7]

Stroke

ICD-10 code of I60-I69 in any position. This includes cerebral hemorrhage, cerebral infarction, occlusion and stenosis of cerebral arteries, and sequelae.

ICD-10-CM	Description
I60-I62	Nontraumatic intracranial hemorrhages
I63	Cerebral infarction
I65-I66	Occlusion and stenosis of arteries, without cerebral infarction
I67-I68	Other cerebrovascular diseases
I69	Sequelae of cerebrovascular disease

Regular expression: I6[0-9]

Cancer:

Cancer incidence measures are derived from Montana Central Tumor Registry data. Cancer type is defined using primary site and histology groupings established by the National Cancer Institute Surveillance, Epidemiology, and End Results Program (SEER). For specific SEER Recode definitions for each site refer to the [Site Recode ICD-O-3/WHO 2008 Definition](#) website. Cancer death measures are grouped according to [SEER Cause of Death Recode](#) for underlying cause of death codes in death data .

All invasive cancers

Incidence: SEER site codes 20010-37000

Mortality: underlying cause of death codes C00 - C979

Prostate cancer

Only men are included in prostate cancer.

Incidence: SEER site code 28010

Mortality: underlying cause of death codes C61- C619

Female breast cancer

Only women were included in breast cancer statistics. While men can have breast cancer, it is much rarer and has different etiology.

Incidence: SEER site code 26000

Mortality: underlying cause of death codes C50- C509

Lung cancer

Incidence: SEER site code 22030

Mortality: underlying cause of death codes C34 - C349

Colorectal cancer

Incidence: SEER site codes 21041-21049, 21051, 21052

Mortality: underlying cause of death codes C18 - C209

Melanoma

Incidence: SEER site code 25010

Mortality: underlying cause of death codes C43 - C439

Liver cancer

Incidence: SEER site codes 21071 and 21072

Mortality: underlying cause of death codes C22 - C229

Child and Adolescent Health Page

Leading causes of death among children and adolescents (aged 0-24 years) table

Deaths were limited to decedents aged 0 to 24 years and classified by the NCHS 113 Selected Causes of Death as defined in Table B of the [NCHS Instruction Manual Part 9](#) with the exception of Motor vehicle crash injury deaths. The NCHS definition includes non-traffic motor vehicle crashes, those that occur outside of public roadways. This

dashboard only included traffic motor vehicle deaths to align with the definition used by the Montana Injury Prevention Program.

All causes of death

All deaths where the decedent was aged 0 to 24 years at the time of death.

All unintentional injury deaths

Deaths where the underlying cause of death (DCAUSEC) included any of the following

ICD-10 Codes	Description
V00-V99	Transport Accidents
W00-X59	Other external causes of accidental injury
Y85	Sequelae of Transport Accidents
Y86	Sequelae of Other Accidents

Suicide

Deaths where the underlying cause of death (DCAUSEC) included any of the following

ICD-10 Codes	Description
X60-X84	Intentional self-harm
Y87.0	Sequelae of intentional self-harm
U03	Terrorism-intentional self-harm

Motor vehicle crash injury deaths

Deaths where the underlying cause of death (DCAUSEC) included any of the following

ICD-10 Codes	Description
V02-V04 (.1, .9), V09.2	Pedestrian injured in transport accident
V12-V14 (.3-.9), V19.4-V19.6	Pedal cyclist injured in transport accident
V20-V28 (.3-.9), V29.4-V29.9	Motorcycle rider injured in transport accident
V30-V39 (.4-.9)	Occupant of three-wheeled motor vehicle injured in transport accident
V40-V49 (.4-.9)	Car occupant injured in transport accident
V50-V59 (.4-.9)	Occupant of pick-up truck or van injured in transport accident
V60-V69 (.4-.9)	Occupant of heavy transport vehicle injured in transport accident
V70-V79 (.4-.9)	Bus occupant injured in transport accident
V80.3-V80.5, V81.1, V82.1, V83-V86 (.0-.3), V87.0-V87.8, V89.2	Other land transport accidents

Non-motor vehicle injury deaths

Deaths where the underlying cause of death (DCAUSEC) was included in unintentional injury but NOT in Motor vehicle crash injury.

ICD-10 Codes	Description
V01 - V019, V05 - V069, V091, V093- V099, V10 - V119, V15 - V189, V193, V198- V199, V800- V802, V806- V809, V812- V819, V822- V829, V879, V889, V891, V893, V899	Non-traffic land transport accident
V90 - V999	Water, air, space, and other or unspecified transport accidents
Y85	Sequelae of Transport Accidents
W00-X59	Other external causes of accidental injury
Y86	Sequelae of Other Accidents

Perinatal conditions

Deaths where the underlying cause of death (DCAUSEC) was included ICD-10 codes P00 - P969.

Birth defects and genetic abnormalities

Deaths where the underlying cause of death (DCAUSEC) was included ICD-10 codes Q00 - Q999.

Homicide

Deaths where the underlying cause of death (DCAUSEC) included any of the following

ICD-10 Codes	Description
X85-Y09	Assault
Y87.1	Sequelae of assault
U01	Terrorism-assault
U02	Sequelae of terrorism-assault

Hospitalizations among children and adolescents (aged 0-24 years) table

All hospitalizations

Any record in MHDD inpatient dataset where patient was younger than 25 years old.

Acute respiratory infection hospitalizations (RSV, Influenza, COVID-19)

The definition for acute respiratory infection hospitalizations for children and adolescents is derived from the [CDC Respiratory Surveillance indicator](#) and limited to patients under 25 years old.

ICD-10-CM Codes	Description
J12.82	Pneumonia due to coronavirus disease 2019
U07.1	COVID-19
J09-J11	Influenza and sequelae
B97.4	Respiratory syncytial virus as the cause of diseases classified elsewhere
J12.1	Respiratory syncytial virus pneumonia
J20.5	Acute bronchitis due to respiratory syncytial virus
J21	Acute bronchiolitis

Regular expressions:

- COVID-19 - "J1282|U071"
- Influenza - "J09|J1[01]"
- RSV - "B974|J121|J205|J21"
- All three respiratory infections – "J1282|U071| J09|J1[01]| B974|J121|J205|J21"

Asthma hospitalizations

Confirmed and probable admissions were included, which is J45 in any diagnosis position AND age younger than 25 years old; Regular expression: J45

Suicide attempt or self-harm hospitalization

First, subset inpatient dataset to injuries by selecting records that have a principal injury diagnosis (see [Injury section](#) above), then select records with a self-harm injury code (table below) and age is younger than 25.

ICD-10-CM Codes	Description
T36-T50 with an intent character of 2 Note: Intent information is captured in the 5th character of the following codes: T36.9, T37.9, T39.9, T41.4, T42.7, T43.9, T45.9, T47.9, and T49.9. Intent is captured in 6th character of all other T36-T50 codes.	Self-harm by poisoning with drugs, medications, and biological substances
T51-T65 with an intent character of 2 Note: Intent information is captured in the 5th character of the following codes: T51.9, T52.9, T53.9, T54.9, T56.9, T57.9, T58.0, T58.1, T58.9, T59.9, T60.9, T61.0, T61.1, T61.9, T62.9, T63.9, T64.0, T64.8, and T65.9. Intent is captured in 6th character of all other T51-T65 codes.	Self-harm by toxic effects of non-medicinal substances
X71-X83	Self-harm
T71 with 6th character of 2	Self-harm by asphyxiation, suffocation, hanging
T14.91	Suicide attempt

R45.88	Non-suicidal self-harm
--------	------------------------

Regular expression:

```
((T3[679]9|T414|T427|T4[3579]9)2.|(?!(T3[679]9|T414|T427|T4[3579]9))(T3[6-9]|T4[0-9]|T50)..2|((T5[1-46- 9]|T6[0-35])9|(T58|T61)[01]|T64[08])2.|(?!(T5[1-46-9]|T6[0-35])9|(T58|T61)[01]|T64[08]))(T5[1-9]|T6[0- 5])..2|(X7[1-9]|X8[0-3])...|T71..2|T1491(.A)?|R4588)(A|$\|b)
```

Emergency department visits among children and adolescents (aged 0-24 years) table

All emergency department visits

Any visit in the emergency department dataset by a person younger than 25 years old.

Non-fatal unintentional injury ED visits

Any visit with an injury code (see table and regular expression in [preparing the injury subset](#) section above) in any diagnosis position and age younger than 25.

Asthma ED visits

Confirmed and probable admissions were included, which is J45 in any diagnosis position AND age younger than 25 years old; Regular expression: J45

Suicide attempt or self-harm ED visits

First subset to [visits with an injury code](#) in any position, then subset to visits with a self-harm code in any position ([see table and regular expression above](#)) and age younger than 25.

Youth disabilities table

Cognition difficulty (5-17 years)

Census ACS 5-year estimate variable	Description
B18104_004	Total, male, 5-17 years, with a cognitive difficulty
B18104_020	Total, female, 5-17 years, with a cognitive difficulty

Vision difficulty (0-17 years)

Census ACS 5-year estimate variable	Description
B18103_004	Total, male, under 5 years, with a vision disability
B18103_007	Total, male, 5-17 years, with a vision difficulty
B18103_023	Total, female, under 5 years, with a vision difficulty
B18103_026	Total, female, 5-17 years, with a vision difficulty

Self-care difficulty (5-17 years)

Census ACS 5-year estimate variable	Description
B18106_004	Total, male, 5-17 years, with a self-care difficulty
B18106_020	Total, female, 5-17 years, with a self-care difficulty

Hearing difficulty (0-17 years)

Census ACS 5-year estimate variable	Description
B18102_004	Total, male, under 5 years, with a hearing disability
B18102_007	Total, male, 5 -17 years, with a hearing difficulty
B18102_023	Total, female, under 5 years, with a hearing difficulty
B18102_026	Total, female, 5-17 years, with a hearing difficulty

Ambulatory difficulty (5-17 years)

Census ACS 5-year estimate variable	Description
B18105_007	Total, male, 5 -17 years, with an ambulatory difficulty
B18105_023	Total, female, under 5 years, with an ambulatory difficulty

Maternal and Infant Health Page

Value boxes

Total births

Total number of live births to Montana residents based on birth certificate data.

Infant deaths

Total number of deaths prior to one year of age following a live birth among Montana residents based on death certificate data.

Pregnancy Risk Factors Table

Tobacco use during pregnancy

Births where the mother reported on the birth certificate smoking cigarettes in any of the three trimesters of this pregnancy. Variable BSMOKE = 'Y'

Syphilis infection during pregnancy

Births where the birth attendant or facility reported on the birth certificate a syphilis infection was present and/or treated during this pregnancy. Variable BSYPHILIS03 = 'Y'

Preeclampsia

Births where the birth attendant or facility reported on the birth certificate the mother was diagnosed with a Preeclampsia during this pregnancy. Variable BECLAMPS03 = 'Y'

No prenatal care

Births where the mother reported on the birth certificate not receiving any prenatal care during this pregnancy. Variable BVISITS

Hepatitis B infection during pregnancy

Births where the birth attendant or facility reported on the birth certificate a hepatitis B infection was present and/or treated during this pregnancy. Variable BHEPATITISB03 = 'Y'

Gonorrhea infection during pregnancy

Births where the birth attendant or facility reported on the birth certificate a gonorrhea infection was present and/or treated during this pregnancy. Variable BGONORRHEA03 = 'Y'

Gestational diabetes

Births where the birth attendant or facility reported on the birth certificate the mother was diagnosed with gestational diabetes during this pregnancy. Variable BDIABETG03 = 'Y'

Chlamydia infection during pregnancy

Births where the birth attendant or facility reported on the birth certificate that a chlamydia infection was present and/or treated during this pregnancy. Variable BCHLAMYDIA03 = 'Y'

Alcohol use during pregnancy

Births where the mother reported on the birth certificate consuming any alcohol during this pregnancy. Variable BDRINKA = 'Y'

Fertility Rates Table

Teen fertility rate among AI/AN girls

Births where the mother is 15 to 19 years old at the time of birth and selected American Indian either alone or in combination with another race. Variable BMOMAGES equals 15, 16, 17, 18, or 19 and BMOMRACE3 = 'Y'

Teen fertility rate

Births where the mother is 15 to 19 years old at the time of birth. Variable BMOMAGES equals 15, 16, 17, 18, or 19.

Fertility rate among AI/AN women

Births where the mother selected American Indian either alone or in combination with another race. Variable BMOMRACE3 = 'Y'

Fertility rate

All live births as reported from the birth certificate data.

Infant Health table

5-minute Apgar score <7

Births where the infant's 5-minute Apgar score was less than 7. Variable BAPGAR5 < 7

Infant breastfed at the time of discharge

Births where the infant is reported to be breastfeeding at the time of discharge from the birthing facility. Variable BBREASTFED = 'Y'

Low birth weight births

Births where the infant weighed less than 2500 grams at birth. Variable BWTGRMS < 2500.

Preterm births

Birth where obstetric estimation of gestation was less than 37 weeks. Variable BGESTAT < 37

Injury and Violence Page

Unintentional injury table

All unintentional injury deaths

Deaths where the underlying cause of death (DCAUSEC) included any of the following

ICD-10 Codes	Description
V00-V99	Transport Accidents
W00-X59	Other external causes of accidental injury
Y85	Sequelae of Transport Accidents
Y86	Sequelae of Other Accidents

Fatal workplace injuries

Among deaths where the underlying cause of death was an injury (DCAUSEC = V01-Y36, Y85-Y87, Y89, U01-U03), the injury occurred at work. DINJWORKG = 'Y'.

Motor vehicle crash injury deaths

Deaths where the underlying cause of death (DCAUSEC) included any of the following

ICD-10 Codes	Description
V02-V04 (.1, .9), V09.2	Pedestrian injured in transport accident
V12-V14 (.3-.9), V19.4-V19.6	Pedal cyclist injured in transport accident
V20-V28 (.3-.9), V29.4-V29.9	Motorcycle rider injured in transport accident
V30-V39 (.4-.9)	Occupant of three-wheeled motor vehicle injured in transport accident
V40-V49 (.4-.9)	Car occupant injured in transport accident
V50-V59 (.4-.9)	Occupant of pick-up truck or van injured in transport accident
V60-V69 (.4-.9)	Occupant of heavy transport vehicle injured in transport accident
V70-V79 (.4-.9)	Bus occupant injured in transport accident
V80.3-V80.5, V81.1, V82.1, V83-V86 (.0-.3), V87.0- V87.8, V89.2	Other land transport accidents

Non-fatal motor vehicle crash ED visits

Subset to ED [injury](#) dataset, then apply unintentional motor vehicle injury codes to all diagnosis codes.

ICD-10-CM Code	Description
V02.1, V02.9, V03.1, V03.9, V04.1, V04.9, V09.2, V09.3	MVT Pedestrian
V12-V14 (.3-.9), V19.4-V19.6, V19.9 For 10/1/22 and later, add these codes: V22-V24 (.3-.9), V29.9 with 5th character of 1 V29.4-V29.6 with 6th character of 1	MVT Pedal Cycle
V20-V28 (.3-.9), V29.4-V29.9 For 10/1/22 and later, exclude these codes: V20-V28 (.3-.9), V29.9 with 5th character of 1 V29.4-V29.8 with 6th character of 1	MVT Motorcycle
V30-V79 (.4-.9), V83-V86 (.0-.3), V87.0-V87.8, V89.2	MVT Occupant
V80.3-V80.5, V81.1, V82.1	MVT Other

Regular expression: (?!(V2[0-15-8][3-9]1.V298\d1))((V0[234][19]|V09[23]|V1[2-4][3-9]|V19[4-69]|V2[0-8][3-9]|V29[4-9]|V[3-7].[4-9]|V8[3-6][0-3]|V87[0-8]|V892|V80[3-5]|V8[12]1).)(A|\$\b)

Non-fatal unintentional fall hospitalizations

Subset to [ED injury dataset](#), then any record with a fall diagnosis code in any position:

ICD-10-CM	Description
V00.11-V00.89 with 6th character of 1	Falls related to pedestrian conveyance
W00-W15, W17, W19	Falls
W16.0-W16.3, W16.5-W16.8 with 6th character of 2 W16.4 and W16.9 with 5th character of 2	Fall, jump, or diving into water causing other injury
W18.1, W18.2, W18.3	Other falls

Regular expression: ((?!V000)V00..1|(W0.|W1[0-579])...|W18[123]..|W16[49]2.|(?!W16[49])W16..2)(A|\$\|\\b)

Unintentional fall deaths

Deaths where the underlying cause of death (DCAUSEC) included codes W00-W19.

Suicide/Intentional Self Harm table

Suicide deaths by firearm

Deaths where the underlying cause of death (DCAUSEC) included codes X72–X74.

Suicide deaths

Deaths where the underlying cause of death (DCAUSEC) included any of the following

ICD-10 Codes	Description
X60-X84	Intentional self-harm
Y87.0	Sequelae of intentional self-harm
U03	Terrorism-intentional self-harm

Suicidal ideation and self-harm ED visits

First subset to [visits with an injury](#) code in any position, then subset to visits with a self-harm code in any position ([see table and regular expression above](#)).

Suicidal ideation and self-harm hospitalizations

First subset to [visits with an injury code](#) in the principal diagnosis position, then subset to visits with a self-harm code in any position ([see table and regular expression above](#)).

Homicide/Assault table

Homicide deaths by firearm

Deaths where the underlying cause of death (DCAUSEC) included codes U014 or X93 - X959.

Homicide deaths

Deaths where the underlying cause of death (DCAUSEC) included any of the following

ICD-10 Codes	Description
X85-Y09	Assault
Y87.1	Sequelae of assault
U01	Terrorism-assault
U02	Sequelae of terrorism-assault

Assault ED visits

First subset to [visits with an injury code](#) in any position, then subset to visits with an assault code in any position (see table and regular expression below).

ICD-10-CM	Description
T36-T50 with an intent character of 3 Note: Intent information is captured in the 5th character of the following codes: T36.9, T37.9, T39.9, T41.4, T42.7, T43.9, T45.9, T47.9, and T49.9. Intent is captured in 6th character of all other T36-T50 codes.	Assault by poisoning with drugs, medications, and biological substances
T51-T65 with an intent character of 3 Note: Intent information is captured in the 5th character of the following codes: T51.9, T52.9, T53.9, T54.9, T56.9, T57.9, T58.0, T58.1, T58.9, T59.9, T60.9, T61.0, T61.1, T61.9, T62.9, T63.9, T64.0, T64.8, and T65.9. Intent is captured in 6th character of all other T51-T65 codes.	Assault by toxic effects of non-medicinal substances
X92-Y09	Assault by various mechanisms
T71, with 6 th character of 3	Assault by asphyxiation, suffocation, or hanging
T74, T76	Confirmed/suspected adult or child abuse, neglect, or other maltreatment
Y38	Terrorism

Regular expression:

```
((T3[679]9|T414|T427|T4[3579]9)3.|(?!T3[679]9|T414|T427|T4[3579]9))(T3[6-9]|T4[0-9]|T50)..3|((T5[1-46-9]|T6[0-35]9|(T58|T61)[01]|T64[08])3.|(?!((T5[1-46-9]|T6[0-35]9|(T58|T61)[01]|T64[08]))(T5[1-9]|T6[0-5])..3|T71..3|(X9[2-9]|Y0[0-68]|T7[46]|Y38)...|Y07.{1,3}|Y09)(A|$|\b)
```

Assault hospitalizations

First subset to [visits with an injury diagnosis code](#) in principal diagnosis, then subset to [visits with an assault diagnosis code](#) in any position.

Behavioral Health and Substance Use Page

Value boxes

Behavioral Health measures were retrieved from Montana BRFSS data for statewide estimates and PLACES for county level estimates.

Ever diagnosed with depression

Answering “yes” to the question “Has a doctor, nurse, or other health professional ever told you that you had a depressive disorder (including depression, major depression, dysthymia, or minor depression)?” BRFSS Variable ADDEPEV3; PLACES Variable DEPRESSION

Frequent mental distress

Answering 14 or more days to the question “Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?” CDC calculated BRFSS variable _MENT14D; PLACES Variable MHLTH

Binge drinking among adults

Answering one or more times to the question “Considering all types of alcoholic beverages, how many times during the past 30 days did you have X [CATI X = 5 for men, X = 4 for women] or more drinks on an occasion?” CDC calculated BRFSS variable _RFBING6; PLACES Variable BINGE

Anxiety and Depression table

Hospitalizations due to depressive disorder

Do not restrict to the injury dataset. This definition was adapted from the depressive disorders ESSENCE chief complaint and discharge diagnosis definition. Chief complaint terms were removed.

ICD-10-CM	Description
F32 except F32.5	Depressive episode
F33 except F33.42	Recurrent major depressive disorder
F34.1 and F34.9	Dysthymic disorder and unspecified mood disorder
F43.21 and F43.213	Adjustment disorder with depressed mood component
O90.6	Postpartum mood disturbance

Regular expression: F3[23]||A012389||F334[01]||F324|F34[19]||F432[13]||O906

Hospitalizations due to anxiety

Do not restrict to the injury subset.

ICD-10-CM	Description
F06.4	Anxiety disorder due to known physiological condition
F40-F41	Anxiety disorders
F93.0	Separation anxiety disorder of childhood
F94.0, F94.8, F94.9	Selective mutism and childhood disorders of social functioning
R46.6	Undue concern and preoccupation with stressful events
R45.0, R45.1	Nervousness and restlessness and agitation
R45.82	Worries

Regular expression: (^F064|^F4[01]]|^F930|^F94[089]]|^R466|^R45[01]]|^R4582)

Alcohol Use table

Alcohol-induced deaths

Deaths where the underlying cause of death (DCAUSEC) is included as 100% alcohol-attributable by the Center for Disease Control and Prevention [Alcohol-Related Disease Impact](#).

ICD-10 Codes	Description
F103 - F109	Alcoholic psychosis
F100, F101	Alcohol abuse
F102	Alcohol dependence syndrome
G621	Alcohol polyneuropathy
G312	Degeneration of nervous system due to alcohol
G721	Alcoholic myopathy
I426	Alcohol cardiomyopathy
K292	Alcoholic gastritis
K700 - K704, K709	Alcoholic liver disease
K852	Alcohol-induced acute pancreatitis
K860	Alcohol-induced chronic pancreatitis
Q860	Fetal alcohol syndrome
P043	Fetus and newborn affected by maternal use of alcohol
X45 - X459, Y15 - Y159	Alcohol poisoning
X65 - X659	Suicide by and exposure to alcohol

Alcohol-use related hospitalizations

Any record from the inpatient dataset with a code in the following table in any position. Do not restrict to the injury subset.

ICD-10-CM	Description
F10	Alcohol related disorders
G62.1	Alcohol polyneuropathy
G31.2	Degeneration of nervous system due to alcohol
G72.1	Alcoholic myopathy
I42.6	Alcohol cardiomyopathy
K29.2	Alcoholic gastritis
K70	Alcoholic liver disease
K85.2	Alcohol-induced acute pancreatitis
K86.0	Alcohol-induced chronic pancreatitis
Q86.0	Fetal alcohol syndrome
P04.3	Fetus and newborn affected by maternal use of alcohol
O35.4	Maternal care for (suspected) damage to fetus from alcohol
O99.31	Alcohol use complicating pregnancy, childbirth, and the puerperium
T51.0	Toxic effect of ethanol

Regular expression:

`^F10|^G621|^G312|^G721|^I426|^K292|^K70|^K852|^K860|^Q860|^P043|^O354|^O9931|^T510`

ED encounters for alcohol use

Any code from the emergency department dataset with an [alcohol-related diagnosis code](#) in any position. Do not restrict to the injury subset.

Other substance use table

Drug overdose deaths

Deaths where the underlying cause of death (DCAUSEC) included in the following

ICD-10 Codes	Description
X40–X44	Accidental Poisoning by drugs, medicaments, and biological substances
X60-X64	Intentional self-poisoning by drugs, medicaments, and biological substances
X85	Assault by drugs, medicaments, and biological substances

Y10-14	Poisoning by and exposure to drugs, medicaments, and biological substances, undetermined intent
--------	-------------------------------------------------------------------------------------------------

ED encounter for opioid overdose

Any record from the emergency department dataset with an opioid ICD-10-CM code in any diagnosis field. Do not restrict to the injury dataset.

ICD-10-CM	Description
T40.0	Poisoning by opium
T40.1	Poisoning by heroin
T40.2	Poisoning by other opioids
T40.3	Poisoning by methadone
T40.4	Poisoning by synthetic narcotics
T40.60, T40.69	Poisoning by other/unspecified narcotics

Regular expression: ((T40[0-4].|T406[09])[1-4])(A|\$\|b)

ED encounter for all-drug overdose

Any record from the emergency department dataset with a drug overdose code in any position

ICD-10-CM	Description
T36-T50 with an intent character of 1 Note: Intent information is captured in the 5th character of the following codes: T36.9, T37.9, T39.9, T41.4, T42.7, T43.9, T45.9, T47.9, and T49.9. Intent is captured in 6th character of all other T36-T50 codes	Unintentional poisoning by drugs, medicaments, and biological substances

Regular expression:

((T3[679]9|T414|T427|T4[3579]9)1.|(?!(T3[679]9|T414|T427|T4[3579]9))(T3[6-9]|T4[0-9]|T50)..1)(A|\$\|b)

ED encounter for cannabis use

Any record from the emergency department dataset with a cannabis-related ICD-10 code in any diagnosis position:

ICD-10-CM	Description
T40.7 with 6th character of 1,2,3,4,5 (includes adverse effects; excludes underdosing)	Poisoning or adverse effects of cannabis
F12	Cannabis use, abuse, or dependence

Communicable Disease Page

Sexually transmitted diseases and hepatitis table

Chlamydia

Any record from the MIDIS analyst files with a condition of chlamydia

Gonorrhea

Any record from the MIDIS analyst files with a condition of gonorrhea

Hepatitis C, acute

Any record from the MIDIS analyst files with a condition of Hepatitis C, acute

Hepatitis C, chronic

Any record from the MIDIS analyst files with a condition of Hepatitis C, chronic

Syphilis, all stages except congenital

Any record from the MIDIS analyst files with a condition of syphilis, except for congenital syphilis

Enteric Disease table

Shiga toxin producing E.coli (STEC)

Any record from the MIDIS analyst files with a condition of STEC

Salmonellosis

Any record from the MIDIS analyst files with a condition of salmonellosis

Campylobacteriosis

Any record from the MIDIS analyst files with a condition of campylobacteriosis

Count of reportable diseases chart

For this chart, each record from the reportable disease case files were matched to their program area. COVID-19 cases were excluded from this analysis. HIV cases were grouped into general communicable diseases rather than being a standalone category due to the sensitive nature of this disease and the small number of cases, even when data is aggregated over five years. Counts were then generated for each program area, and percents were calculated for each program area by dividing the count for the program area by the total number of reportable diseases.

Index

Acknowledgments

Thank you to Hannah Yang who wrote and published the original indicator [definition manual for the injury and overdose indicators](#). All of the injury and overdose indicators and their descriptions in this guide are adapted from Hannah's original work. These indicators are published on the [Injury and Overdose Indicators dashboard](#).

Thank you to each of the data source owners who contributed their time. The dashboard would not have been possible without your efforts. We deeply appreciate your ongoing collaboration.

Suggested Citations

Vital Statistics

Montana Department of Public Health and Human Services, Montana Vital Statistics Analysis Unit, 2019-2023, Montana Community Health Insights, [date of accessing the data].

MHDD

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BRFSS

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Census

U.S. Census Bureau, "American Community Survey 5-Year Estimates: Comparison Profiles 5-Year," 2023, <<http://api.census.gov/data/2023/acs/acs5>>, accessed on [date].

CDC PLACES

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Tumor Registry

Montana Department of Public Health and Human Services, Montana Central Tumor Registry, 2018-2022, Montana Community Health Insights, [date of accessing the data].