

State Injury Indicators Report

Instructions for Preparing
2016 Mortality Data



National Center for Injury Prevention and Control
Division of Analysis, Research and Practice Integration



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National Center for Injury Prevention and Control
Division of Analysis, Research and Practice Integration

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FOREWORD AND UPDATES

The Centers for Disease Control and Prevention's (CDC) National Center for Injury Prevention and Control (NCIPC) is pleased to provide this document to guide you in preparing the 2016 mortality state injury indicators.

Under Funding Opportunity Announcement CE16-1602, 23 states have been funded to collect and submit state injury indicator data; however, all states and U.S. territories are eligible to voluntarily submit data for inclusion in the multistate State Injury Indicators products. As more states and U.S. territories voluntarily participate in this surveillance effort, a broader picture of the burden of injuries can be presented and priorities for prevention can be targeted. During the 2014 data collection cycle, 38 states participated by submitting data for inclusion in the multistate products. We look forward to continuing our work together to advance and improve injury surveillance.

The methods outlined in this document are consistent with those used in previous cycles of injury indicator data collection. These methods are based on recommendations presented in the "Consensus Recommendations for Using Hospital Discharge Data for Injury Surveillance" and in the National Public Health Surveillance System (NPHSS) indicators developed by the State and Territorial Injury Prevention Directors Association (STIPDA; now known as the Safe States Alliance) and the Council of State and Territorial Epidemiologists (CSTE). With partner feedback, CDC continuously modifies and updates the instructions and methodologies outlined in this document.

Changes for the 2016 Data collection cycle include:

Coding of medical provider data used for injury surveillance was updated to the International Classification of Diseases—Tenth Revision—Clinical Modification (ICD-10-CM) on October 1, 2015. The transition of injury surveillance methods is currently in the consensus-building process with state and federal partners. The CSTE-facilitated group's final recommendations are nearly complete, but important methodological considerations remain under investigation. The CSTE website has further information on the workgroup and will have the interim and final reports once completed.¹

Epidemiologists using ICD-10-CM coded data should refer to the CDC proposed injury case definitions² and analysis frameworks.^{3,4} However, modifications to these recommendations are expected as a result of consensus-building process. The Safe States publication "The Transition from ICD-9-CM to ICD-10-CM: Guidance for analysis and reporting of injuries by mechanism and intent" is an excellent starting place for initial guidance in analyzing ICD-10-CM coded data.⁵

CDC is only asking for 2016 ICD-10 coded mortality data from the states submitting data this year. We are not asking for hospitalization or emergency department data because there are no finalized ICD-10-CM methods for these data. There are no changes to the data collection methods for use with death data. Injury surveillance methods for use with ICD-10-CM coded hospitalization and emergency department data are expected to be finalized for the 2017 data collection cycle. At that point states will have the opportunity to submit both 2016 and 2017 ICD-10-CM coded data.

ABBREVIATIONS

BAC	Blood alcohol concentration
BRFSS	Behavioral Risk Factor Surveillance System
CDC	Centers for Disease Control and Prevention
CSTE	Council of State and Territorial Epidemiologists
FARS	Fatality Analysis Reporting System
HDD	Hospital discharge data
ICD-10	International Classification of Diseases—Tenth Revision
ICD-10-CM	International Classification of Diseases—Tenth Revision—Clinical Modification
ICD-9-CM	International Classification of Diseases—Ninth Revision—Clinical Modification
MVC	Motor vehicle crash
NCHS	National Center for Health Statistics
NCIPC	National Center for Injury Prevention and Control
NHTSA	National Highway Traffic Safety Administration
NPHSS	National Public Health Surveillance System
OSELS	Office of Surveillance, Epidemiology, and Laboratory Services
SAVIR	Society for Advancement of Violence and Injury Research
STIPDA	State and Territorial Injury Prevention Directors Association (currently Safe States Alliance)
TBI	Traumatic brain injury
VA	Veterans Affairs
WHO	World Health Organization
WISQARS	Web-based Injury Statistics Query and Reporting System
YRBS	Youth Risk Behavior Survey

CONTENTS

Foreword and Updatesiv
Abbreviations	v
Introduction	1
Background and Purpose	3
Preparing the Mortality Data Set	4
Additional Resources	5
Injury Indicators	7
All-Injury Indicator 1: Injury Fatalities	8
Drowning Indicator 1: Unintentional Drowning Fatalities	9
Fall Indicator 1: Unintentional Fall-Related Fatalities	10
Fall Indicator 2: Falls in Adults Aged 45 years or Older	11
Fall Indicator 3: Falls in Adults Aged 45 years or Older That Caused an Injury	12
Fire-Related Indicator 1: Unintentional Fire-Related Fatalities	13
Firearm-Related Indicator 1: Firearm-Related Fatalities	14
Homicide/Assault Indicator 1: Homicides	15
Motor Vehicle Indicator 1: Motor Vehicle Traffic Fatalities	16
Motor Vehicle Indicator 2: Seat Belt Use	17
Motor Vehicle Indicator 3: Drinking and Driving	18
Motor Vehicle Indicator 4: Alcohol-Related Crash Deaths	19
Poisoning Indicator 1: Poisoning Fatalities	20
Poisoning Indicator 2: Drug Overdose Fatalities	21
Suicide/Suicide Attempt Indicator 1: Suicides	22
Traumatic Brain Injury Indicator 1: Traumatic Brain Injury Fatalities	23
Calculating and Submitting Rates	24
References	26

What is an Injury Indicator?

An injury indicator describes a health outcome of an injury, such as hospitalization or death, or a factor known to be associated with an injury, such as a risk or protective factor among a specified population.

INTRODUCTION

Injury surveillance is one of the most important and basic elements of injury prevention and control. It helps determine the magnitude of injury morbidity and mortality, the leading causes of injury, and the population groups and behaviors associated with the greatest risk of injury. Surveillance data are also fundamental to determining program and prevention priorities. Furthermore, these data are crucial for evaluating the effectiveness of program activities and for identifying problems that need further investigation.

Injury continues to be the leading cause of death and disability among children and young adults.⁶ In 2016, almost 232,000 people died from injuries in the U.S. Among them: about 25% died from unintentional poisonings; 19% died from suicide; 17% died from motor-vehicle crashes; and 8% died from homicide.⁶ In 2015, almost 32 million people were treated for injuries in U.S. emergency departments.⁶ The total lifetime medical and work loss costs of injuries and violence in the United States was \$671 billion in 2013.^{7,8}

The mission of public health includes prevention, mitigation, assurance that the injured have access to treatment, and the reduction of injury-related disability and death.⁹ The scope of public health encompasses injuries involving any mechanism (e.g., firearm, motor vehicle, or burn) and includes both violence and unintentional injuries. An important part of the public health mission is to emphasize that injuries are preventable and to dispel the misconception that injuries are unavoidable.

Recognizing the need for more comprehensive injury surveillance data, the State and Territorial Injury Prevention Directors Association (STIPDA) produced *Consensus Recommendations for Injury Surveillance in State Health Departments* in 1999.¹⁰ These recommendations were developed by a working group representing STIPDA; the Council of State and Territorial Epidemiologists (CSTE); the Centers for Disease Control and Prevention (CDC) and its National Center for Injury Prevention and Control (NCIPC); the Society for Advancement of Violence and Injury Research (SAVIR); and individual state partners. While these recommendations were updated in 2007,¹¹ they remain a foundational building block for injury surveillance.

The *State Health Department Consensus Recommendations* identifies specific injuries and injury risk factors to be placed under surveillance by all states and data sets to monitor these injuries and risk factors. The goal is to improve state-based injury surveillance to better support injury prevention programs and policies. By enhancing and standardizing injury surveillance at the state level, its integration with overall public health surveillance as part of the National Public Health Surveillance System (NPHSS) will be much easier.¹² In tandem with the *State Health Department Consensus Recommendations*, CSTE and STIPDA developed injury indicators that were formally adopted for inclusion in NPHSS.^{13,14} The NPHSS injury indicators add to other indicators developed by CSTE for chronic diseases and other areas.¹³

The *Consensus Recommendations for Using Hospital Discharge Data for Injury Surveillance*, published in 2003, provides clear and specific recommendations about the evaluation and use of hospital discharge data.¹⁵ It presents important considerations for the evaluation of data quality and outlines the methodology for developing an injury hospitalization data set. Specific recommendations for the use of emergency department data for injury surveillance were included in the 2007 version of the *Consensus recommendations for injury surveillance in state health departments*.¹¹

Collection and dissemination of injury indicators is built upon the foundation laid by the publication of these Safe States Alliance (formerly known as STIPDA) and CSTE documents.

BACKGROUND AND PURPOSE

This manual was created to guide states and U.S. territories in collecting, preparing, and submitting injury surveillance data. All states and U.S. territories are eligible to voluntarily submit data.

Information obtained from participants will be reviewed and assembled for inclusion in various State Injury Indicators products. This process provides state and U.S. territory injury programs with a standardized method for evaluating injury data and for producing an injury indicator data product that is comparable across states and U.S. territories.

This manual provides straightforward information to encourage participation of all states and U.S. territories regardless of their epidemiologic infrastructure and capabilities. Participation in this report should not be seen as limiting by states of higher capacity, but rather as a place of commonality and a starting point for developing more sophisticated analyses.

For 2016, statewide, centralized electronic vital statistics data are used to calculate the indicators prepared and submitted by states and U.S. territories. The indicators based on hospital discharge and emergency department data are not requested at this time because the ICD-10-CM recommendations are not yet finalized. Injuries resulting in or occurring from the following are currently included in the *State Injury Indicators*: all injury, drowning, fall-related injury, fire-related injury, firearm-related injury, homicide/assault, motor vehicle-related injury, poisoning, suicide/suicide attempt, and traumatic brain injury (TBI). Overlap exists among these indicators. For example, a firearm-related homicide would be included in both the firearm-related death indicator and the homicide indicator.

PREPARING THE MORTALITY DATA SET

Background on State Vital Records

Death registration is the responsibility of individual states. The funeral director and the physician who certify the cause of death are usually responsible for the personal and medical information recorded on the death certificate. The cause-of-death section on the certificate is generally the same in all states and is organized according to World Health Organization (WHO) guidelines and coded with ICD-10.¹⁶ Local registrars assure that deaths in their jurisdictions are registered and that required information is on death certificates before submitting to the state registrar. State registrars number and file the death certificates; certificates of nonresidents are sent to their states of residence. All states send death certificate data to the National Vital Statistics System, managed by CDC's National Center for Health Statistics (NCHS).¹⁷

Data are limited to information reported on death certificates. The degree of detail in reporting varies among jurisdictions. In general, death certificate data provide limited information about circumstances of injury incidents or contributing factors. The number and type of cause-of-death fields to which states have access also vary, and deaths associated with some injuries, especially suicide, may be underreported. States without access to multiple contributing cause-of-death fields cannot calculate fatality rates for TBI because the diagnostic codes that make up that case definition reside in the contributing cause-of-death fields.

Instructions for Using Vital Statistics Data

Vital statistics data do not require specific preparation for analysis. Include all records with a date of death between January 1, 2016 and December 31, 2016. With the exception of the fatal TBI indicator, all fatal indicators should be calculated by searching the underlying-cause-of-death field only. For the fatal TBI indicator, first limit the dataset to only deaths with an injury underlying cause of death (V01–Y36, Y85–Y87, Y89, *U01–*U03), and then search *all fields* in the multiple cause of death file. Specific code ranges are identified in the individual indicator pages (see pages 8–23). Deaths should be age-adjusted to the 2000 standard using the NCHS population distribution (Table 1, page 25).

ADDITIONAL RESOURCES

Other Recommended Data Systems

Indicators based on the Behavioral Risk Factor Surveillance System (BRFSS), the Youth Risk Behavior Survey (YRBS), and the Fatality Analysis Reporting System (FARS) will be calculated at CDC. The data available from YRBS and BRFSS will be examined annually to determine which survey questions should be included.

Behavioral Risk Factor Surveillance System (BRFSS)

CDC's National Center for Chronic Disease Prevention and Health Promotion currently manages the BRFSS. This is a broad ongoing survey that is a state-based, random-digit-dialed telephone survey of the noninstitutionalized U.S. population over age 17. BRFSS monitors risk behaviors associated with the leading causes of disease, injury, and death.¹⁸

Because BRFSS is telephone-based, population subgroups less likely to have telephones, such as persons of low socioeconomic status, may be underrepresented. However, beginning in 2011, BRFSS began to include data from cell phone users to better represent the U.S. population.¹⁹ Additionally, data are self-reported and may be biased. For risk-reduction factors such as self-reported use or testing of smoke alarms, these data may not uniformly represent safe and effective use.¹⁸

Not all BRFSS questions are asked every year. Questions asked during the year for which a current Injury Indicator Report is being prepared will be reviewed and appropriate questions included in the report. Results will be reported as a percentage of respondents. For 2016, there are four injury-related BRFSS questions that will be reported.

Youth Risk Behavior Survey (YRBS)

The YRBS is managed by the CDC's Division of Adolescent and School Health in the National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention. The YRBS monitors risk behaviors associated with the leading causes of injury and death among teenagers.²⁰ State and local departments of education and health conduct the survey biennially in many locations throughout the country. The school-based survey is administered to 9th through 12th graders and the data is analyzed by CDC. YRBS data apply only to youth who attend school. The extent of underreporting or overreporting of behaviors cannot be determined, although the survey questions demonstrate good test-retest reliability. Interstate comparisons must be interpreted cautiously because the methods used to collect YRBS data may vary.²⁰

In 2015, 37 states conducted YRBS with overall participation rates of at least 60%.²¹ CDC requires a minimum overall participation rate of 60% to generalize the results to the state's population. States with YRBS data meeting this criterion will be included. Results will be reported as a percentage of respondents. No age adjustment will be applied. The YRBS was not administered in 2016.

Fatality Analysis Reporting System (FARS)

FARS, coordinated by the National Highway Traffic Safety Administration (NHTSA), contains data on all fatal traffic crashes that occur in the 50 states, the District of Columbia, and Puerto Rico. For inclusion in FARS, a crash must involve a motor vehicle traveling on a public roadway and result in the death of a person (either a vehicle occupant or a non-motorist) within 30 days of the crash. The FARS file contains a description of each fatal crash reported. More than 100 coded data elements characterize each crash, the vehicles, and the people involved.²²

FARS does not include non-traffic crashes such as those occurring on driveways and other private property. It also does not include deaths occurring more than 30 days after the motor vehicle crash.²²

INJURY INDICATORS

The following pages contain specific case definitions for each of the individual mortality injury indicators. Once the case counts are determined, they should be entered into the provided spreadsheets for rate calculation and submission to CDC.

The following morbidity indicators are not being collected at this time

- Hospitalizations for All Injuries
- Emergency Department Visits for All Injuries
- Drowning-Related Hospitalizations
- Drowning-Related Emergency Department Visits
- Unintentional Fall-Related Hospitalizations
- Unintentional Fall-Related Emergency Department Visits
- Hip Fracture Hospitalizations in Persons Aged 65 Years and Older
- Hip Fracture Emergency Department Visits in Persons Aged 65 Years and Older
- Unintentional Fire-Related Hospitalizations
- Unintentional Fire-Related Emergency Department Visits
- Firearm-Related Hospitalizations
- Firearm-Related Emergency Department Visits
- Assault-Related Hospitalizations
- Assault-Related Emergency Department Visits
- Motor Vehicle Traffic Hospitalizations
- Motor Vehicle Traffic Emergency Department Visits
- Poisoning Hospitalizations
- Poisoning Emergency Department Visits
- Suicide Attempt Hospitalizations
- Suicide Attempt Emergency Department Visits
- Traumatic Brain Injury Hospitalizations
- Traumatic Brain Injury Emergency Department Visits

ALL-INJURY INDICATOR 1: Injury Fatalities

DEMOGRAPHIC GROUP All residents.

NUMERATOR Deaths with any of the following ICD-10 codes as an underlying cause of death.

Injury Fatality ICD-10 Codes

CODE(S)	DESCRIPTION
V01–Y36, Y85–Y87, Y89, *U01–*U03	Injury and poisoning

DENOMINATOR Midyear population for the calendar year under surveillance (see instructions on page 24).

MEASURES OF FREQUENCY Annual number of deaths. Annual mortality rate—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).²³ Rates should be calculated for age and sex.

DATA RESOURCES Death certificate data from vital statistics agencies (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

PERIOD FOR CASE DEFINITION Calendar year based on date of death.

BACKGROUND Injuries are the leading cause of death for people 1 to 44 years of age and the third leading cause of death overall.⁶ Almost 232,000 people died from injuries in 2016.⁶

LIMITATIONS OF INDICATOR Injuries severe enough to result in death represent only a small proportion of the overall burden of injury. An evaluation of only these injuries may not present an accurate picture of the causes of less-severe injuries.

LIMITATIONS OF DATA RESOURCES The accuracy of indicators based on codes found in vital statistics data is limited by the completeness and quality of coding. The overall completeness of external cause coding on death data is uniformly high. Coding criteria specify that all cases of injury death must contain an injury code in the underlying-cause-of-death field.

HEALTHY PEOPLE 2020 OBJECTIVES IVP-1.1: Reduce fatal injuries.
IVP-11: Reduce unintentional injury deaths.

DROWNING INDICATOR 1: Unintentional Drowning Fatalities

DEMOGRAPHIC GROUP All residents.

NUMERATOR Deaths with any of the following ICD-10 codes as an underlying cause of death.

Unintentional Drowning Fatality ICD-10 Codes

CODE(S)	DESCRIPTION
W65–W74	Accidental drowning and submersion
V90	Accident to watercraft causing drowning and submersion
V92	Water-transport-related drowning and submersion without accident to watercraft

DENOMINATOR Midyear population for the calendar year under surveillance (see instructions on page 24).

MEASURES OF FREQUENCY Annual number of deaths. Annual mortality rate—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).²³ Rates should be calculated for age and sex.

DATA RESOURCES Death certificate data from vital statistics agencies (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

PERIOD FOR CASE DEFINITION Calendar year based on date of death.

BACKGROUND Drowning is one of the 10 leading causes of injury death for persons under age 55 years. In the United States, drowning rates are highest among children under five years of age.⁶

LIMITATIONS OF INDICATOR Injuries severe enough to result in death represent only a small proportion of the overall burden of injury. An evaluation of only these injuries may not present an accurate picture of the causes of less-severe injuries

LIMITATIONS OF DATA RESOURCES The accuracy of indicators based on codes found in vital statistics data is limited by the completeness and quality of coding. The overall completeness of external cause coding on death data is uniformly high. Coding criteria specify that all cases of injury death must contain an injury code in the underlying-cause-of-death field.

HEALTHY PEOPLE 2020 OBJECTIVES IVP-25: Reduce drowning deaths.

FALL INDICATOR 1:

Unintentional Fall-Related Fatalities

DEMOGRAPHIC GROUP All residents.

NUMERATOR Deaths with any of the following ICD-10 codes as an underlying cause of death.

Unintentional Drowning Fatality ICD-10 Codes

CODE(S)	DESCRIPTION
W00–W19	Falls

DENOMINATOR Midyear population for the calendar year under surveillance (see instructions on page 24).

MEASURES OF FREQUENCY Annual number of deaths. Annual mortality rate—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).²³ Rates should be calculated for age and sex.

DATA RESOURCES Death certificate data from vital statistics agencies (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

PERIOD FOR CASE DEFINITION Calendar year based on date of death.

BACKGROUND Unintentional falls are the third leading cause of injury death overall and the leading cause of injury death in people 65 years and older.⁶ In 2016, there were over 34,000 unintentional fall-related deaths.⁶

LIMITATIONS OF INDICATOR Injuries severe enough to result in death represent only a small proportion of the overall burden of injury. An evaluation of only these injuries may not present an accurate picture of the causes of less-severe injuries.

LIMITATIONS OF DATA RESOURCES The accuracy of indicators based on codes found in vital statistics data is limited by the completeness and quality of coding. The overall completeness of external cause coding on death data is uniformly high. Coding criteria specify that all cases of injury death must contain an injury code in the underlying-cause-of-death field.

HEALTHY PEOPLE 2020 OBJECTIVES IVP-23: Prevent an increase in the rate of fall-related deaths.

FALL INDICATOR 2: **Falls in Adults Aged 45 years or Older**

This indicator will be calculated at CDC.

DEMOGRAPHIC GROUP	Resident persons aged 45 years or older.
NUMERATOR	Those respondents who experienced a fall.
DENOMINATOR	Respondents aged 45 years or older.
MEASURES OF FREQUENCY	Annual prevalence—crude.
DATA RESOURCES	Data from the Behavioral Risk Factor Surveillance System (BRFSS). ¹⁸
PERIOD FOR CASE DEFINITION	Past 3 months.
BACKGROUND	More than one third of adults aged 65 years or older fall each year in the United States. ^{24, 25} Many people who fall, even those who are not injured, develop a fear of falling. This fear may cause them to limit their activities, leading to reduced mobility and physical fitness and increasing their actual risk of falling. ²⁶
LIMITATIONS OF INDICATOR	Self-reported data only represent a small portion of the overall burden of injury. An evaluation of only these injuries may not present an accurate picture of all injuries.
LIMITATIONS OF DATA RESOURCES	As with all self-reported sample surveys, BRFSS data might be subject to systematic error resulting from noncoverage (e.g., lower telephone coverage among populations of low socioeconomic status), nonresponse (e.g., refusal to participate in the survey or to answer specific questions), or measurement (e.g., social desirability or recall bias).
HEALTHY PEOPLE 2020 OBJECTIVES	No objective.

FALL INDICATOR 3: **Falls in Adults Aged 45 years or Older That Caused an Injury**

This indicator will be calculated at CDC.

DEMOGRAPHIC GROUP	Resident persons aged 45 years or older.
NUMERATOR	Those respondents who experienced a fall that caused them to limit their regular activities for at least a day or to go see a doctor.
DENOMINATOR	Respondents aged 45 years or older who experienced a fall.
MEASURES OF FREQUENCY	Annual prevalence—crude.
DATA RESOURCES	Data from the Behavioral Risk Factor Surveillance System (BRFSS). ¹⁸
PERIOD FOR CASE DEFINITION	Past 3 months.
BACKGROUND	More than 5 million people aged 45 years or older were treated in emergency departments in 2015 for injuries related to unintentional falls. ⁶
LIMITATIONS OF INDICATOR	Self-reported data only represent a small portion of the overall burden of injury. An evaluation of only these injuries may not present an accurate picture of all injuries.
LIMITATIONS OF DATA RESOURCES	As with all self-reported sample surveys, BRFSS data might be subject to systematic error resulting from noncoverage (e.g., lower telephone coverage among populations of low socioeconomic status), nonresponse (e.g., refusal to participate in the survey or to answer specific questions), or measurement (e.g., social desirability or recall bias).
HEALTHY PEOPLE 2020 OBJECTIVES	No objective.

FIRE-RELATED INDICATOR 1: Unintentional Fire-Related Fatalities

DEMOGRAPHIC GROUP All residents.

NUMERATOR Deaths with any of the following ICD-10 codes as an underlying cause of death.

Unintentional Drowning Fatality ICD-10 Codes

CODE(S)	DESCRIPTION
X00–X09	Exposure to smoke, fire, and flames

DENOMINATOR Midyear population for the calendar year under surveillance (see instructions on page 24).

MEASURES OF FREQUENCY Annual number of deaths. Annual mortality rate—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).²³ Rates should be calculated for age and sex.

DATA RESOURCES Death certificate data from vital statistics agencies (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

PERIOD FOR CASE DEFINITION Calendar year based on date of death.

BACKGROUND The United States mortality rate from fires ranks sixth among the 25 developed countries for which statistics are available.²⁷ Four out of five deaths in 2005 occurred in homes²⁸ and approximately half of home fire deaths occurred in homes without fire alarms.²⁹

LIMITATIONS OF INDICATOR Injuries severe enough to result in death represent only a small proportion of the overall burden of injury. An evaluation of only these injuries may not present an accurate picture of the causes of less-severe injuries.

LIMITATIONS OF DATA RESOURCES The accuracy of indicators based on codes found in vital statistics data is limited by the completeness and quality of coding. The overall completeness of external cause coding on death data is uniformly high. Coding criteria specify that cases of injury death must contain an injury code in the underlying-cause-of-death field.

HEALTHY PEOPLE 2020 OBJECTIVES IVP-28: Reduce residential fire deaths.

FIREARM-RELATED INDICATOR 1:

Firearm-Related Fatalities

DEMOGRAPHIC GROUP All residents.

NUMERATOR Deaths with any of the following ICD-10 codes as an underlying cause of death.

Firearm-Related Fatality ICD-10 Codes

CODE(S)	DESCRIPTION
W32–W34	Exposure to inanimate mechanical forces—firearm discharge
X72–X74	Intentional self-harm by firearm discharge
X93–X95	Assault by firearm discharge
Y22–Y24	Firearm discharge of undetermined intent
Y35.0	Legal intervention involving firearm discharge
*U01.4	Terrorism involving firearms

DENOMINATOR Midyear population for the calendar year under surveillance (see instructions on page 24).

MEASURES OF FREQUENCY Annual number of deaths. Annual mortality rate—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).²³ Rates should be calculated for age and sex.

DATA RESOURCES Death certificate data from vital statistics agencies (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

PERIOD FOR CASE DEFINITION Calendar year based on date of death.

BACKGROUND Firearm-related injuries accounted for over 38,000 deaths in 2016. Nationally, the firearm-related death rate for males is six times higher than that of females.⁶

LIMITATIONS OF INDICATOR Injuries severe enough to result in death represent only a small proportion of the overall burden of injury. An evaluation of only these injuries may not present an accurate picture of the causes of less-severe injuries.

LIMITATIONS OF DATA RESOURCES The accuracy of indicators based on codes found in vital statistics data is limited by the completeness and quality of coding. The overall completeness of external cause coding on death data is uniformly high. Coding criteria specify that all cases of injury death must contain an injury code in the underlying-cause-of-death field.

HEALTHY PEOPLE 2020 OBJECTIVES IVP-30: Reduce firearm-related deaths.

HOMICIDE/ASSAULT INDICATOR 1:

Homicides

DEMOGRAPHIC GROUP All residents.

NUMERATOR Deaths with any of the following ICD-10 codes as an underlying cause of death.

Homicide ICD-10 Codes

CODE(S)	DESCRIPTION
X85–Y09	Assault
Y87.1	Sequelae of assault
*U01	Terrorism-assault
*U02	Sequelae of terrorism-assault

DENOMINATOR Midyear population for the calendar year under surveillance (see instructions on page 24).

MEASURES OF FREQUENCY Annual number of deaths. Annual mortality rate—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).²³ Rates should be calculated for age and sex.

DATA RESOURCES Death certificate data from vital statistics agencies (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

PERIOD FOR CASE DEFINITION Calendar year based on date of death.

BACKGROUND Homicide is the sixteenth leading cause of death in the United States; it is the third most common cause of death among persons 15 to 34 years.⁶

LIMITATIONS OF INDICATOR Injuries severe enough to result in death represent only a small proportion of the overall burden of injury. An evaluation of only these injuries may not present an accurate picture of the causes of less-severe injuries.

LIMITATIONS OF DATA RESOURCES The accuracy of indicators based on codes found in vital statistics data is limited by the completeness and quality of coding. The overall completeness of external cause coding on death data is uniformly high. Coding criteria specify that all cases of injury death must contain an injury code in the underlying-cause-of-death field.

HEALTHY PEOPLE 2020 OBJECTIVES IVP-29: Reduce homicides.

MOTOR VEHICLE INDICATOR 1:

Motor Vehicle Traffic Fatalities

DEMOGRAPHIC GROUP All residents.

NUMERATOR Deaths with any of the following ICD-10 codes as an underlying cause of death.

Motor Vehicle Traffic Fatality ICD-10 Codes

CODE(S)	DESCRIPTION
V02–V04 (.1, .9), V09.2	Pedestrian injured in transport accident
V12–V14 (.3–.9), V19 (.4–.6)	Pedal cyclist injured in transport accident
V20–V28 (.3–.9), V29 (.4–.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–.5), V81.1, V82.1, V83–V86 (.0–.3), V87 (.0–.8), V89.2	Other land transport accidents

DENOMINATOR Midyear population for the calendar year under surveillance (see instructions on page 24).

MEASURES OF FREQUENCY Annual number of deaths. Annual mortality rate—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).²³ Rates should be calculated for age and sex.

DATA RESOURCES Death certificate data from vital statistics agencies (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

PERIOD FOR CASE DEFINITION Calendar year based on date of death.

BACKGROUND Motor vehicle crashes are the second leading cause of injury death in the United States. They are also the second leading injury cause for years of potential life lost⁶

LIMITATIONS OF INDICATOR Injuries severe enough to result in death represent only a small proportion of the overall burden of injury. An evaluation of only these injuries may not present an accurate picture of the causes of less-severe injuries.

LIMITATIONS OF DATA RESOURCES The accuracy of indicators based on codes found in vital statistics data is limited by the completeness and quality of coding. The overall completeness of external cause coding on death data is uniformly high. Coding criteria specify that all cases of injury death must contain an injury code in the underlying-cause-of-death field.

HEALTHY PEOPLE 2020 OBJECTIVES IVP-13: Reduce motor vehicle crash-related deaths.
 IVP-18: Reduce pedestrian deaths on public roads.
 IVP-20: Reduce pedalcyclist deaths on public roads.

MOTOR VEHICLE INDICATOR 2: Seat Belt Use

This indicator will be calculated at CDC.

DEMOGRAPHIC GROUP	Resident persons aged 18 years or older.
NUMERATOR	Those respondents reporting wearing their seatbelt “always” or “almost always” when driving or riding in a car.
DENOMINATOR	Respondents aged 18 years or older.
MEASURES OF FREQUENCY	Annual prevalence—crude.
DATA RESOURCES	Data from the Behavioral Risk Factor Surveillance System (BRFSS). ¹⁸
PERIOD FOR CASE DEFINITION	No time frame.
BACKGROUND	Seat belts dramatically reduce risk of death and serious injury. Among drivers and front-seat passengers, seat belts reduce the risk of death by 45%, and cut the risk of serious injury by 50%. ³⁰
LIMITATIONS OF INDICATOR	Self-reported data only represent a small portion of the overall burden of injury. An evaluation of only these injuries may not present an accurate picture of all injuries.
LIMITATIONS OF DATA RESOURCES	As with all self-reported sample surveys, BRFSS data might be subject to systematic error resulting from noncoverage (e.g., lower telephone coverage among populations of low socioeconomic status), nonresponse (e.g., refusal to participate in the survey or to answer specific questions), or measurement (e.g., social desirability or recall bias).
HEALTHY PEOPLE 2020 OBJECTIVES	IVP-15: Increase use of safety belts.

MOTOR VEHICLE INDICATOR 3: Drinking and Driving

This indicator will be calculated at CDC.

DEMOGRAPHIC GROUP	Resident persons aged 18 years or older reporting drinking at least one alcoholic beverage in the past 30 days.
NUMERATOR	Those respondents reporting driving one or more times after perhaps having too much to drink in the past 30 days.
DENOMINATOR	Respondents aged 18 years or older reporting having a specific number of drinks on one occasion during the previous month (including unknowns and refusals).
MEASURES OF FREQUENCY	Annual prevalence—crude.
DATA RESOURCES	Data from the Behavioral Risk Factor Surveillance System (BRFSS). ¹⁸
PERIOD FOR CASE DEFINITION	Previous month.
BACKGROUND	In 2016, more than 1 million drivers were arrested for driving under the influence of alcohol or narcotics. ³¹ That's one percent of the 111 million self-reported episodes of alcohol-impaired driving among U.S. adults each year. ³²
LIMITATIONS OF INDICATOR	Self-reported data only represent a small portion of the overall burden of injury. An evaluation of only these injuries may not present an accurate picture of all injuries.
LIMITATIONS OF DATA RESOURCES	As with all self-reported sample surveys, BRFSS data might be subject to systematic error resulting from noncoverage (e.g., lower telephone coverage among populations of low socioeconomic status), nonresponse (e.g., refusal to participate in the survey or to answer specific questions), or measurement (e.g., social desirability or recall bias).
HEALTHY PEOPLE 2020 OBJECTIVES	No objective.

MOTOR VEHICLE INDICATOR 4: **Alcohol-Related Crash Deaths**

This indicator will be calculated at CDC.

DEMOGRAPHIC GROUP	All residents.
NUMERATOR	Alcohol-related death of a person involved in crash of a motor vehicle traveling on a public roadway and occurring within 30 days of the crash. Deaths are considered alcohol related if either a driver or nonoccupant (e.g., pedestrian or bicyclist) had a blood alcohol concentration (BAC) greater than or equal to 0.01 g/dL. ²²
DENOMINATOR	Midyear population for the calendar year under surveillance
MEASURES OF FREQUENCY	Annual number of deaths. Annual mortality rate—crude.
DATA RESOURCES	Fatality Analysis Reporting System (FARS) coordinated by the National Highway Traffic Safety Administration (NHTSA) (numerator) ²² and population estimates from the U.S. Census Bureau or suitable alternative (denominator).
PERIOD FOR CASE DEFINITION	Calendar year based on the year of the crash.
BACKGROUND	In 2016, 10,497 people died in alcohol-impaired driving crashes, accounting for over a quarter (28%) of all traffic-related deaths in the United States. ³³ Of the 1,233 traffic deaths among children ages 0 to 14 years in 2016, 214 (17%) involved an alcohol-impaired driver. ³³
LIMITATIONS OF INDICATOR	Injuries severe enough to result in death represent only a small proportion of the overall burden of injury. An evaluation of only these injuries may not present an accurate picture of the causes of less severe injuries.
LIMITATIONS OF DATA RESOURCES	FARS does not include nontraffic crashes such as those occurring on driveways and other private property. In addition, it does not include deaths that occur more than 30 days after the motor vehicle crash. Because blood alcohol levels are not available on all fatalities, the estimates are based on a discriminant analysis of information from all cases where BAC data are available.
HEALTHY PEOPLE 2020 OBJECTIVES	SA-17: Decrease the rate of alcohol-impaired driving (.08+ blood alcohol content [BAC]) fatalities.

POISONING INDICATOR 1:

Poisoning Fatalities

DEMOGRAPHIC GROUP All residents.

NUMERATOR Deaths with any of the following ICD-10 codes as an underlying cause of death.

Poisoning Fatality ICD-10 Codes

CODE(S)	DESCRIPTION
X40–X49	Accidental poisoning by and exposure to noxious substances
X60–X69	Intentional self-poisoning
X85–X90	Assault by poisoning
Y10–Y19	Poisoning of undetermined intent
Y35.2	Legal intervention involving gas
*U01 (.6–.7)	Terrorism involving biological or chemical weapons

DENOMINATOR Midyear population for the calendar year under surveillance (see instructions on page 24).

MEASURES OF FREQUENCY Annual number of deaths. Annual mortality rate—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).²³ Rates should be calculated for age and sex.

DATA RESOURCES Death certificate data from vital statistics agencies (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

PERIOD FOR CASE DEFINITION Calendar year based on date of death.

BACKGROUND In 2016, almost 69,000 people in the United States died from poisoning.⁶

LIMITATIONS OF INDICATOR Injuries severe enough to result in death represent only a small proportion of the overall burden of injury. An evaluation of only these injuries may not present an accurate picture of the causes of less-severe injuries.

LIMITATIONS OF DATA RESOURCES The accuracy of indicators based on codes found in vital statistics data is limited by the completeness and quality of coding. The overall completeness of external cause coding on death data is uniformly high. Coding criteria specify that cases of injury death must contain an injury code in the underlying-cause-of-death field.

HEALTHY PEOPLE 2020 OBJECTIVES IVP-9: Prevent an increase in the rate of poisoning deaths.
 MPS-2.4: (Developmental) Reduce deaths from the use of pain medicines.
 SA-12: Reduce drug-induced deaths.

POISONING INDICATOR 2: Drug Overdose Fatalities

DEMOGRAPHIC GROUP All residents.

NUMERATOR Deaths with any of the following ICD-10 codes as an underlying cause of death.³⁴

Drug Overdose Fatality ICD-10 Codes

CODE(S)	DESCRIPTION
X40–X44	Accidental poisoning by drugs
X60–X64	Intentional self-poisoning by drugs
X85	Assault by drug poisoning
Y10–Y14	Drug poisoning of undetermined intent

DENOMINATOR Midyear population for the calendar year under surveillance (see instructions on page 24).

MEASURES OF FREQUENCY Annual number of deaths. Annual mortality rate—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).²³ Rates should be calculated for age and sex.

DATA RESOURCES Death certificate data from vital statistics agencies (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

PERIOD FOR CASE DEFINITION Calendar year based on date of death.

BACKGROUND In 2016, drug overdose deaths (63,632) exceeded the number of deaths from motor vehicle traffic crashes (38,748).⁶

LIMITATIONS OF INDICATOR Injuries severe enough to result in death represent only a small proportion of the overall burden of injury. An evaluation of only these injuries may not present an accurate picture of the causes of less-severe injuries.

LIMITATIONS OF DATA RESOURCES The accuracy of indicators based on codes found in vital statistics data is limited by the completeness and quality of coding. The overall completeness of external cause coding on death data is uniformly high. Coding criteria specify that cases of injury death must contain an injury code in the underlying-cause-of-death field.

HEALTHY PEOPLE 2020 OBJECTIVES IVP-9: Prevent an increase in the rate of poisoning deaths.
MPS-2.4: (Developmental) Reduce deaths from the use of pain medicines.
SA-12: Reduce drug-induced deaths.

SUICIDE/SUICIDE ATTEMPT INDICATOR 1:

Suicides

DEMOGRAPHIC GROUP All residents.

NUMERATOR Deaths with any of the following ICD-10 codes as an underlying cause of death.

Suicide ICD-10 Codes

CODE(S)	DESCRIPTION
X60–X84	Intentional self-harm
Y87.0	Sequelae of intentional self-harm
*U03	Terrorism-intentional self-harm

DENOMINATOR Midyear population for the calendar year under surveillance (see instructions on page 24).

MEASURES OF FREQUENCY Annual number of deaths. Annual mortality rate—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).²³ Rates should be calculated for age and sex.

DATA RESOURCES Death certificate data from vital statistics agencies (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

PERIOD FOR CASE DEFINITION Calendar year based on date of death.

BACKGROUND In 2016, suicide was the second leading cause of death among those ages 10 to 34 years.⁶

LIMITATIONS OF INDICATOR Injuries severe enough to result in death represent only a small proportion of the overall burden of injury. An evaluation of only these injuries may not present an accurate picture of the causes of less-severe injuries.

LIMITATIONS OF DATA RESOURCES The accuracy of indicators based on codes found in vital statistics data is limited by the completeness and quality of coding. The overall completeness of external cause coding on death data is uniformly high. Coding criteria specify that cases of injury death must contain an injury code in the underlying-cause-of-death field.

HEALTHY PEOPLE 2020 OBJECTIVES IVP-28: Reduce residential fire deaths.

TRAUMATIC BRAIN INJURY INDICATOR 1:

Traumatic Brain Injury Fatalities

DEMOGRAPHIC GROUP All residents.

NUMERATOR First, limit deaths to those with an injury underlying cause of death (V01–Y36, Y85–Y87, Y89, *U01–*U03). Then select deaths with any of the following ICD-10 codes in any field of the multiple cause of death file.

Motor Vehicle Traffic Fatality ICD-10 Codes

CODE(S)	DESCRIPTION
S01.0–S01.9	Open wound of head
S02.0, S02.1, S02.3, S02.7–S02.9	Fracture of skull and facial bones
S04.0	Injury of optic nerve and pathways
S06.0–S06.9	Intracranial injury
S07.0, S07.1, S07.8, S07.9	Crushing injury of head
S09.7–S09.9	Other and unspecified injuries of head
T01.0*	Open wounds involving head with neck
T02.0*	Fractures involving head with neck
T04.0*	Crushing injuries involving head with neck
T06.0*	Injuries of brain and cranial nerves with injuries of nerves and spinal cord at neck level
T90.1, T90.2, T90.4, T90.5, T90.8, T90.9	Sequelae of injuries of head

* These codes are not considered valid in the U.S.

DENOMINATOR Midyear population for the calendar year under surveillance (see instructions on page 24).

MEASURES OF FREQUENCY Annual number of deaths. Annual mortality rate—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).²³ Rates should be calculated for age and sex.

DATA RESOURCES Death certificate data from vital statistics agencies (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

PERIOD FOR CASE DEFINITION Calendar year based on date of death.

BACKGROUND Of the approximately 1.7 million people who sustained a TBI in the United States each year, an estimated 52,000 died; 275,000 were hospitalized; and 1.365 million were treated and released from an emergency department.³⁵

LIMITATIONS OF INDICATOR Injuries severe enough to result in death represent only a small proportion of the overall burden of injury. An evaluation of only these injuries may not present an accurate picture of the causes of less-severe injuries.

LIMITATIONS OF DATA RESOURCES The accuracy of indicators based on codes found in vital statistics data is limited by the completeness and quality of coding.

HEALTHY PEOPLE 2020 OBJECTIVES IVP-2.1: Reduce fatal traumatic brain injuries.

CALCULATING AND SUBMITTING RATES

Calculation Formula and Instructions

Preformatted rate calculation spreadsheets have been prepared for vital records-based indicators. These spreadsheets can be obtained from Karen Thomas at KEThomas@cdc.gov. Completion of the spreadsheet requires:

- Inserting state population data;
- Entering case counts for individual indicators; and
- Renaming the spreadsheets to reflect state and submission number.

The following rate calculation specifications have been preprogrammed into the spreadsheet. If you are preparing these data independent of the spreadsheet, please be sure to follow the same specifications.

- Use the estimated population for the year of the data. This information may be obtained from several sources:
 - <https://www.census.gov/data/tables/2016/demo/popest/state-detail.html> (preferred)
 - Under “Median Age by Age and Sex”
 - Select “Annual Estimates of the Resident Population by Single Year of Age and Sex: April 1, 2010 to July 1, 2016”
 - From the table, you can choose the state and download the data.
 - Your state’s demographic center
- Compute rates per 100,000 population.
- For each indicator report age-adjusted rates stratified by sex (female and male), and report the overall age-adjusted rate for the state.
- Report age-specific rates for each indicator in the following age categories:

Under 1	
1–4	45–54
5–14	55–64
15–24	65–74
25–34	75–84
35–44	85+

It is possible to obtain the anomalous looking overall age-adjusted rate which does not fall between the two gender-specific age-adjusted rates. Such outcomes are mathematically possible and should be included.

Calculate age-adjusted rates using the age-specific U.S. standard population weights from Table 1.

TABLE 1. AGE ADJUSTMENT TABLE: ALL AGES–ELEVEN AGE GROUPS

Age	U.S. 2000 Standard Population (1,000's)	Adjustment Weights
All ages	274,634	1.000000
Under 1	3,795	0.013818
1–4	15,192	0.055317
5–14	39,977	0.145565
15–24	38,077	0.138646
25–34	37,233	0.135573
35–44	44,659	0.162613
45–54	37,030	0.134834
55–64	23,961	0.087247
65–74	18,136	0.066037
75–84	12,315	0.044842
85+	4,259	0.015508

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