State Injury Indicators Report

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Foreword

CDC, CSTE and STIPDA are pleased to bring you the first *State Injury Indicators Surveillance Report*. The data inside—provided by 12 state health departments that voluntarily participated in a new surveillance effort—represent an important step toward routine surveillance and reporting of injury indicators in all states. The indicators were calculated by using state-level data from death certificates and hospital discharge records and data from several national surveillance systems. As more states join in this surveillance, we can present a broader picture of the burden of injuries and better identify priorities for prevention. We look forward to increased state participation in future reports.

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Introduction

Fifty-nine million injuries were reported in 1995, resulting in 37 million hospital emergency department visits and 2.6 million hospital discharges. Injuries also accounted for 37% of all hospital emergency department visits in 1995, and about 8% of all short-stay hospital discharges. Also that year, 147,891 people died from injuries: 61% of them from unintentional injuries, 21% from suicides, and 15% from homicides. Death from injury is the leading cause of years of potential life lost before age 75 in the U.S., largely because people ages 1 to 34 make up such a large portion of injuries.[1]

The mission of public health includes prevention, mitigation, and treatment assurance of injury, as well as the reduction of injury-related disability and death.[1] Its scope encompasses injuries involving any mechanism (e.g., firearm, motor vehicle, and burn) and includes both intentional and unintentional injuries. An important part of the public health mission is to emphasize that injuries are preventable and to dispel the widespread misconception that injuries are unavoidable.

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

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.[2] The 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); and the National Association of Injury Control Research Centers (NAICRC).

Consensus Recommendations identifies 14 specific injuries and injury risk factors to be placed under surveillance by all states and 11 datasets to be used to monitor these injuries and risk factors. The recommendations aim to improve state-based injury surveillance to better support injury prevention programs and policies. Enhancing and standardizing injury surveillance at the state level will also facilitate its integration with overall public health surveillance as part of the National Public Health Surveillance System (NPHSS), a conceptual framework for all public health surveillance activities.[3] In tandem with the *Consensus Recommendations*, CSTE and STIPDA developed injury indicators for inclusion in NPHSS; these indicators were formally adopted at CSTE's and STIPDA's annual meetings.[4, 5] The NPHSS injury indicators add to other indicators developed by CSTE for chronic diseases and other areas.[4]

At the annual STIPDA meeting in September 2000, NCIPC agreed to coordinate several state injury prevention programs in implementing surveillance based on the injury indicators. The twelve participating states were California, Colorado, Kentucky, Louisiana, Massachusetts, Michigan, Missouri, New Mexico, Oklahoma, Oregon, Texas, and Washington. This report presents 1997–98 surveillance data for these 12 states.

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 risk or protective factor, among a specified population.

Methods

Participating states reported on 11 of the 14 injuries and risk factors in *Consensus Recommendations*:

- motor vehicle injuries
- alcohol involvement in motor vehicle deaths
- self-reported seat belt and child safety seat use
- homicide
- suicide
- suicide attempts
- firearm injuries
- traumatic brain injuries
- fire and burn injuries
- self-reported smoke alarm use
- submersion injuries

For some of these conditions and risk factors, multiple sources of surveillance data are recommended; therefore, two or more surveillance indicators are used. For example, three indicators are related to fire and burn injuries: fatal fire-related injuries, hospitalizations for fire-related injuries, and smoke alarm prevalence. Thus, there are 20 indicators for the nine injuries and two risk factors recommended for surveillance.

Three conditions in *Consensus Recommendations* are not reported here: traumatic spinal cord injuries, fall injuries, and poisoning. For traumatic spinal cord injuries and fall injuries, surveillance case definitions and recommended data sources are not yet final. The case definition for poisoning was not established until 2000. Thus, no indicators related to poisonings were included in this report, which compiles 1997–98 data.

The states used a total of five datasets to report on the 20 indicators: the Fatality Analysis Reporting System, the state-based Youth Risk Behavior Survey, the Behavioral Risk Factor Surveillance System, state vital records, and state hospital discharge datasets.

comparisons must be interpreted cautiously as methods used to collect YRBS data may vary.[7]

Among the 12 states included in this report, four did not conduct a YRBS in 1997, and three had overall participation rates below 60%. CDC requires a minimum overall participation rate of 60% to generalize to a state's population. This report presents weighted data from five states.

Behavioral Risk Factor Surveillance System (BRFSS)

BRFSS is also managed by CDC's Chronic Disease Center. It is an ongoing, state-based, random-digit-dialed telephone survey of the U.S. civilian noninstitutionalized population over age 17. The BRFSS monitors risk behaviors associated with the leading causes of injury and death.[8]

Because BRFSS is telephone-based, population subgroups that are less likely to have telephones, such as persons of low socioeconomic status, may be under-represented. In addition, data are self-reported and potentially subject to reporting bias. For risk-reduction factors such as smoke alarms, seat belts, and child safety seats, self-reported use may not uniformly represent safe and effective use.[8]

State Vital Records

Death registration is the responsibility of individual states. The funeral director and the physician who certifies 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 basically the same in all states and is organized according to World Health Organization guidelines. Local registrars assure that all deaths in their jurisdictions are registered and that required information is on death certificates before sending them to the state registrar. State registrars number and file the death

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. To be included 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. NHTSA considers a fatal motor-vehicle crash to be alcohol-related if either a driver or non-occupant (e.g., pedestrian) had a blood alcohol concentration (BAC) greater than or equal to 0.01 g/dL.[6]

FARS does not include non-traffic crashes, such as those that occur on driveways and other private property. It also does not include deaths that occur more than 30 days after the motor vehicle crash. Because blood alcohol concentrations (BAC) are not available for all persons involved in fatal crashes, NHTSA's estimates for the number of alcohol-related traffic fatalities are based on a discriminant analysis of information from all cases for which driver or nonocccupant BAC data are available.[6]

Youth Risk Behavior Survey (YRBS)

YRBS is managed by the National Center for Chronic Disease Prevention and Health Promotion at CDC. It is a self-administered, school-based survey conducted biennially among ninth- through twelfth-grade students in many locations throughout the country. State and local departments of education and health conduct YRBS, and CDC analyzes the data. The YRBS monitors risk behaviors associated with the leading causes of injury and death among teenagers.[7]

YRBS data apply only to youth who attend school. In addition, the extent of underreporting or overreporting of behaviors cannot be determined, although the survey questions demonstrate good test-retest reliability. Interstate certificates, forwarding the certificates of nonresidents 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.[9]

Data are limited to what is reported on death certificates, and 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. Deaths associated with some injuries, especially suicide, may be underreported.

The number and type of cause-of-death fields to which states have access also vary. One of the states contributing to this report had access to a death certificate database that listed only the *underlying* cause of death. In contrast, the other 11 states each had access to a database that listed both *underlying* cause of death and *contributing* causes of death. States without access to multiple contributing cause-of-death fields cannot calculate fatality rates for traumatic brain injury (TBI) because the diagnostic codes that make up that case definition reside in the contributing cause-of-death fields.

Hospital Discharge Data (HDD)

More than half of all states maintain databases of hospital discharge records for all non-federal, acute care hospitals within their borders.[10] The information collected varies from state to state. Many states use the standard uniform billing form, UB-92, as the basis for their hospital discharge database. Some states use only a subset of variables from the UB-92 for their databases, while a few collect additional variables.

The UB-92, developed by the National Uniform Billing Committee, includes patient's age, sex and zip code; admission date; length of stay; total charges; principal diagnosis and up to eight additional diagnoses; and, for diagnoses resulting from injuries, external cause of injury (E code).

Methods *continued*

E codes, which are listed in the International Classification of Diseases-9 Clinical Modification (ICD-9 CM), describe several aspects of an injury: intentionality, mechanism, and, for unintentional causes of injury, location of occurrence.[10]

Although HDD have been collected in some states for many years, their use for public health surveillance has been limited. The HDD indicators for injury are based on a case definition that is being used for the first time by multiple states to report comparable information about injury hospitalizations. Thus, the strengths and limitations of the case definition and of the data are not yet well characterized. Several caveats should be noted:

- The data are generated from forms used to bill for hospital services. Quality assurance practices for these data vary from state to state.
- Not all states mandate that hospitals report HDD. Even in those that do, hospital participation rates vary, as do requirements for the data elements to be reported, including the reporting of external cause codes. It is difficult to determine the hospital participation rate in HDD collection because the total number of hospitals changes often, as they merge or close and new ones open.
- Wide variation exists among the states in this report in the percentage of coding for external cause of injury (E coding) for injury-related diagnoses, ranging from 54% to 100%.
- A patient might be counted more than once for one event, as with intra-hospital transfers between services. While many states have

injuries and falls. Future reports may also include more detailed descriptions of the surveillance data to identify populations at risk.

The data contained in this report are readily available in many states through national surveillance systems such as FARS, or through analysis of state data sets, such as death certificates or HDD. In fact, CDC estimates that existing data systems in more than half of all states would allow them to calculate the injury indicators in this report. Therefore, we expect more states to participate in the next report, and the proportion of states represented in subsequent reports should increase as state injury surveillance systems become more comprehensive.

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developed probability algorithms to eliminate such duplications, these algorithms differ, limiting comparability. Therefore, states contributing to this report were asked to leave suspected duplicates in the dataset for this analysis. So, the rates displayed in this report reflect numbers of hospitalizations, rather than numbers of people hospitalized. The exceptions to this are California and Michigan, whose HDD are generated in such a way that duplicate admissions were not available for inclusion in analysis.

- Unlike the system for death certificates, no standard system exists to forward hospitalization data on nonresidents to their states of residence. This is a particular problem when trauma centers or other referral centers are located on or near state borders; injured residents may be hospitalized in the neighboring state without any record of their hospitalizations entering the HDD of their state of residence.

To remind readers of the limitations of HDD, each display of indicators calculated from HDD is accompanied by a table containing some of the quality issues affecting participating states' HDD.

Future Efforts

This report is intended to be the first in a series of reports about state-based injury surveillance. While this report includes only 11 of the 14 injuries and injury risk factors recommended for surveillance in *Consensus Recommendations*, future reports should include all 14 once case definitions have been developed for surveillance of traumatic spinal cord

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Hospitalizations—All Injuries

Surveillance of injuries resulting in hospitalization provides important perspective on the public health burden of injury morbidity. National surveillance for hospitalizations is based on analysis of the National Hospital Discharge Survey, a national probability sample of hospital inpatient records.[1] In 1995, injuries resulted in 2.6 million hospital discharges.[2]

Injury hospitalization rates for males and females are similar for all ages combined, but differ considerably within certain age groups. For ages 15 to 24 years, the injury hospitalization rate for males is about twice that for females, whereas for ages 75 years or older, the rate for females is about 1.4 times that for males.[2]

The hospitalization rate for black males under age 65 years is about twice the rate for white males. The rates for white and black males are similar for ages 65 years and over. Among females, the hospitalization rate for black children is about twice the rate for white children; this difference narrows with increasing age. For women ages 65 years and older, the injury hospitalization rate for whites is about 1.4 times the rate for blacks.[2]

The rates shown here represent hospitalizations for which the principal diagnosis was an injury, including late effects, but excluding adverse effects of therapeutic use of drugs and adverse effects of medical/surgical care. (Injuries are defined by the inclusion criteria displayed in Appendix B.) As the inclusion criteria are based on nature of injury codes only, the percentage of external cause coding (E coding) in a state's hospital discharge data (HDD) does not affect this rate. Completeness of reporting, cross-border hospitalizations, and duplication of records affect state rates for HDD-based indicators whether external cause codes or nature of injury codes are used. Because these factors vary among states, Table 1 is provided to assist in interpreting HDD-based indicators. This table shows qualitative evaluations of completeness of reporting, cross-border hospitalizations, duplication of records, and quantitative evaluation of percentage of external cause coding. Two other factors should be considered when interpreting HDD-based indicators. First, rates represent hospitalizations, not patients, per 100,000 population since most HDD sets are not unduplicated. Second, hospitalization rates displayed in this report include deaths that occurred during a hospitalization for injury, causing a small overlap with fatal indicators based on death certificates.

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All Injury Hospitalization Rate

Figure 1.
All Injury Hospitalization Rate, 1997 and 1998

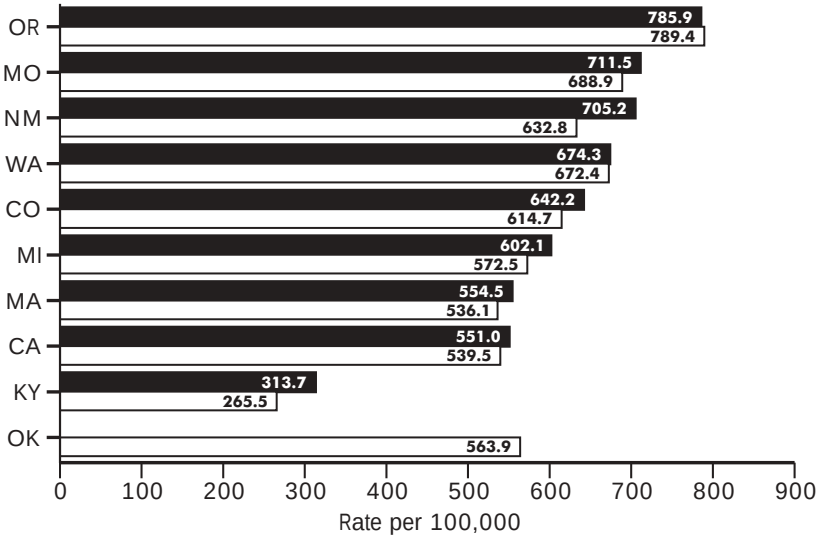

Figure 2.
Percentage of Hospital Discharge Data Injury Records with External Cause Coding, 1997 and 1998

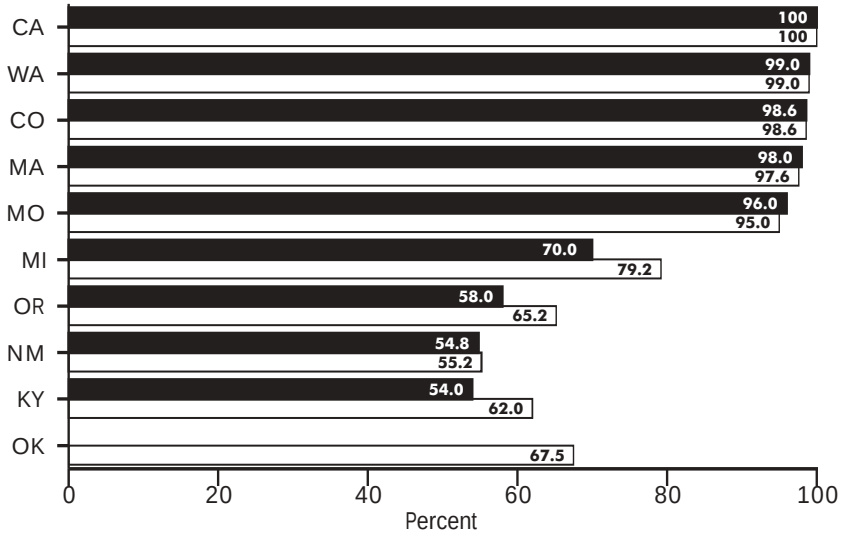

Table 1.
Factors Affecting Representativeness of State Hospital Discharge Data Sets for Injury Surveillance, 1997 and 1998

	Percentage of Injury Hospitalizations with External Cause Coding		Duplicate Records Removed for this Analysis	Cross-border Hospitalization*	Incomplete Hospital Participation
	1997	1998	1997 & 1998	1997 & 1998	1997 & 1998
CA	100.0	100.0	Yes	No	No
CO	98.6	98.6	No	No	No
KY	54.0	62.0	No	Yes	Yes
MA	98.0	97.6	No	No	No
MI	70.0	79.2	Yes	Yes	No
MO	96.0	95.0	No	No	No
NM	54.8	55.2	No	Yes	No
OK	n/a	67.5	No	Yes	No
OR	58.0	65.2	No	No	No
WA	99.0	99.0	No	No	No

*Subjective assessment by health department staff that a substantial proportion of state residents injured in-state who require hospitalization are hospitalized in a neighboring state.

KEY: 1997 ■ 1998 □

Traumatic Brain Injuries (TBI)

Of all types of injury, brain injuries are among the most likely to cause death or permanent disability.[1] Each year in the United States, an estimated one million people are treated for TBI and released from hospital emergency departments;[2] 230,000 people are hospitalized for TBI and survive,[3] and 50,000 people die.[4] An estimated 5.3 million Americans live with a TBI-related disability.[5]

The risk of TBI is highest among adolescents, young adults, and people ages 75 years and older. The leading causes of TBI are motor vehicle crashes, violence, and falls. Falls are the leading cause of TBI among persons ages 65 years and older, and motor vehicle crashes are the leading cause among persons ages 5 to 64 years. For persons of all ages, the risk of TBI is twice as high among males as females. The outcome of these injuries varies greatly depending on the cause: 91% of firearm-related TBIs result in death, and 11% of fall-related TBIs are fatal.[6]

Nearly two-thirds of firearm-related TBIs are classified as suicidal in intent.[5] Firearms surpassed motor vehicle crashes as the largest single cause of death associated with traumatic brain injury in the United States in 1990.[7] These data reflect the success of efforts to prevent traumatic brain injury due to motor vehicle crashes and failure to prevent such injuries due to firearms.[1] Continued surveillance of TBI is needed to monitor trends, identify high-risk groups, prioritize prevention efforts, and assess prevention programs.

Figure 3 presents the fatal TBI rates in 11 states in 1997 and 1998. It illustrates a more than three-fold difference between the lowest and highest rates. Figure 4 presents TBI-related hospitalization rates in the nine states where data were available; as noted previously, cases of injury resulting in hospitalization and subsequent death may be included in both HDD and death certificate data.

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Traumatic Brain Injury Indicators

Figure 3.
Fatal Traumatic Brain Injury Rate, 1997 and 1998

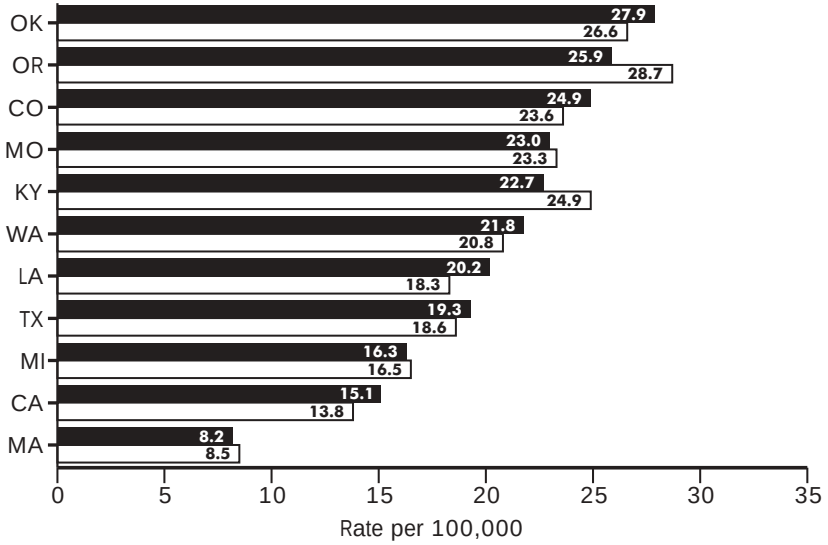
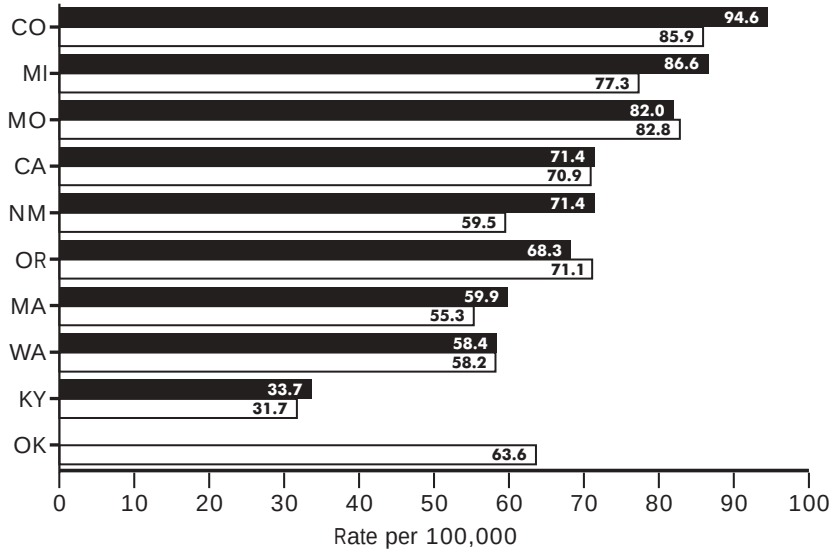


Figure 4.
Traumatic Brain Injury-related Hospitalization Rate, 1997 and 1998*



*Percentage of injury hospitalizations with external cause coding does not affect this rate because the case definition is based on nature of injury coding.

Table 1.
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	1997	1998	1997 & 1998	1997 & 1998	1997 & 1998
CA	100.0	100.0	Yes	No	No
CO	98.6	98.6	No	No	No
KY	54.0	62.0	No	Yes	Yes
MA	98.0	97.6	No	No	No
MI	70.0	79.2	Yes	Yes	No
MO	96.0	95.0	No	No	No
NM	54.8	55.2	No	Yes	No
OK	n/a	67.5	No	Yes	No
OR	58.0	65.2	No	No	No
WA	99.0	99.0	No	No	No

*Subjective assessment by health department staff that a substantial proportion of state residents injured in-state who require hospitalization are hospitalized in a neighboring state.

KEY: 1997 ■ 1998 □

Motor Vehicle Crashes

In 1998, motor vehicle crashes (MVCs) caused more than 43,000 deaths and 4.2 million emergency department visits.[1, 2] Among persons ages 1 to 34, MVC injuries are the leading cause of death in the United States.[1] In all age groups, motor vehicle crashes are the leading cause of deaths from unintentional injuries; they are also the leading cause of years of potential life lost (YPLL).

Failure to use a safety belt or child restraint represents a major risk factor for fatalities and injuries to motor vehicle occupants. Among front seat occupants, safety belt use reduces the risk for fatal injury by an estimated 45% and the risk for moderate to critical injury by 45% to 50%. Use of child safety seats reduces the likelihood of fatal injury by an estimated 69% for infants and 47% for toddlers.

Alcohol-impaired driving poses a high risk for deaths and is a major public health concern in the United States. In 1998, 38% of traffic fatalities were alcohol-related; either the driver or an affected person (e.g., a pedestrian or a bicyclist) had a blood alcohol concentration of at least 0.01 gram per deciliter (g/dL).[3] Each year, more than 120 million episodes of alcohol-impaired driving occur among adults in the United States; nearly 10 million of these episodes involve underage youth 18 to 20 years of age. About 1.4 million arrests are made each year for impaired driving. Effective strategies for preventing alcohol-related traffic fatalities and injuries include laws to lower the legal levels of blood alcohol concentration to 0.08 g/dL and restrict underage drinking, enforcement of sobriety check points, and increased public awareness.[4, 5]

Figures 5 and 6 display data from 12 states on all MVC fatalities and traffic-related MVC fatalities in 1997 and 1998. In every state, the large majority of MVC fatalities are traffic-related (i.e, occur on public roads). Figures 8 and 9 present data on self-reported safety belt use among adults (BRFSS) and among high school students (YRBS) in 1997. Sixty percent or more of adults in all 12 states reported using safety belts; however, in all but one of the five states with weighted YRBS data, fewer than 40% of high school students reported using safety belts. Figure 12 displays crude rates for alcohol involved MVC deaths based on FARS data.

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Motor Vehicle Crash (MVC) Indicators

Figure 5.
Fatal Motor Vehicle Crash Rate: Traffic and Nontraffic, 1997 and 1998

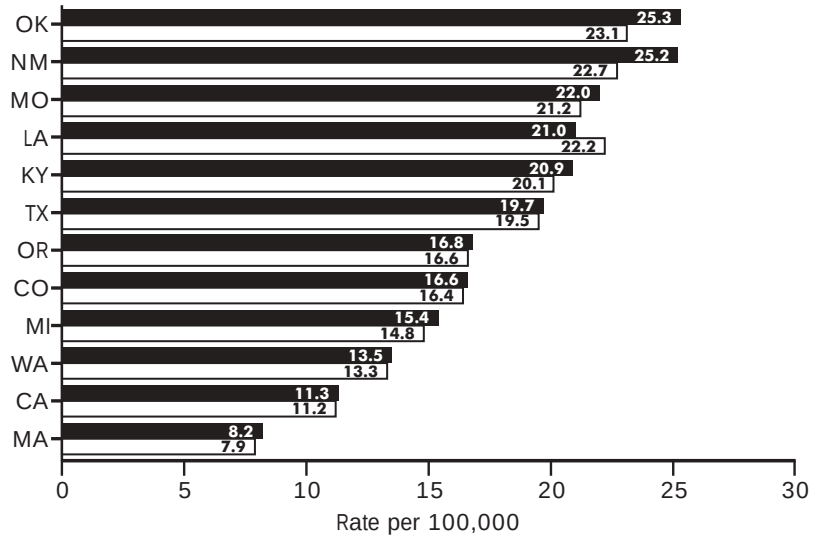


Figure 6.
Fatal Motor Vehicle Crash Rate: Traffic, 1997 and 1998

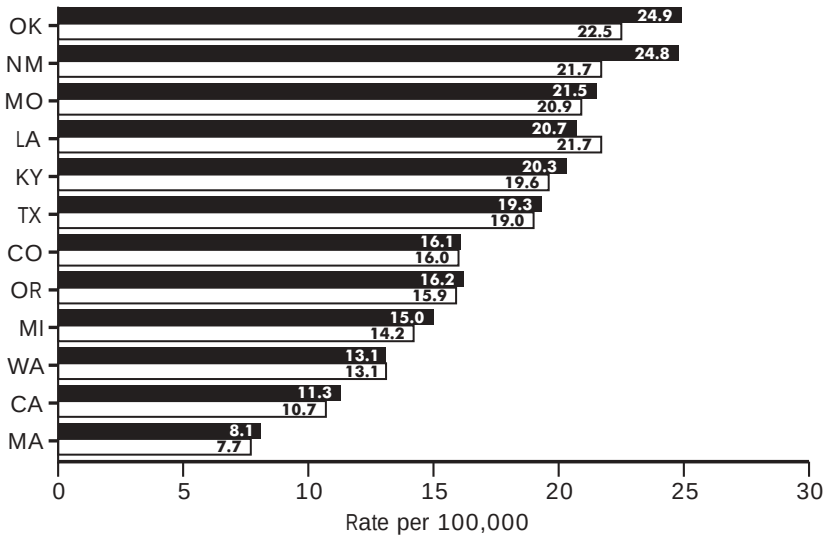
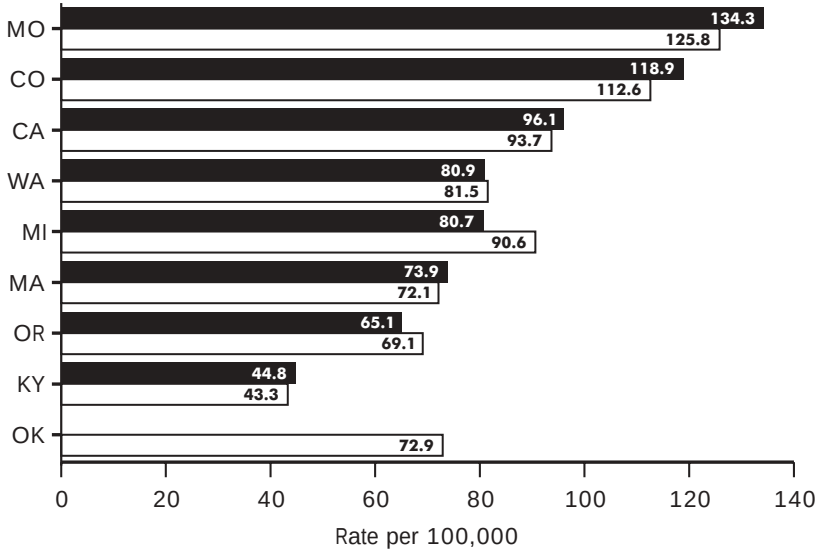


Figure 7.
Motor Vehicle Crash-related Hospitalization Rate: Traffic and Nontraffic
1997 and 1998



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	1997	1998	1997 & 1998	1997 & 1998	1997 & 1998
CA	100.0	100.0	Yes	No	No
CO	98.6	98.6	No	No	No
KY	54.0	62.0	No	Yes	Yes
MA	98.0	97.6	No	No	No
MI	70.0	79.2	Yes	Yes	No
MO	96.0	95.0	No	No	No
NM	54.8	55.2	No	Yes	No
OK	n/a	67.5	No	Yes	No
OR	58.0	65.2	No	No	No
WA	99.0	99.0	No	No	No

*Subjective assessment by health department staff that a substantial proportion of state residents injured in-state who require hospitalization are hospitalized in a neighboring state.

KEY: 1997 ■ 1998 □

Self-reported Motor Vehicle Crash Risk Behavior Indicators

Figure 8.
Adults Using Safety Belts, 1997

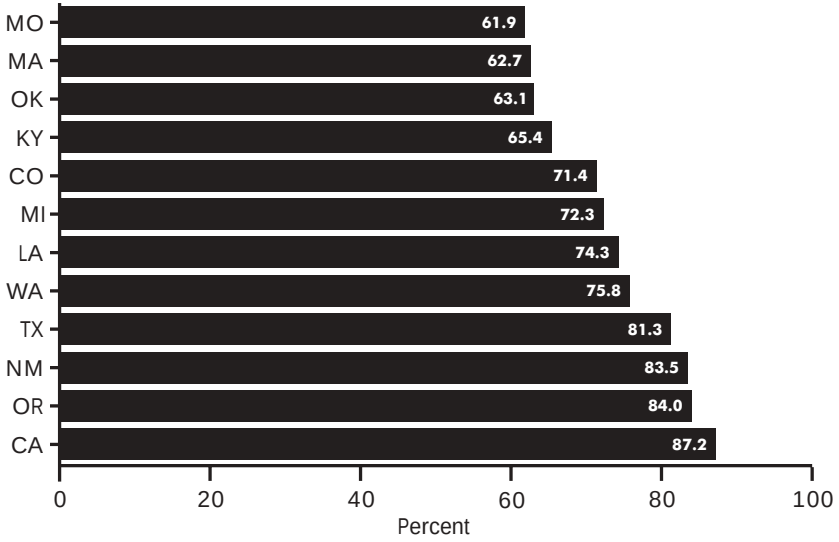


Figure 9.
High School Students Using Safety Belts, 1997

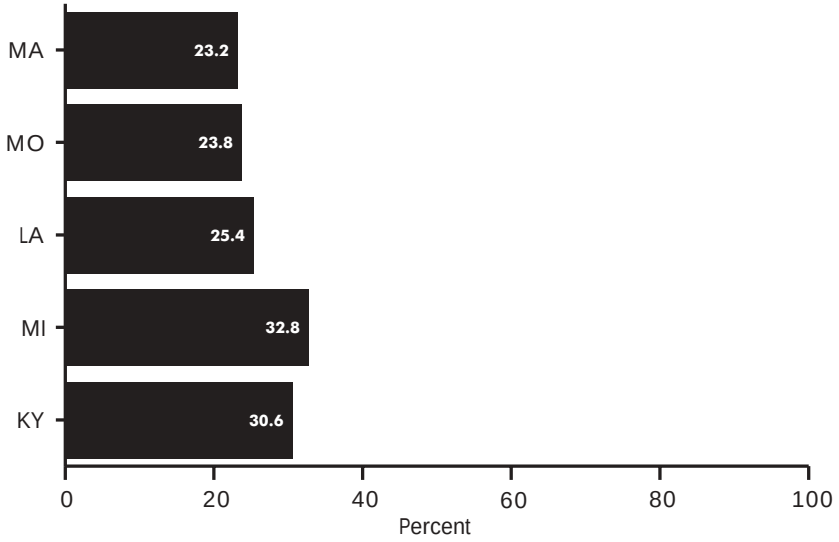


Figure 10.
Parents Always Using Child Restraints, 1997

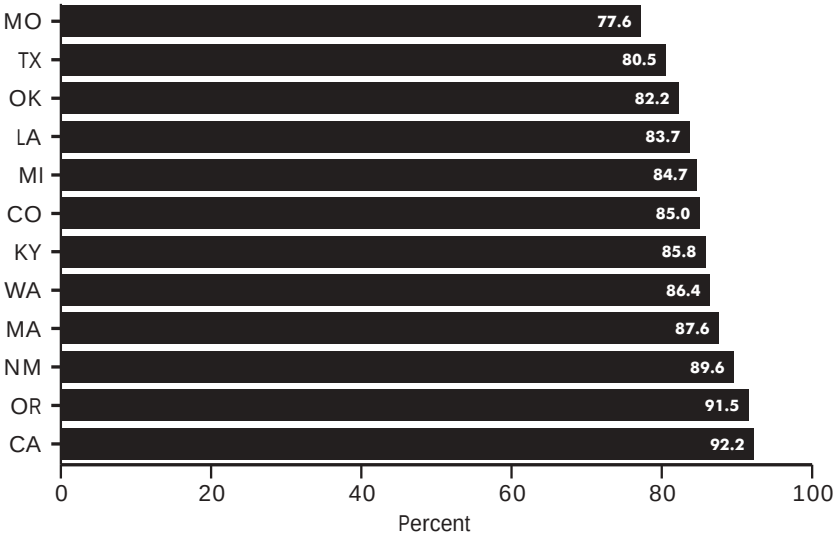
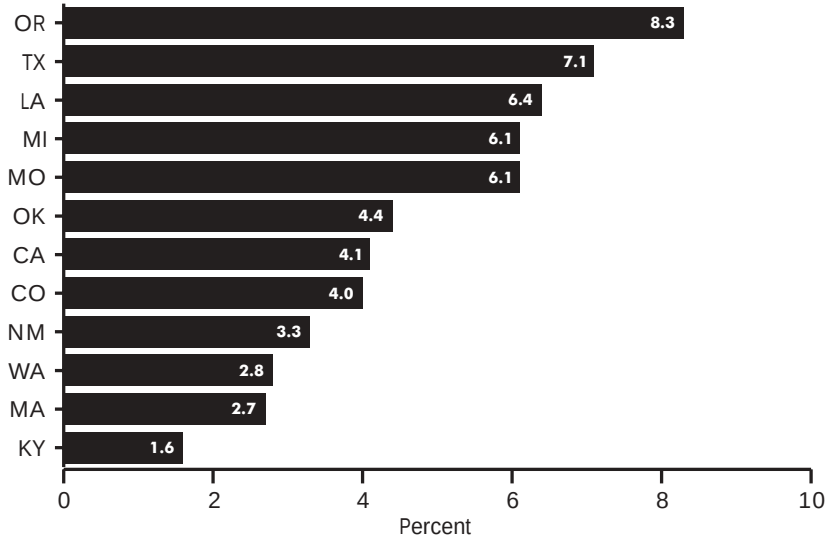
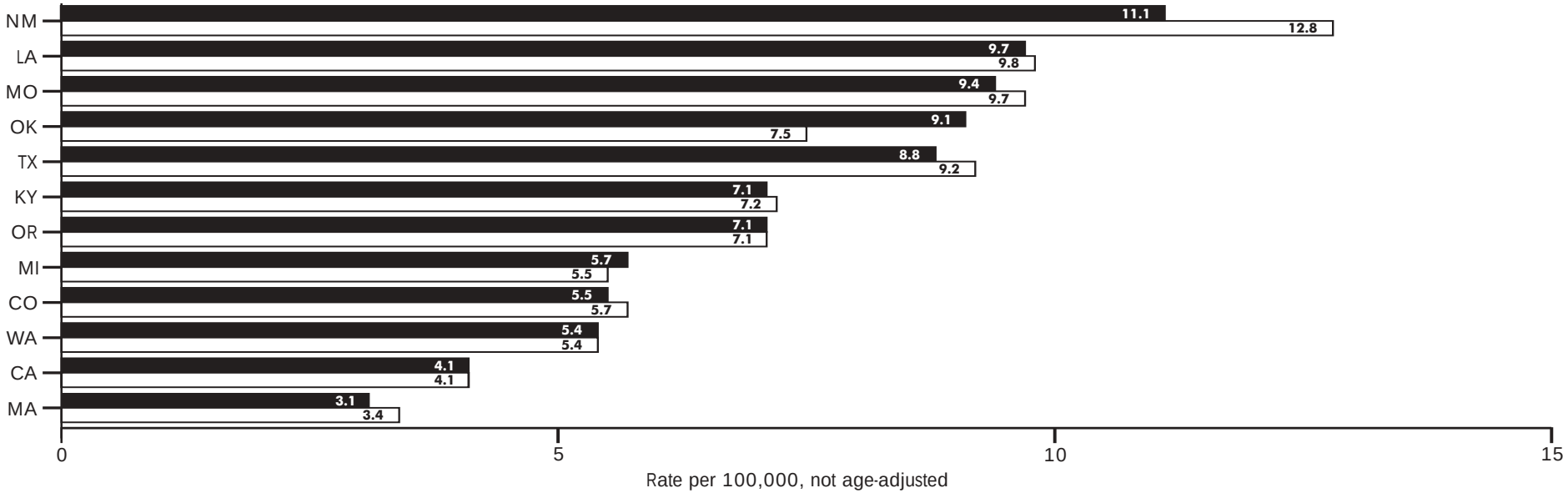


Figure 11.
Adults Driving After Drinking Too Much in the Last 30 days, 1997



Motor Vehicle Crash (MVC) Indicator

Figure 12.
Alcohol-involved Motor Vehicle Crash Deaths, 1997 and 1998



KEY: 1997 1998

Drowning

Drowning is the second leading cause of injury death in the United States among children ages 1 to 14 years. It also ranks among the top 10 causes of unintentional injury death for all ages combined. In 1998, 5,096 drownings occurred in the U.S., the majority of which were unintentional (86.4% unintentional; 8.7% intentional; 4.9% undetermined).[1] Men are at higher risk than women (4:1), and blacks are at higher risk than whites (1.6:1).

Drowning rates are highest for two age groups: children under five years of age, and persons 15 to 24 years of age. For every child who drowns, another four are hospitalized and 16 receive emergency department care for near-drowning.[2] Near-drowning can be costly and result in lifelong disability.

Among adolescents and adults, risk factors for drowning include drinking alcohol, swimming alone and not wearing personal flotation devices while engaged in water sports or recreation. For children under five, unexpected access to water or brief lapses in adult supervision while in the water are implicated in most drownings.[3]

Most toddlers and pre-schoolers drown in residential backyard pools, while most infants drown in bathtubs or other small water containers such as buckets and toilets. The percentage of drownings in open water such as lakes, rivers, and the ocean increases with age.

Despite technological advancements in medical care, hospital treatment often does little to change the outcome of a submersion injury. Since the window of opportunity to prevent brain damage or death is so small, prevention is key.

Strategies to prevent drownings among infants and children focus on proper fencing of home pools, increasing risk awareness among caregivers, and educating caregivers about appropriate supervision in aquatic settings. Strategies to prevent drownings among teenagers and adults may focus on increasing swimming skills and knowledge of water safety, using personal floatation devices, and avoiding alcohol during water activities.

Data from the 12 reporting states reflect national statistics that show the majority of drownings are unintentional. However, these state data show a much higher ratio of drownings to near-drowning hospitalizations than did a national study conducted in 1990 (discussed previously).[2] The ratio of drownings to hospitalizations for near-drowning ranges from a low of 1:1.1 to a high of 1.7:0.2. This may be due in part to limitations of hospitalization data, especially incomplete reporting. It also may reflect a change in health care delivery or a change in the severity of submersion incidents since 1990. Additionally, the 1990 study looked only at children, while these indicators are calculated for the states' entire populations.

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Drowning Indicators

Figure 13.
Drowning Rate: All Intents, 1997 and 1998

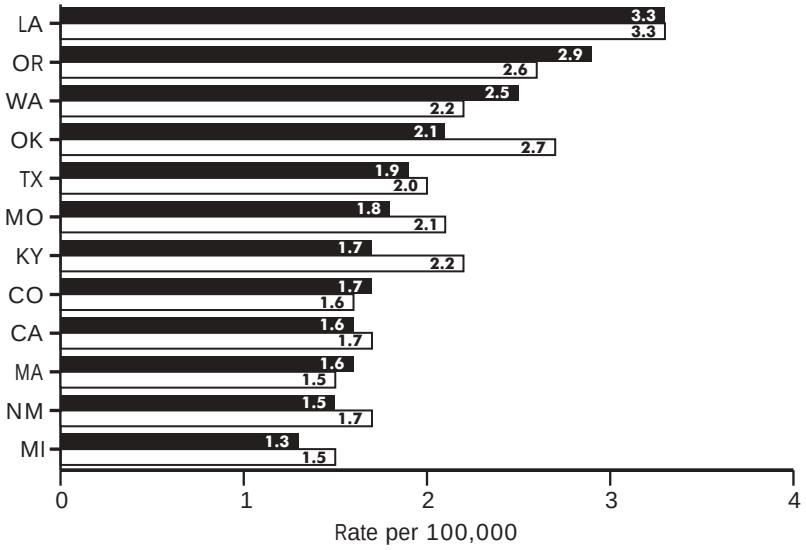

Figure 14.
Drowning Rate: Unintentional, 1997 and 1998

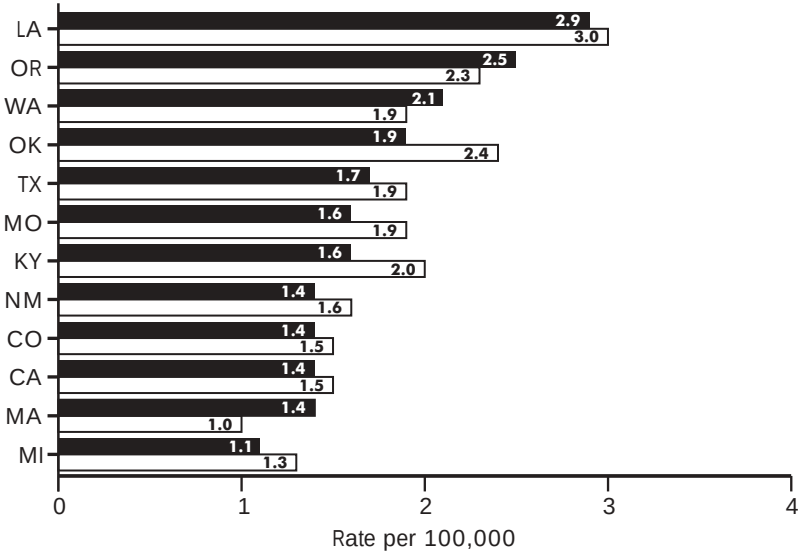

Figure 15.
Near-drowning Hospitalization Rate: All Intents, 1997 and 1998

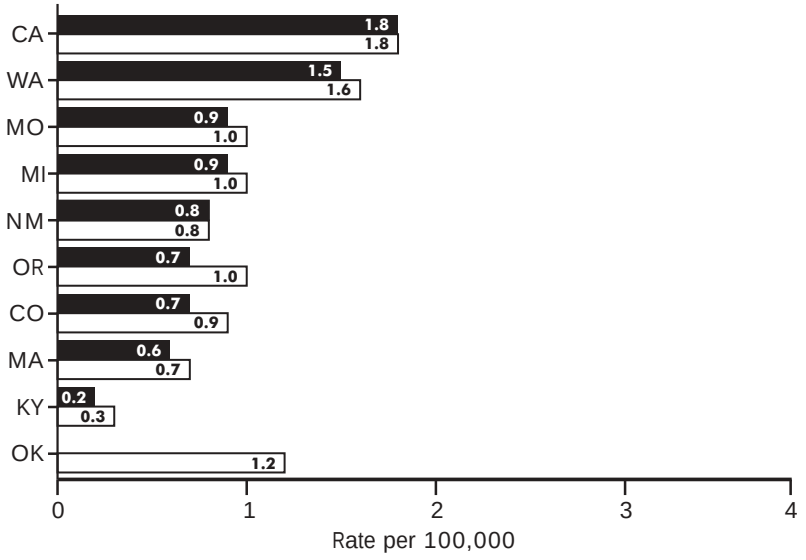

Table 1.
Factors Affecting Representativeness of State Hospital Discharge Data Sets for Injury Surveillance, 1997 and 1998

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KY	54.0	62.0	No	Yes	Yes
MA	98.0	97.6	No	No	No
MI	70.0	79.2	Yes	Yes	No
MO	96.0	95.0	No	No	No
NM	54.8	55.2	No	Yes	No
OK	n/a	67.5	No	Yes	No
OR	58.0	65.2	No	No	No
WA	99.0	99.0	No	No	No

*Subjective assessment by health department staff that a substantial proportion of state residents injured in-state who require hospitalization are hospitalized in a neighboring state.

KEY: 1997 ■ 1998 □

Fire-related Injuries and Deaths

The United States has the third highest overall fire death rate of all industrialized countries.[1] Residential fires cause about 80% of all civilian fire-related deaths.[2] In 1997, 406,500 residential fires in the United States claimed the lives of 3,360 people and injured another 17,775.[3] Cooking is the leading cause of home fires, while smoking materials are the leading cause of home-fire deaths.[2]

Residential fires disproportionately affect young children, older adults, blacks, and Native Americans. The southern United States has the highest regional fire death rate. Contributing factors may include rural poverty, a lower prevalence of smoke alarms, and a greater use of portable heating equipment.[4]

Working smoke alarms reduce the chance of dying in a house fire by 40% to 50%.[5] However, about 20% of U.S. households lack working smoke alarms.[6] One large-scale smoke alarm giveaway program reduced the incidence of fire-related injury rates by 80% in its target area.[4]

Figure 16 presents fire-related death rates for 12 states in 1997 and 1998 (a stable rate could not be calculated for New Mexico in 1997 because the number of fire-related deaths was so small that year). This figure shows an approximately three-fold difference between the lowest and highest rates. Figure 17 presents the self-reported prevalence of smoke alarms for 12 states in 1997. All states had a smoke alarm prevalence of at least 87%. Figure 18 presents the fire-related hospitalization rates for eight states in 1997 and nine states in 1998. This figure illustrates a difference between the lowest and highest hospitalization rates similar to that seen in deaths.

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5. Ahrens M. U.S. Experience with Smoke Alarms and Other Fire Alarms. Quincy (MA): National Fire Protection Association; 2000.

6. Smith CL. Smoke Detector Operability Survey—Report on Findings. Bethesda (MD): U.S. Consumer Product Safety Commission; 1993.

Fire-related Injury Indicators

Figure 16.
Fire-related Fatality Rate, 1997 and 1998

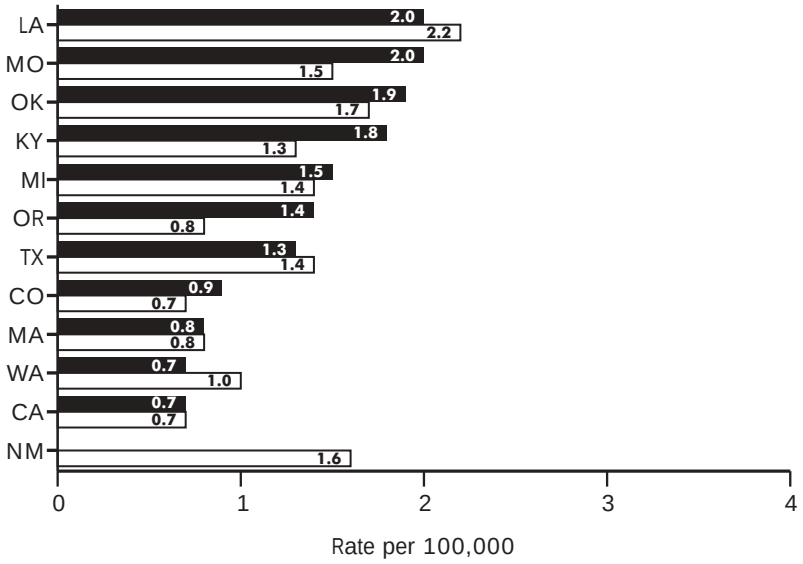


Figure 17.
Smoke Alarm Prevalence, 1997

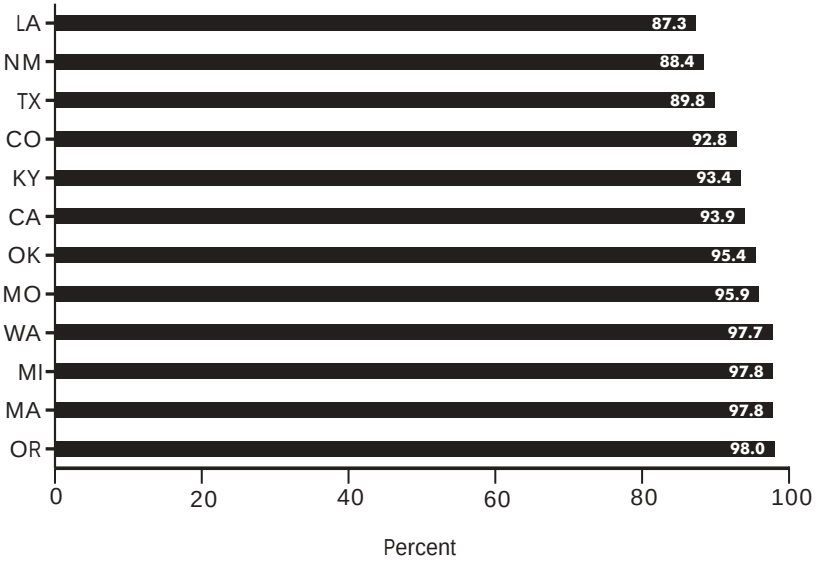
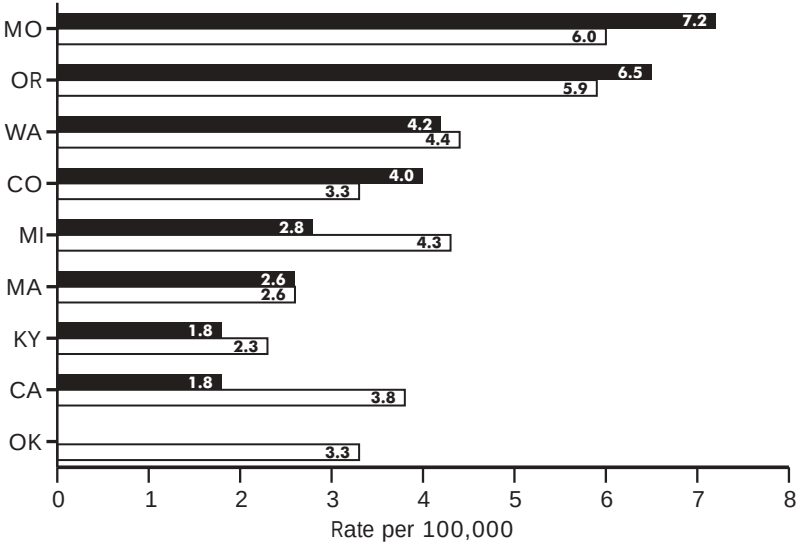


Figure 18.
Fire-related Hospitalization Rate, 1997 and 1998



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MI	70.0	79.2	Yes	Yes	No
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OK	n/a	67.5	No	Yes	No
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WA	99.0	99.0	No	No	No

*Subjective assessment by health department staff that a substantial proportion of state residents injured in-state who require hospitalization are hospitalized in a neighboring state.

KEY: 1997 ■ 1998 □

Firearm-related Injuries

Firearm-related injuries are the second leading cause of injury-related death in the United States, accounting for approximately 31,000 deaths in 1998.[1]

Both fatal and nonfatal firearm-related injury rates are highest among persons ages 15 to 24 years; black males in this age group have the highest risk. Fatal and nonfatal firearm-related injury rates for Hispanics are generally less than those for blacks, but higher than those for white non-Hispanics. The firearm-related death rate for males is six times higher than that for females; the nonfatal firearm-related injury rate for males is eight times higher. The proportion of persons who die from firearm-related injuries increases with age. Of those who survive a gunshot wound and are treated in a hospital emergency department (ED), approximately 55% are hospitalized or transferred; the other 45% are treated and released. Nationally, the case-fatality rate and hospitalization rate are higher for firearm-related injuries than for any other cause of injury.[1]

The majority of fatal and nonfatal firearm-related injuries among teenagers and young adults results from interpersonal violence. In contrast, firearm-related injuries among older adults are predominantly self-inflicted. Although unintentional firearm-related deaths represent less than 4% of all firearm deaths, approximately one-fifth of nonfatal firearm-related injuries treated in U.S. EDs are unintentional.[1]

In 1994, treatment of gunshot injuries in the United States cost an estimated $2.3 billion in lifetime medical costs, $1.1 billion of which was paid by the federal government.[2]

Nationally, fatal firearm-related injury rates declined 29%, and nonfatal firearm-related injury rates declined 47% during 1993–1998.[1] Although the reasons for these changes are unknown, certain factors may have contributed to the decrease in both fatal and nonfatal firearm-related injury rates. For example, the decline in assault firearm injuries is consistent with a 27% decrease in violent crime during the same period.[3] Possible contributors include improvements in economic conditions; aging of the population; decline of the cocaine market; changes in legislation, sentencing guidelines, and law-enforcement practices; and improvements associated with violence prevention programs.[4] However, the importance and relative contribution of each of these factors have not been determined.

Figure 19 presents firearm-related death rates in 12 states in 1997 and 1998, and it illustrates a more than five-fold difference between the lowest and highest rates. Figure 20 presents firearm-related hospitalization rates in eight states for 1997 and nine states for 1998. There is an approximately four-fold difference between the lowest and highest rates for hospitalization.

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Firearm-related Indicators

Figure 19.
Fatal Firearm Rate, 1997 and 1998

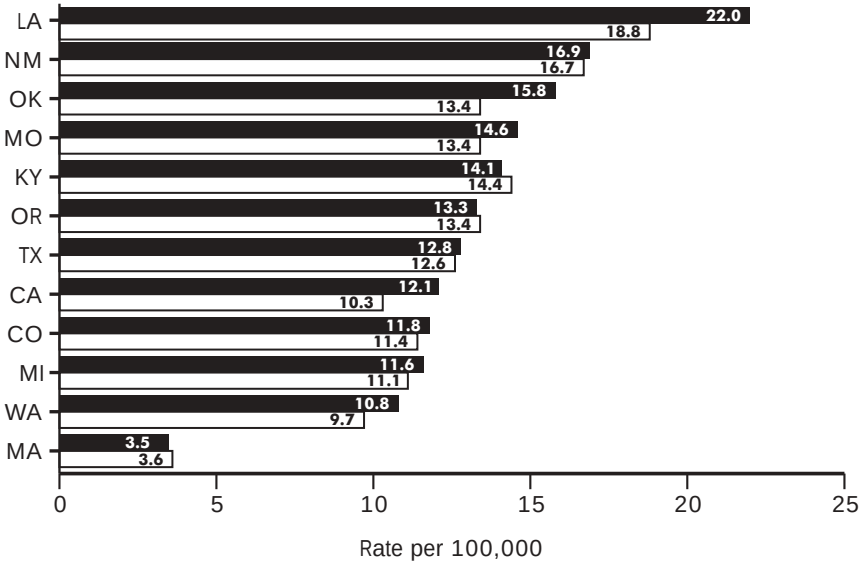
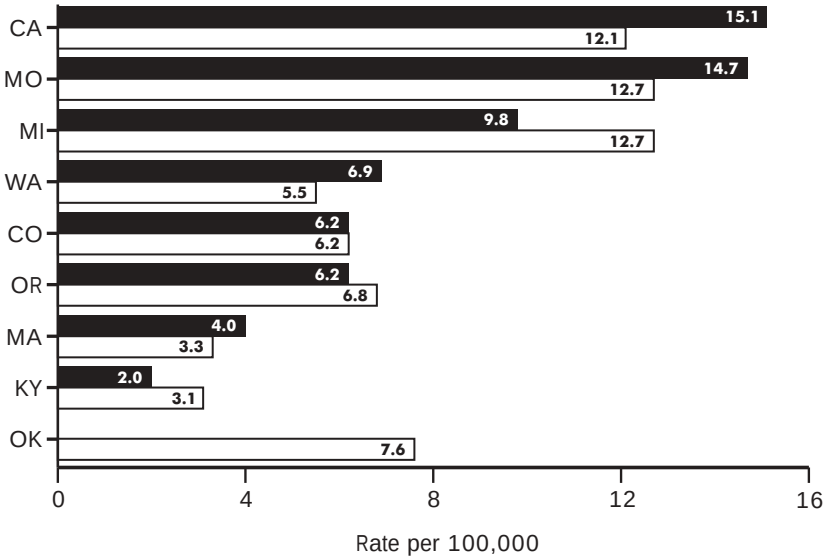


Figure 20.
Firearm Hospitalization Rate, 1997 and 1998



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*Subjective assessment by health department staff that a substantial proportion of state residents injured in-state who require hospitalization are hospitalized in a neighboring state.

KEY: 1997 ■ 1998 □

Homicide

Homicide is the thirteenth leading cause of death overall in the United States, and it is the second most common cause of death among persons ages 15 to 24. In 1998, 17,893 people were killed in homicides. Firearms were used in 66% of these homicides. The next most commonly reported mechanism was cutting and stabbing with sharp instruments, such as knives (12%).[1]

Males are three times more likely than females to die from homicide. Black males ages 20 to 24 have the highest homicide rates of any group in the United States—124.4 per 100,000 in 1998.[1] Among all age groups combined, homicide rates are lowest for Asian Americans, with whites having only slightly higher rates. Rates for Native Americans are 2.6 times higher than for Asian Americans, and rates for blacks are highest—6.5 times higher than those for Asian Americans.[1]

Homicide rates are higher in the southern United States, and rates in metropolitan areas are higher than elsewhere. Homicide is associated with high urbanization and socioeconomic deprivation.[2] These factors are thought to underlie the observed variation in risk by race.

Strategies for preventing homicide and violence require integrating approaches from multiple disciplines, including criminal justice, education, social services, community advocacy, and public health. Public health approaches have focused on changing individual attitudes and behaviors by enhancing knowledge and skills, changing the social and physical environments, and increasing community awareness of the causes and prevention of violence.[3]

Figure 21 presents the homicide rates for 12 states in 1997 and 1998, and illustrates a more than six-fold difference between the lowest and highest rates.

References

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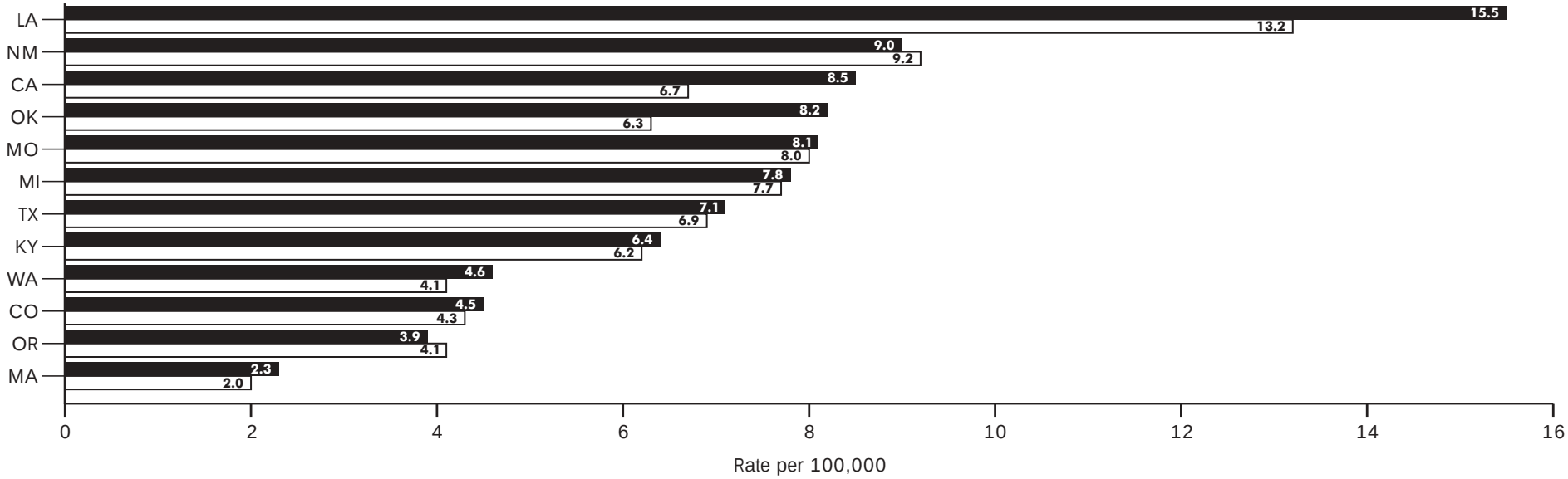
Homicide

Figure 21.
Homicide Rate, 1997 and 1998



KEY: 1997 ■ 1998 □

Suicide and Suicide Attempts

Suicide claims the lives of approximately 30,000 Americans each year.[1] In 1998, suicide was the eighth leading cause of death overall in the U.S., and the third leading cause of death for adolescents and young adults ages 15 to 24 years.[2] Although the suicide rate among adolescents and young adults nearly tripled between 1952 and 1994, suicide rates have consistently been the highest among persons ages 65 and older.[1] Overall, males are four times more likely than females to die from suicide.[1] In addition to the human toll of suicide, the economic costs are enormous. One study estimated that suicide cost the U.S. $111.3 billion in 1995.[3]

Completed suicides are not the only public health concern. Suicidal ideation, planning, and attempts also have major public health impact. In the U.S. in 1998, there were an estimated 671,000 hospital emergency department visits for suicide attempts.[4] Because one of the strongest risk factors for suicide is a previous attempt, surveillance of suicide attempts can help identify high-risk groups and target prevention strategies.[5] Important differences exist for suicide ideation and behavior. For example, while the suicide rate is higher for males than females, the rates of suicidal thoughts and suicide attempts is higher for females.[5]

Promising programs in suicide prevention address multiple risk factors.[6] Such programs have brought together many different groups within a community; focused on early intervention; and worked to strengthen protective factors such as effective coping skills, a sense of belonging and caring, and policies that promote help-seeking behavior. In two very different settings and populations, the U.S. Air Force and a Western Athabaskan tribe in rural New Mexico, such programs resulted in substantial reductions in suicide rates in the targeted populations.[7, 8]

Figure 22 shows suicide rates from 12 states in 1997 and 1998. It illustrates a more than two-fold difference between the lowest and highest rates. Figure 23 presents YRBS data on self-reported suicide attempts among high school students in five states. Figure 24 displays suicide attempt hospitalization rates in nine states where data were available.

References

1. Moscicki E. Identification of suicide risk factors using epidemiologic studies. The Psychiatric Clinics of North America 1997;20:499-517.

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8. CDC. Suicide prevention evaluation in a Western Athabaskan American Indian tribe–New Mexico, 1988–1997. MMWR 1998; 47:257-261.

Suicide Indicators

Figure 22.
Suicide Rate, 1997 and 1998

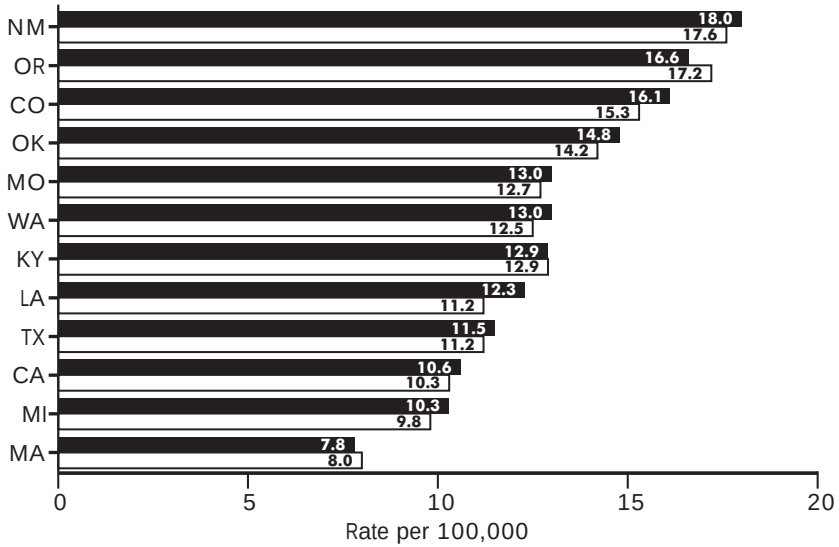


Figure 23.
High School Students Reporting Suicide Attempt, 1997

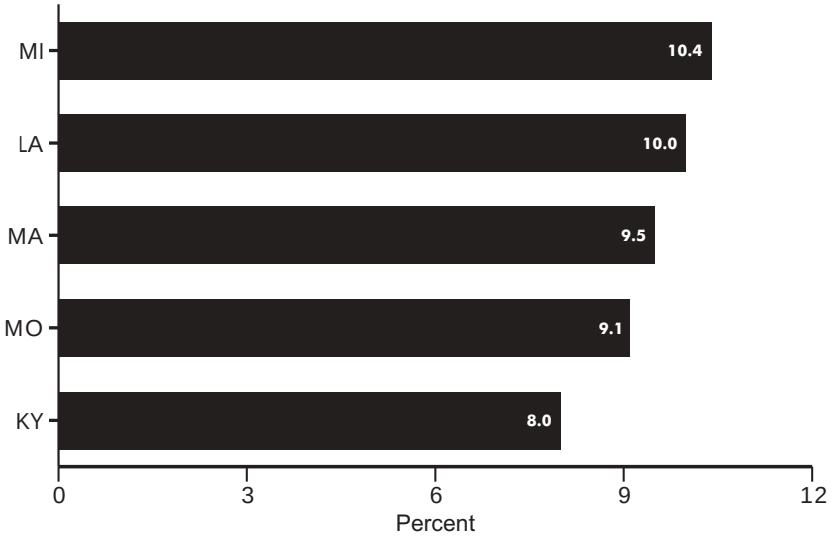
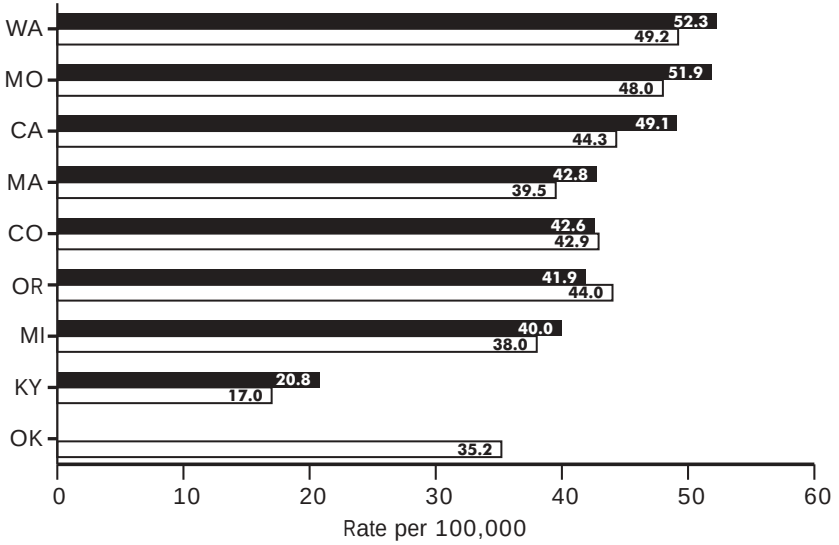


Figure 24.
Suicide Attempt Hospitalization Rate, 1997 and 1998



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*Subjective assessment by health department staff that a substantial proportion of state residents injured in-state who require hospitalization are hospitalized in a neighboring state.

KEY: 1997 ■ 1998 □

Appendix A

Members of the ad hoc Hospital Discharge Data Working Group

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Appendix B

Instructions for Calculating National Public Health Surveillance System Injury Indicators

The following are the instructions used by contributing state injury programs to arrive at the indicators displayed in this report.

Computation of Rates

Rates should be computed per 100,000 population. The estimated population for the year of the data should be used. That estimate should be obtained from your state's demographic center or from: www.census.gov/population/www/estimates/statepop.html.

Round rates to one decimal place (e.g., 9.31 would round to 9.3, and 8.96 to 9.0).

Source: Death Certificates

Mortality indicators should be age-adjusted to the 2000 standard, using NCHS population distribution #1 (Table 2). All fatal indicators should be calculated by searching the *underlying cause of death field only*, with the exception of the indicator for fatal traumatic brain injury (TBI). For the fatal TBI indicator, all fields in a multiple cause of death file should be searched.

Count deaths in state residents only.

Fatal TBI: N-Codes 800.0-801.9, 803.0-804.9, 850.0-854.1, 873.0-873.9

Drowning: (1) All Intents: E-codes E830, E832, E910, E954, E964, E984 (2) Unintentional: E-codes E830, E832, E910

Fatal fire-related injuries: E-codes E890-E899

Fatal firearm injuries: E-codes E922.0-E922.3, E922.8, E922.9, E955.0-E955.4, E965.0-E965.4, E985.0-E985.4, E970

Homicide: E-codes E960-E969

Suicide: E-codes E950-E959

Fatal MVC injuries: (1) Traffic and Nontraffic: E-codes E810-E825 (2) Traffic: E-codes E810-E819

Source: Hospital Discharge Data (HDD)

Hospitalizations should be age adjusted to the 2000 standard, using NCHS population distribution #1 (Table 2).

Include only non-federal, acute-care, inpatient facilities in your HDD data set. This excludes Veterans Administration (VA) and other federal hospitals, rehabilitation centers, and psychiatric hospitals.

Include re-admissions, transfers, and deaths in the hospital.

Count hospitalizations in state residents only.

Calculations should be based on records with duplications included ("undeduplicated"). If this is not possible, please note that records were de-duplicated/unduplicated.

To calculate the indicators defined below, you will first need to create a subset of hospital discharge records based on the principal diagnosis field. The subset created will be injury hospitalizations, defined below.

> Injury hospitalization: A record in which the principal reason for admission, after study, to a non-federal, acute-care, inpatient facility was an injury, including late effects, but excluding adverse effects of therapeutic use of drugs and adverse effects of medical/surgical care and the late effects of those adverse effects.

Instructions for creating the Injury Hospitalizations subset of a state hospital discharge data set

Search only the principal diagnostic code field for the included N-codes. Exclude all other records from the injury hospitalization subset.

Table of Diagnosis Codes to Include in Injury Hospitalization Surveillance Subset

Include

800-909.2, 909.4, 909.9

Fractures; dislocations; sprains and strains; intracranial injury; internal injury of thorax, abdomen and pelvis; open wound of the head, neck, trunk, upper limb, and lower limb; injury to blood vessels; late effects of injuries, poisoning, toxic effects and other external causes, excluding those of complications of surgical and medical care and drugs, medicinal or biological substances.

Superficial injury; contusion; crushing injury; effects of foreign body entering through orifice; burns; injury to nerves and spinal cord; traumatic complications and unspecified injuries.

Appendix B *continued*

Table of Diagnosis Codes to Include in Injury Hospitalization Surveillance Subset (continued)

Include

910-994.9
Poisoning and toxic effects of substances; other and unspecified effects of external causes.

995.5-995.59
Child maltreatment syndrome

995.80-995.85
Adult maltreatment, unspecified; adult physical abuse; adult emotional/psychological abuse; adult sexual abuse; adult neglect (nutritional); other adult abuse and neglect

Table of Diagnosis Codes to Exclude from Injury Hospitalization Surveillance Subset

Exclude

< 800

909.3, 909.5
Late effects of complications of surgical and medical care; late effects of adverse effects of drug, medicinal or biological substance.

995.0-995.4, 995.6-995.7, 995.86, 995.89
Other anaphylactic shock; angioneurotic edema; unspecified adverse effect of drug, medicinal and biological substance; allergy, unspecified; shock due to anesthesia; anaphylactic shock due to adverse food reaction; malignant hyperpyrexia or hypothermia due to anesthesia.

996-999
Complications due to certain specified procedures; complications affecting specified body systems, not elsewhere classified; other complications of procedures, NEC; complications of medical care, NEC.

Instructions for Reporting E Codes

Once the injury hospitalization subset has been created, calculate the injury indicators defined below by searching for E codes in the following manner. Search all diagnosis fields. If there is a designated E code field in your data set, start with the designated E code field. Count the first-listed valid E code, unless it is E849, E967, E869.4, E870-879, or E930-949, in which case, search any additional E code fields and all diagnostic fields and use the next listed valid E code.

Hospitalizations for Injury:

N-Codes 800-909.2, 909.4, 909.9-994.9, 995.5-995.59, 995.80-995.85.
Search only principal diagnostic field. (This should be all records in your injury hospitalization subset.)

Hospitalizations for TBI:

N-Codes 800.0-801.9, 803.0-804.9, 850.0-854.1, 959.01.
Search all diagnosis fields of the injury hospitalization subset.

Hospitalizations for Near-drowning:

N-Code 994.1 and/or E-codes E830, E832, E910, E954, E964, or E984
Search all diagnosis fields for N code. Search for E codes as described above.

Hospitalizations for Fire-related Injuries:

E-codes E890-E899

Hospitalizations for Firearm Injuries:

E-codes E922.0-E922.3, E922.9, E955.0-E955.4, E965.0-E965.4, E985.0-E985.4, or E970

Hospitalizations for Suicide Attempts:

E-codes E950-E959

Hospitalizations for Motor Vehicle Crash Injuries:

(1) E-codes E810-E825 (2) E-codes E810-E819

Instructions for Reporting E Codes (continued)

Percentage of HDD Injury Hospitalizations with External Cause Coding

(All hospital discharges with an injury principal diagnosis and an associated E-code/ All hospital discharges with an injury principal diagnosis) X 100 —see detailed instructions below.

Percentage of HDD Injury Hospitalizations with External Cause Coding =

[(# records with principal diagnosis of ICD-9 CM 800-994, 995.5 and 995.80-995.85, excluding ICD-9 CM 909.3 and 909.5 that have a valid E code other than E 849, E967, E869.4, E870-879, or E930-949) / (# records with principal diagnosis of ICD-9 CM 800-994, 995.5 and 995.80-995.85, excluding ICD-9 CM 909.3 and 909.5)] X 100

Source: BRFSS

Not all BRFSS questions are asked every year. Please report the indicator for 1997.

BRFSS indicators are found at www.cdc.gov/nccdphp.

Do not age adjust.

Report weighted estimates.

Smoke alarm prevalence:

When was the last time you or someone else deliberately tested all of the smoke detectors in your home? Report percentage answering any testing, as one answer choice is "No smoke detectors in home".

Percentage of Adults Reporting Always Using Safety Belts:

How often do you use seatbelts when you drive or ride in a car? Report percentage answering "Always."

Percentage of Adults with Children Reporting Always Using Child Restraints:

How often does the __ year-old child in your household use a …car safety seat…when they ride in a car? Report percentage answering "Always." Do not include missing responses (i.e., adults without children) in the denominator.

Percentage of Adults Reporting Driving After Having Drunk Too Much in the Last 30 Days:

How often have you driven after having perhaps too much to drink during the last 30 days? Report percentage answering 1 or more times.

Source: YRBS

YRBS is a biennial survey. Please report the indicator for the 1997.

YRBS indicators should be reported as percentage of respondents.

Do not age adjust.

Report weighted estimates.

Percentage of High School Students Reporting a Suicide Attempt in the Last Year:

Report percentage of respondents answering one or more attempts.

Percentage of High School Students Reporting Always Using Safety Belts:

How often do you wear a seatbelt when riding in a car driven by someone else? Report percentage of respondents answering "Always."

Source: FARS

Alcohol-involved MVC Deaths:

An alcohol-related crash death is defined as a death in a motor vehicle traffic crash where either the driver or nonoccupant (e.g. pedestrian) had a blood alcohol concentration (BAC) > or = 0.01 g/dl in a police-reported traffic crash.

State-specific counts are published by NHTSA in the annual publication *Traffic Safety Facts*. To calculate the crude alcohol-involved MVC death rate, look up the count in Table 114 "Persons Killed, by State and Highest Blood Alcohol Concentration in the Crash." The numerator for calculating this rate is in the column "Total Killed in Alcohol-related Crashes." Use the estimated state population for the year as the denominator. Using this method, it will not be possible to calculate age-adjusted rates, as age-specific counts are not provided in the tables.

Appendix B *continued*

Table 2.
Age Adjustment Table, Age Distribution #1
All Ages, 11 Age Groups

	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