CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

August 29, 1997 / Vol. 46 / No. RR-14

MMWR™

Recommendations and Reports

MORBIDITY AND MORTALITY WEEKLY REPORT

Recommended Framework for Presenting Injury Mortality Data

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control
and Prevention (CDC)
Atlanta, Georgia 30333

The *MMWR* series of publications is published by the Epidemiology Program Office, Centers for Disease Control and Prevention (CDC), Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA 30333.

SUGGESTED CITATION

Centers for Disease Control and Prevention. Recommended framework for presenting injury mortality data. MMWR 1997;46(No. RR-14):[inclusive page numbers].

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Copies can be purchased from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-9325. Telephone: (202) 512-1800.

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American Academy of Pediatrics
American Association of Poison Control Centers
American Association of Suicidology
American Burn Association
American College of Emergency Physicians
American College of Surgeons
American Health Information Management Association
American Hospital Association
American Medical Association
American Public Health Association
American Society of Criminology
American Trauma Society
Association of State and Territorial Health Officers
Centers for Disease Control and Prevention
- National Center for Environmental Health
- National Center for Health Statistics
- National Center for Injury Prevention and Control
- National Institute for Occupational Safety and Health

Consumer Product Safety Commission
Council of State and Territorial Epidemiologists
Department of Justice
- Bureau of Justice Statistics
- Federal Bureau of Investigation

Department of Transportation
- National Highway Traffic Safety Administration
- Federal Highway Administration

Indian Health Service
International Collaborative Effort for Injury Statistics
Health Resources and Services Administration
- Maternal and Child Health Bureau

National Association of Public Health Statistics and Information Systems
National Fire Administration
National Institutes of Health
- National Institute on Aging
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- National Institute on Drug Abuse
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Recommended Framework for Presenting Injury Mortality Data

Summary

Injuries are a substantial and preventable public health problem and account for approximately 6% of deaths in the United States. Many injury epidemiology and injury control programs depend on injury mortality and morbidity data aggregated by external cause of injury codes (E codes) for program planning and evaluation. This report provides a framework for the uniform tabulation and analysis of injury mortality data classified by the Ninth Revision of the International Classification of Diseases (ICD-9) (a subsequent report will address the application of this framework to injury morbidity data). Standard ICD-9 E-code groupings are presented in the form of a matrix and are depicted as mechanism by intent of injury. All cells in the matrix are mutually exclusive. Injury mortality data from the National Center for Health Statistics (NCHS) are presented in the matrix for 1993 to illustrate numbers of deaths within each cell. Justifications are given for assigning E codes to major categories and subcategories within the matrix.*

The groupings of external causes presented in this framework were developed by CDC (National Center for Injury Prevention and Control [NCIPC] and NCHS) in collaboration with members of the American Public Health Association's Injury Control and Emergency Health Services Section (ICEHS). These groupings are intended to assist persons involved in planning and evaluating injury control programs at national, state, and local levels and are relevant for all persons who collect, code, analyze, and report injury data.

Public health researchers and other public health professionals are encouraged to adopt or adapt these groupings as a minimum framework for tabulating injury deaths and death rates. For historical continuity, vital statistics programs will continue to use tabulation standards based on both the guidelines of the World Health Organization and derivative lists developed by CDC (NCHS) for presentation of national mortality statistics. The proposed framework can be used to supplement these tabulation standards by providing more detailed presentations of injury deaths and death rates, which are useful for making policy decisions and planning injury prevention activities.

INTRODUCTION

Injuries* are a substantial and preventable public health problem. For example, in the United States in 1993, injuries accounted for 57% and 78% of all deaths among persons aged 1–34 and 15–24 years, respectively (*1*).

*The term "injury" in this report includes a) unintentional injuries, suicides, and homicides and b) injuries from undetermined intent, legal intervention (i.e., law enforcement), and operations of war. The term does not include adverse effects of both medical care and therapeutic use of drugs. Although persons involved in the field of injury control prefer the term "unintentional injury" rather than the word "accident," the latter is used in the Ninth Revision of the International Classification of Diseases (ICD-9) External Causes of Injury and Poisoning System. Thus, "accident" is used in this report when referring to specific ICD-9 terminology.

Many injury epidemiology and injury control programs depend on injury mortality and morbidity data aggregated by external cause of injury codes (E codes) for program planning and evaluation. Such data are relevant for all persons engaged in injury research, prevention, and control activities and for those who collect, code, analyze, and report data concerning injury.

External causes of injury and poisoning are a component of an internationally established classification system for mortality data—the *Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death, Ninth Revision* (ICD-9)—which was promulgated by the World Health Organization (WHO) (*2*). (A clinical modification of ICD-9, designated as ICD-9-CM [*3*], is used for morbidity coding in the United States.) These external causes are classified into several hundred categories, each of which is designated by a four or five character code (E code), which begins with an "E" and is followed by a three- or four-digit number (e.g., E965). E codes range from E800.0 through E999.

The groupings of external causes presented in this framework were developed by CDC (National Center for Injury Prevention and Control [NCIPC] and National Center for Health Statistics [NCHS]) in collaboration with members of the American Public Health Association's Injury Control and Emergency Health Services Section (ICEHS). This minimum framework is presented in the form of a matrix, depicted as mechanism by intent of injury (e.g., poisoning-related [mechanism] suicide [intent]). The categories of external causes within the matrix are mutually exclusive. Presenting numbers of deaths in each category of the matrix provides useful information about the specific mechanism and intent of injury. In addition, by aggregating across categories, data can be summarized by using the marginal totals to describe injury deaths by either general mechanism or intent categories (e.g., deaths caused by poisoning or suicide). Certain E codes pertain to abnormal reactions and complications of medical care (E870.0–E879.9) and adverse effects of the therapeutic use of drugs (E930.0–E949.9). The proposed framework excludes these external cause groupings from the summary category of "all injuries" but includes them in the summary category of "all external causes."

In this report, recommended external cause groupings are described and used to define categories for a basic table of injury mortality data. Data are presented for 1993 to illustrate numbers of deaths within each cell; data from this year were used because they were the most current at the time the initial draft of this report was prepared. The rationale for each external cause grouping is discussed, with reference to its usefulness for program planning and in making general comparisons of injury mortality across international, national, state, and local jurisdictions.

CLASSIFYING EXTERNAL CAUSE OF INJURY DATA

Injury prevention and control activities in the United States have accelerated in the past decade. Since 1985, several documents have been published that highlight the importance of external cause of injury data in a) defining injury as a public health problem, b) identifying and characterizing risk factors, and c) developing effective prevention activities (*4–9*). These documents emphasize the need for health information specialists, injury researchers, and injury control practitioners to standardize the collection, processing, and tabulation of reliable and comparable injury data.

The ICD classification system and its external cause of injury codes facilitate aggregation of information regarding adverse health conditions. The universal adoption of this system by all members of WHO permits comparison of disease and injury problems among jurisdictions within one country and among several countries across time. The system originated as the International List of Causes of Deaths and was adopted in 1893 by the International Statistical Institute. The classification system has been revised approximately every 10 years since the beginning of the century. The early revisions of the system contained a chapter concerning "violent or accidental" deaths, which addressed external causes. As a result of the Sixth Revision Conference in 1948, the first undertaken by WHO, international agreement was reached about rules for assigning E codes to describe underlying cause of death. Trained coders now assign E codes drawing on cause-of-death information provided by coroners, medical examiners, and other medical-legal officers.

Under the ninth revision of the ICD, most E codes can be used to group the circumstances of an injury or poisoning along two dimensions: intent (i.e., manner) and mechanism of injury (i.e., cause of death). The classification by intent has the following groupings: accident (i.e., unintentional), suicide (i.e., intentionally self-inflicted), homicide (i.e., intentionally inflicted by another), and intent undetermined. Injuries associated with legal intervention and operations of war are classified separately. The classification by mechanism characterizes the external agents or particular activities that caused the injury (e.g., motor vehicle, firearm, submersion, fall, and poisoning). The intent of injury takes precedence in the classification, with mechanism of injury being coded within an intent category. For example, suicides and self-inflicted injuries (intent) by cutting and piercing instruments (mechanism) have their own category, which is coded as "E956," whereas suicides by poisoning are categorized as "E950–E952." Three fourths of the three- to four-digit E codes are assigned to accidents or unintentional injury (E800.0–E869.9, E880.0–E929.9), adverse effects of medical care (E870.0–E879.9), and adverse effects of the therapeutic use of drugs (E930.0–E949.9); the remaining codes include suicide (E950.0–E959.9), homicide (E960.0–E969), legal intervention (E970–E978), intent undetermined (E980.0–E989), and operations of war (E990.0–E999).

Persons in the field of injury control have given increasing attention to the mechanisms of injury, because evaluation research (*10*) indicates that "passive protection" through modification of consumer products and environments is most effective in reducing injury—regardless of intent. However, the intent of injury also can be important when determining effective interventions that involve changes in human behavior (*11*). Standard external cause groupings that allow uniform aggregation of injury deaths by mechanism and intent are paramount for injury prevention activities. Such groupings can facilitate comparisons of injury mortality data across studies, jurisdictions, and populations; help to define and characterize injury mortality as a public health problem; and aid in determining target populations at high risk.

Within the framework of the WHO tabulation guidelines for mortality, NCHS has developed several aggregated lists for tabulating cause of death (*1,12,13*). In the NCHS lists, injury-related deaths are divided into four major categories: accidents and adverse effects (E800–E949) (with a subcategory for motor vehicle accidents [E810–E825] and all other accidents [E800–E807, E826–E949]); suicide (E950–E959); homicide and legal intervention (E960–E978); and all other external causes (E980–E999). These

major categories have been useful for monitoring the 10 leading causes of death in the United States for 1993 (Table 1) (*14*). More specific injury detail is subsumed under these broad categories. The detailed mortality tabulation list shows each of the most detailed ICD categories that are used for cause-of-death coding and classification. The categories in the NCHS lists are organized initially by manner (intent) and then by mechanism. In this report, these categories are reorganized into the injury matrix. More detailed breakdowns of injury- and violence-related deaths are needed by injury researchers, epidemiologists, and public health practitioners and officials; more specific E-code groupings are needed to help define the role of other mechanisms of injuries (e.g., falls, drownings, poisonings, fires and flames, and firearms).

DEVELOPING THE MINIMUM FRAMEWORK FOR CLASSIFYING INJURY MORTALITY DATA

Until recently, public health researchers created their own groupings of external causes of injury for specific studies and reports, and no effort was made to standardize which external causes should be assigned to specified categories. This effort is now underway. The recommendations presented in this report have resulted from collaboration by persons involved in classification and coding, injury prevention and surveillance activities, and the provision of medical care to injured persons. During

TABLE 1. Number of deaths and death rates per 100,000 population for 10 leading causes of death — United States, 1993

Ranking	Causes	ICD-9 Codes	No. of deaths	Rate*
1	Diseases of the heart	390–398, 402, 404–429	743,460	288.4
2	Malignant neoplasms	140–208	529,904	205.6
3	Cerebrovascular diseases	430–438	150,108	58.2
4	Chronic obstructive pulmonary diseases	490–496	101,077	39.2
5	**Accidents and adverse effects**	**E800–E949**	**90,523**	**35.1**
	Motor vehicle accidents	**E810–E825**	**41,893**	**16.3**
	All other accidents and adverse effects	**E800–E807, E826–E949**	**48,630**	**18.9**
6	Pneumonia and influenza	480–487	82,820	32.1
7	Diabetes mellitus	250	53,894	20.9
8	Human immunodeficiency virus infection (HIV)	042–044†	37,267	14.5
9	**Suicide**	**E950–E959**	**31,102**	**12.1**
10	**Homicide and legal intervention**	**E960–E978**	**26,009**	**10.1**
	All other causes	Residual	422,389	163.9
	Total		**2,268,553**	**880.0**

NOTE: The bolded categories denote the major external cause of death categories historically used to summarize injury-related deaths by the National Center for Health Statistics (NCHS) in annual U.S. mortality reports.

*Calculated as the crude death rate. The 1993 U.S. resident population used to calculate crude death rates was 257,783,004 (U.S. Bureau of the Census).

†Beginning in 1987, NCHS introduced categories 042–044 for classifying and coding HIV infection. These categories are not part of the *Ninth Revision International Classification of Diseases*.

Source: Department of Health and Human Services. Public use data tape: 1993—detail mortality file. Hyattsville, MD: National Center for Health Statistics, 1996.

1991–1992, CDC (NCIPC) collaborated with experts to assess various aspects and problems associated with assigning E codes and tabulating E-coded mortality and morbidity data. As a result of this assessment, standard E-code groupings for tabulating injury data were proposed. These proposed groupings were presented at the 1993 and 1994 annual meetings of the American Public Health Association's (APHA) Injury Control and Emergency Health Services Section (ICEHS), receiving the attention of health information specialists, injury researchers, and injury control practitioners—including staff from CDC (NCIPC and NCHS). A consensus was reached for supporting and continuing this project, and ICEHS was selected to serve as the organizational base for the project.

During Spring 1995, expert consultants prepared a draft report—Recommendations for Standard E Code Groupings for Morbidity and Mortality Data Systems (Berenholz Consulting Associates, unpublished data, 1995)—which included a proposed minimum framework for tabulating mortality and morbidity data by standard external-cause groupings. An accompanying document—a proposed matrix for presenting E-coded data by mechanism and intent (CDC, unpublished data, 1995) also was prepared.

In Summer 1995, these two documents were circulated to a wide constituency, including the members of ICEHS and persons representing public health and professional organizations. Comments were received from numerous persons and organizations; feedback also was obtained from project officers of the Vital Statistics Cooperative Program, from members of the International Collaborative Effort on Injury Statistics, and as a result of further discussions at the annual APHA meeting in November 1996. All of these comments were used to refine E-code groupings presented in the matrix and to make final recommendations for the minimum framework for tabulating injury mortality data.

These recommendations are intended to encourage the use of the injury matrix (Table 2) for presenting injury mortality data at national, state, and local levels and for use in international comparisons. However, vital statistics programs at the national and state levels also will continue to use categories consistent with international requirements and historic presentations of deaths and death rates by cause of death. In addition, categories historically used for tabulations of NCHS mortality data in *Vital Statistics of the United States* (*12–14*) and *Healthy People 2000: National Health Promotion and Disease Prevention Objectives* (*8*) will be used to maintain comparability of data across time and among geographic areas. The groupings and matrix recommended in this report augment the traditional tabulation categories by shifting the emphasis from manner of death (e.g., homicide, suicide, and unintentional injury) to a combination of mechanism by intent of death. This change in emphasis illuminates important aspects of injury as a public health problem that may be more amenable to prevention. For example, NCHS prepared the *Injury Chartbook in Health, United States, 1996–97,* which incorporates the matrix approach as a method for describing and understanding major public health problems (*15*).

Researchers and planners are encouraged to use the injury matrix when examining injury mortality data to more clearly depict the overall burden of cause-specific, injury-related fatalities. The new injury matrix is not intended to replace more specific or different groupings that are needed for special studies and projects. The applicability of the groupings in the matrix may differ for data presentations that address

TABLE 2. Proposed matrix table with assignment of E codes for injury mortality data

	Manner/intent				
Mechanism/cause	**Unintentional**	**Suicide**	**Homicide**	**Undetermined**	**Other***
Cut/pierce	E920.0–.9	E956	E966	E986	E974
Drowning/submersion	E830.0–.9, E832.0–.9, E910.0–.9	E954	E964	E984	—
Fall	E880.0–E886.9, E888	E957.0–.9	E968.1	E987.0–.9	—
Fire/burn	E890.0–E899, E924.0–.9	E958.1,.2,.7	E961; E968.0,.3	E988.1,.2,.7	—
Fire/flame	*E890.0–E899*	*E958.1*	*E968.0*	*E988.1*	—
Hot object/substance	*E924.0–.9*	*E958.2,.7*	*E961, E968.3*	*E988.2,.7*	—
Firearm	E922.0–.9	E955.0–.4	E965.0–.4	E985.0–.4	E970
Machinery	E919 .0–.9	—	—	—	—
MV traffic[†]	E810–E819 (.0–.9[§])	E958.5	—	E988.5	—
Occupant	*E810–E819 (.0,.1)*	—	—	—	—
Motorcyclist	*E810–E819 (.2,.3)*	—	—	—	—
Pedal cyclist	*E810–E819 (.6)*	—	—	—	—
Pedestrian	*E810–E819 (.7)*	—	—	—	—
Unspecified	*E810–E819 (.9)*	—	—	—	—
Pedal cyclist, other	E800–E807 (.3); E820–E825 (.6); E826.1,.9; E827–E829 (.1)	—	—	—	—
Pedestrian, other	E800–E807 (.2), E820–E825 (.7), E826–E829 (.0)	—	—	—	—
Transport, other	E800–E807 (.0,.1,.8,.9), E820–E825 (.0–.5,.8,.9), E826.2–.8, E827–E829 (.2–.9), E831.0–.9, E833.0–E845.9	E958.6	—	E988.6	—
Natural/environmental	E900.0–E909, E928.0–.2	E958.3	—	E988.3	—
Bites and stings	*E905.0–.6,.9; E906.0–.4,.9*	—	—	—	—
Overexertion	E927	—	—	—	—
Poisoning	E850.0–E869.9	E950.0–E952.9	E962.0–.9	E980.0–E982.9	E972
Struck by, against	E916–E917.9	—	E960.0, E968.2	—	E973, E975
Suffocation	E911–E913.9	E953.0–.9	E963	E983.0–.9	—

TABLE 2. Proposed matrix table with assignment of E codes for injury mortality data — Continued

	Manner/intent				
Mechanism/cause	**Unintentional**	**Suicide**	**Homicide**	**Undetermined**	**Other***
Other specified, classifiable	E846–E848, E914–E915, E918, E921.0–.9, E923.0–.9, E925.0–E926.9, E929.0–.5	E955.5,.9; E958.0,.4	E960.1, E965.5–.9, E967.0–.9, E968.4	E985.5; E988.0,.4	E971, E978, E990–E994, E996, E997.0–.2
Other specified, not elsewhere classifiable	E928.8, E929.8	E958.8, E959	E968.8, E969	E988.8, E989	E977, E995, E997.8, E998, E999
Unspecified	E887, E928.9, E929.9	E958.9	E968.9	E988.9	E976, E997.9
All injury¶	**E800–E869, E880–E929**	**E950–E959**	**E960–E969**	**E980–E989**	**E970–E978, E990–E999**
Adverse effects	—	—	—	—	E870–E879, E930.0–E949.9
*Medical care***	—	—	—	—	E870–E879
Drugs††	—	—	—	—	E930.0–E949.9
All external causes	**—**	**—**	**—**	**—**	**E800–E999**

NOTE: "—" represents categories in which no E codes are assigned.

*Includes legal intervention (E970–E978) and operations of war (E990–E999).
†Three fourth-digit codes (.4—"occupant of streetcar," .5—"rider of animal," and .8—"other specified person") are not separated because of the minimal number of deaths in these categories. However, because they are included in the overall "Motor Vehicle Traffic" category, the sum of these categories can be derived by subtraction.
§This parenthetical notation implies that the decimal should be applied to each individual three-digit E code in the grouping.
¶Adverse effects have been excluded from the "all injury" category but are included in the "all external causes" category.
**Includes a) adverse effects to patients during surgical and medical care and b) surgical and medical procedures as the cause of abnormal reactions or later complications without mention of negative events at the time of procedure.
†† Includes drugs and medicinal and biological substances causing adverse effects when used therapeutically.

specific geographical regions, age groups, or mechanisms of injury and for targeted programs and research hypotheses. Access to unaggregated data is essential for persons undertaking more detailed statistical investigations. The goal of establishing both ICD-9 external cause groupings and the matrix is to enhance the usefulness of injury mortality data for current surveillance and prevention activities. A similar approach will be used to define a new standard external cause of injury grouping after ICD-10 coding is implemented in the United States.

USES OF MORTALITY DATA FOR INJURY PREVENTION

Using the matrix to tabulate injury data by external cause and intent of injury will provide essential information for assessing health outcomes (e.g., injury-related deaths) in relation to public-health–based injury prevention programs. The public health model addresses three sets of factors: host, agent, and environment, for which E-coded data provide important information. Successful injury prevention programs have either modified behavior (e.g., the wearing of seat belts and helmets [*16*]), addressed problems associated with hazardous agents (e.g., automobiles [*17*], flammable children's nightwear [*18*], packaging for drugs [*19*], and home-care products [*20*]) or addressed environmental hazards (e.g., bridge abutments, road surfaces and shoulders [*21*], and residential pools [*22*]). The most effective interventions have focused on passive protection, which is accomplished by changing agents and environments. Passive protection reduces the likelihood of injury, regardless of the behavior of those involved in an injury-related incident.

To be useful, E-coded mortality data must reflect accurate, specific information about the circumstances surrounding the injury-related incident that are recorded on the death certificate (*23,24*). The quality of these data can be improved by

- encouraging greater specificity in reporting and avoiding the use of generalized codes (e.g., "fracture, cause unspecified," "unspecified accident," and "assault by unspecified means");
- providing sufficient narrative detail in the item "how the injury occurred" on the death certificate to enhance the information in the cause-of-death section of the certificate (identifying when an agent [e.g., consumer product or type of motor vehicle] is involved in an injury and obtaining specific information about the agent and the injury scenario are particularly important, because that information is not routinely captured in the E code); and
- educating medical certifiers about the usefulness of E-coded mortality data.

BASIC INJURY MORTALITY TABLES

The proposed minimum framework for tabulating injury mortality data (Table 2) depicts the E codes assigned to each cell within the mechanism-by-intent matrix. Two major recommendations vary from the traditional way NCHS tabulates data regarding injury deaths (Table 1). First, an "all injury" category has been defined, which includes all injury mechanisms in the matrix except abnormal reactions and complications of medical care and adverse effects from the therapeutic use of drugs. NCHS historically

has tabulated "adverse effects" with "accidents," or unintentional injuries. However, these adverse effects traditionally have not been viewed as the responsibility of public health professionals in the field of injury prevention and control (*25*). The "all injury" category includes only injury mechanisms (or causes of death) that are considered pertinent to injury prevention and surveillance activities. Second, deaths by homicide and deaths caused by legal intervention are tabulated separately in the matrix table. Legal-intervention codes have been combined with operations-of-war codes to represent a separate column entitled "other" in the matrix. NCHS historically has reported homicides and deaths caused by legal intervention together. For comparison with mortality reports by NCHS (*14*), homicide and deaths from legal intervention can be combined.

The numbers of injury-related deaths and death rates in 1993, according to the E-code groupings in the matrix (Table 2) (*1*), provide an overview of the major causes of injury-related death by manner of death in the United States (Table 3). The "all injuries" category sums to 148,136 deaths with an additional 2,925 deaths caused by adverse effects of medical care and therapeutic use of drugs. These two distinct categories represent 151,061 deaths from "all external causes" of injury and poisoning.

IMPORTANCE OF NAMING CONVENTIONS

Specific naming conventions should be used to differentiate the proposed categories from the traditional injury tabulations of international, national, and state vital statistics data. For example, the proposed category of "Motor Vehicle Traffic" (E810-E819; E958.5; E988.5) differs from the traditional presentation of deaths under the heading "Motor Vehicle Accidents" (E810–E825) in that "Motor Vehicle Traffic" is restricted to deaths from motor vehicles occurring in traffic on public highways, including suicides and deaths from motor vehicles that are "intent undetermined." The traditional category "Motor Vehicle Accidents" includes these deaths and deaths from incidents involving motor vehicles being used in recreational or sporting activities off the highway. The proposed category also differs from the grouping "Motor Vehicle Traffic Accidents" (E810–E819) used in routine vital statistics tabulations, which includes only unintentional traffic-related deaths. The number of deaths in each of the three distinct groupings is similar, but not the same. Deaths from "Motor Vehicle Traffic" total 41,021, from "Motor Vehicle Accidents" 41,893, and from "Motor Vehicle Traffic Accidents" 40,899. Maintaining clear distinctions in naming conventions is essential to prevent confusion among persons who use the data. In any analyses of injury data, the appropriate E codes should be documented with the category name.

ACCOMMODATING A THIRD DIMENSION TO THE MATRIX TABLE

The display of data in the mechanism-by-intent table can be modified to accommodate a third dimension (e.g., age) (*26*). For example, the total number of injury deaths and death rates per 100,000 population for 1993 can be categorized according to the "intent-by-mechanism" categories and age of the decedent (Tables 4 and 5). Arranging the data in this manner indicates that 359 (78%) of the 462 homicides among children aged 10–14 years involved firearms (Table 4). For drowning among children

TABLE 3. Number of deaths and crude death rate* per 100,000 population, by mechanism- by-intent categories — United States, 1993

	Manner/intent											
	Unintentional		Suicide		Homicide		Undetermined		Other†		Total	
Mechanism/cause	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Cut/pierce	108	0.04	537	0.2	3,204	1.2	5	—§	—	—	**3,854**	**1.5**
Drowning	4,390	1.7	355	0.1	52	0.02	262	0.1	—	—	**5,059**	**2.0**
Falls	9,788	3.8	605	0.2	24	0.01	56	0.02	—	—	**10,473**	**4.1**
Fire/burn	4,030	1.6	188	0.1	227	0.1	102	0.04	—	—	**4,547**	**1.8**
Fire/flame	*3,900*	*1.5*	*187*	*0.1*	*214*	*0.1*	*97*	*0.04*	—	—	***4,398***	***1.7***
Hot object/ substance	*130*	*0.1*	*1*	—§	*13*	—§	*5*	—§	—	—	***149***	***0.1***
Firearm	1,521	0.6	18,940	7.3	18,253	7.1	563	0.2	318	0.1	**39,595**	**15.4**
Machinery	999	0.4	—	—	—	—	—	—	—	—	**999**	**0.4**
MV traffic¶	40,899	15.9	108	0.04	—	—	14	—§	—	—	***41,021***	***15.9***
Occupant	*24,586*	*9.5*	—	—	—	—	—	—	—	—	***24,586***	***9.5***
Motorcyclist	*1,927*	*0.7*	—	—	—	—	—	—	—	—	***1,927***	***0.7***
Pedal cyclist	*789*	*0.3*	—	—	—	—	—	—	—	—	***789***	***0.3***
Pedestrian	*5,978*	*2.3*	—	—	—	—	—	—	—	—	***5,978***	***2.3***
Unspecified	*7,583*	*2.9*	—	—	—	—	—	—	—	—	***7,583***	***2.9***
Pedal cyclist, other	116	0.04	—	—	—	—	—	—	—	—	**116**	**0.04**
Pedestrian, other	941	0.4	—	—	—	—	—	—	—	—	**941**	**0.4**
Transport, other	1,829	0.7	—	—	—	—	—	—	—	—	**1,829**	**0.7**
Natural/ environmental	1,544	0.6	8	—§	—	—	7	—§	—	—	**1,559**	**0.6**
Bites/stings	*89*	*0.03*	—	—	—	—	—	—	—	—	***89***	***0.03***
Overexertion	19	—§	—	—	—	—	—	—	—	—	**19**	**—**
Poisoning	8,537	3.3	5,271	2.0	59	0.02	1,903	0.7	—	—	**15,770**	**6.1**
Struck by, against	901	0.3	—	—	368	0.1	—	—	4	—§	**1,273**	**0.5**
Suffocation	4,178	1.6	4,627	1.8	954	0.4	76	0.03			**9,835**	**3.8**
Other specified and classifiable	1,626	0.6	308	0.1	363	0.1	25	0.01	31	0.01	**2,353**	**0.9**
Other specified, not elsewhere classifiable	109	—§	117	0.05	1,093	0.4	121	0.05	9	—§	**1,449**	**0.6**
Unspecified	6,063	2.4	38	0.01	1,056	0.4	285	0.1	2	—§	**7,444**	**2.9**
All injury	87,598	34.0	31,102	12.1	25,653	10.0	3,419	1.3	364	0.1	**148,136**	**57.5**
Adverse effects	—	—	—	—	—	—	—	—	—	—	**2,925**	**1.1**
Medical care	—	—	—	—	—	—	—	—	—	—	***2,724***	***1.1***
Drugs	—	—	—	—	—	—	—	—	—	—	***201***	***0.1***
All external causes	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**151,061**	**58.6**

NOTE: Cells contain "—" when no applicable deaths have occurred with the respective ICD-9 E codes.

*Rates are given to two decimal places when the rate is ≤0.05.

†Includes legal intervention (E970–E978) and operations of war (E990–E999).

§The crude death rate would have been based on <20 deaths.

¶Three fourth-digit codes (.4—"occupant of streetcar," .5—"rider of animal," and .8—"other specified person") are not separated because of the minimal number of deaths in these categories. However, because they are included in the overall "Motor Vehicle Traffic" category, the sum of these categories can be derived by subtraction.

Sources: Department of Health and Human Services. Public use data tape: 1993—detail mortality file. Hyattsville, MD: National Center for Health Statistics, 1996.

US Bureau of Census. U.S. population estimates by age, sex, race, and Hispanic origin: Census file RESPO793, 1995.

TABLE 4. Number of injury deaths according to intent and mechanism of injury, by age — United States, 1993

Intent and mechanism	All ages*	Age of decedent (yrs)												
		<1	1–4	5–9	10–14	15–19	20–24	25–34	35–44	45–54	55–64	65–74	75–84	≥85
All injuries†														
Cut/pierce	3,854	3	18	23	42	261	449	1,137	856	393	263	229	128	38
Drowning	5,059	87	580	196	244	440	451	918	739	427	320	309	204	93
Fall	10,473	12	70	24	33	137	190	550	727	665	793	1,338	2,703	3,226
Fire/burn	4,547	134	640	246	101	111	173	490	514	406	360	516	517	328
Firearm	39,595	14	102	141	700	4,794	6,410	9,391	6,526	3,932	2,616	2,509	1,900	526
Machinery	999	0	24	11	15	25	58	146	161	138	157	146	94	24
Motor-vehicle traffic	41,021	183	756	838	1,048	4,893	5,485	8,055	5,988	3,731	2,841	3,057	3,129	984
Pedal cyclist, other	116	0	5	9	12	7	7	18	20	13	9	10	3	2
Pedestrian, other	941	6	119	30	22	69	83	178	158	82	68	53	44	23
Transport, other	1,829	4	25	32	63	104	149	423	379	276	180	102	71	2
Natural/environmental	1,559	25	34	17	21	36	45	131	174	174	182	229	280	202
Overexertion	19	0	0	0	0	0	1	2	3	2	4	2	3	2
Poisoning	15,770	38	73	35	51	363	815	3,837	5,710	2,355	1,002	727	496	256
Struck by/against	1,273	7	47	28	27	42	84	230	275	193	122	133	62	23
Suffocation	9,835	414	220	74	191	467	729	1,704	1,386	816	663	929	1,185	1,040
Other specified, classifiable	2,353	172	177	29	41	99	174	433	410	273	161	125	138	118
Other specified, not elsewhere classifiable	1,449	28	46	26	23	67	125	308	314	184	107	97	70	50
Unspecified	7,444	142	129	34	35	115	158	440	497	416	453	788	1,719	2,499
Total	**148,136**	**1,269**	**3,065**	**1,793**	**2,669**	**12,030**	**15,586**	**28,391**	**24,837**	**14,476**	**10,301**	**11,299**	**12,746**	**9,454**
Unintentional														
Cut/pierce	108	0	4	7	0	2	9	16	21	14	11	11	9	4
Drowning	4,390	77	556	192	239	422	397	778	608	356	264	235	154	73
Fall	9,788	12	67	24	28	105	139	389	593	576	722	1,293	2,638	3,199
Fire/burn	4,030	121	600	224	91	91	141	400	420	340	309	478	495	315
Firearm	1,521	0	30	38	137	321	274	255	193	113	158	52	37	13
Machinery	999	0	24	11	15	25	58	146	161	138	157	146	94	24
Motor-vehicle traffic	40,899	183	756	838	1,046	4,876	5,470	8,030	5,957	3,719	2,834	3,051	3,124	982
Pedal cyclist, other	116	0	5	9	12	7	7	18	20	13	9	10	3	2
Pedestrian, other	941	6	119	30	22	69	83	178	158	82	68	53	44	23
Transport, other	1,829	4	25	32	63	104	149	423	379	276	180	102	71	20
Natural/environmental	1,544	24	34	17	21	35	45	130	173	171	179	228	277	202
Overexertion	19	0	0	0	0	0	1	2	3	2	4	2	3	2
Poisoning	8,537	20	59	22	27	148	386	2,268	3,412	1,143	384	279	238	145
Struck by/against	901	3	41	28	23	22	55	153	185	140	90	103	42	16
Suffocation	4,178	371	183	53	65	62	77	215	270	271	315	559	857	876
Other specified, classifiable	1,626	9	26	18	32	76	133	317	303	230	125	110	132	114
Other specified, not elsewhere classifiable	109	0	5	12	9	5	7	19	21	4	5	6	7	9
Unspecified	6,063	34	28	21	20	50	72	185	236	237	347	706	1,659	2,467
Total	**87,598**	**864**	**2,562**	**1,576**	**1,850**	**6,420**	**7,503**	**13,922**	**13,113**	**7,825**	**6,061**	**7,424**	**9,884**	**8,486**

TABLE 4. Number of injury deaths according to intent and mechanism of injury, by age — United States, 1993 — Continued

Intent and mechanism	All ages*	Age of decedent (yrs)												
		<1	1–4	5–9	10–14	15–19	20–24	25–34	35–44	45–54	55–64	65–74	75–84	≥85
Suicide														
Cut/pierce	537	NA	NA	0	1	7	19	109	116	86	69	79	38	13
Drowning	355	NA	NA	0	1	7	24	55	65	44	38	62	40	17
Fall	605	NA	NA	0	5	28	44	141	123	77	64	38	59	24
Fire/burn	188	NA	NA	0	2	12	13	37	47	34	19	19	4	1
Firearm	18,940	NA	NA	1	186	1,273	1,940	3,611	3,194	2,433	1,997	2,104	1,714	483
Motor-vehicle traffic	108	NA	NA	0	2	16	13	20	28	11	6	5	5	2
Natural/environmental	8	NA	NA	0	0	0	0	1	1	1	3	1	0	0
Poisoning	5,271	NA	NA	1	22	178	331	985	1,536	966	520	394	238	99
Suffocation	4,627	NA	NA	3	92	340	532	1,232	929	466	298	316	278	134
Other specified, classifiable	308	NA	NA	1	4	15	34	92	83	32	29	12	5	1
Other specified, not elsewhere classifiable	117	NA	NA	0	0	7	12	18	39	14	9	7	7	4
Unspecified	38	NA	NA	0	0	1	3	6	9	4	9	3	2	0
Total	**31,102**	**NA**	**NA**	**6**	**315**	**1,884**	**2,965**	**6,307**	**6,170**	**4,168**	**3,061**	**3,040**	**2,390**	**778**
Homicide														
Cut/pierce	3,204	3	13	16	41	252	420	1,011	719	292	182	139	81	21
Drowning	52	6	13	2	1	5	6	10	3	3	2	1	0	0
Fall	24	0	3	0	0	1	1	6	2	5	1	2	3	0
Fire/burn	227	10	34	17	6	7	9	39	32	24	18	11	12	8
Firearm	18,253	14	71	99	359	3,082	4,023	5,295	2,990	1,302	527	319	120	26
Poisoning	59	8	9	8	1	2	2	7	12	1	7	1	0	1
Struck by/against	368	4	6	0	4	20	29	77	87	53	32	30	19	7
Suffocation	954	31	34	17	18	58	115	245	178	74	48	53	49	28
Other specified, classifiable	363	163	151	10	4	6	3	7	5	2	4	2	1	3
Other specified, not elsewhere classifiable	1,093	20	38	14	13	51	94	256	235	146	83	64	49	26
Unspecified	1,056	85	92	11	15	56	74	210	187	120	65	64	43	19
Total	**25,653**	**344**	**464**	**194**	**462**	**3,540**	**4,776**	**7,163**	**4,450**	**2,022**	**969**	**686**	**377**	**139**
Undetermined														
Cut/pierce	5	0	1	0	0	0	1	1	0	1	1	0	0	0
Drowning	262	4	11	2	3	6	24	75	63	24	16	11	10	3
Fall	56	0	0	0	0	3	6	14	9	7	6	5	3	3
Fire/burn	102	3	6	5	2	1	10	14	15	8	14	8	6	4
Firearm	563	0	1	3	18	82	101	129	77	59	29	29	28	4
Motor-vehicle traffic	14	0	0	0	0	1	2	5	3	1	1	1	0	0
Natural/environmental	7	1	0	0	0	1	0	0	0	2	0	0	3	0
Poisoning	1,903	10	5	4	1	35	96	577	750	245	91	53	20	11
Suffocation	76	12	3	1	16	7	5	12	9	5	2	1	1	2
Other specified, classifiable	25	0	0	0	1	2	4	5	8	4	0	1	0	0

TABLE 4. Number of injury deaths according to intent and mechanism of injury, by age — United States, 1993 — Continued

Intent and mechanism	All ages*	Age of decedent (yrs) <1	1–4	5–9	10–14	15–19	20–24	25–34	35–44	45–54	55–64	65–74	75–84	≥85
Other specified, not elsewhere classifiable	121	8	3	0	1	4	12	14	19	19	10	13	7	11
Unspecified	285	23	9	2	0	8	9	38	64	55	32	15	15	13
Total	**3,419**	**61**	**39**	**17**	**42**	**150**	**270**	**884**	**1,017**	**430**	**202**	**137**	**93**	**51**
Other[§]														
Firearm	318	0	0	0	0	36	72	101	72	25	5	5	1	0
Struck by/against	4	0	0	0	0	0	0	0	3	0	0	0	1	0
Other specified, classifiable	31	0	0	0	0	0	0	12	11	5	3	0	0	0
Other specified, not elsewhere classifiable	9	0	0	0	0	0	0	1	0	1	0	7	0	0
Unspecified	2	0	0	0	0	0	0	1	1	0	0	0	0	0
Total	**364**	**0**	**0**	**0**	**0**	**36**	**72**	**115**	**87**	**31**	**8**	**12**	**2**	**0**
Adverse effects														
Medical care	2,724	34	26	23	16	14	15	75	115	186	321	663	753	483
Drugs	201	0	2	0	1	3	11	25	27	18	23	38	28	25
Total	**2,925**	**34**	**28**	**23**	**17**	**17**	**26**	**100**	**142**	**204**	**344**	**701**	**781**	**508**
All external causes	**151,061**	**1,303**	**3,093**	**1,816**	**2,686**	**12,047**	**15,612**	**28,491**	**24,979**	**14,680**	**10,645**	**12,000**	**13,527**	**9,962**

* Includes deaths from injuries in which the age of the decedent was unknown.
† Excludes all abnormal reactions and complications of medical care and adverse effects of the therapeutic use of drugs.
§ Includes legal intervention (E970–E978) and operations of war (E990–E999).

Source: Department of Health and Human Services. Public use data tape: 1993—detail mortality file. Hyattsville, MD: National Center for Health Statistics, 1996.

TABLE 5. Injury death rates* per 100,000 population according to intent and mechanism, by age — United States, 1993

Intent and mechanism	All ages†	Age of decedent (yrs) <1	1–4	5–9	10–14	15–19	20–24	25–34	35–44	45–54	55–64	65–74	75–84	≥85
All injuries§														
Cut/pierce	1.5	—¶	—	0.1	0.2	1.5	2.4	2.7	2.1	1.4	1.3	1.2	1.2	1.1
Drowning	2.0	2.2	3.7	1.1	1.3	2.5	2.4	2.2	1.8	1.5	1.5	1.7	1.9	2.7
Fall	4.1	—	0.4	0.1	0.2	0.8	1.0	1.3	1.8	2.3	3.8	7.2	25.2	94.5
Fire/burn	1.8	3.4	4.1	1.3	0.5	0.6	0.9	1.2	1.3	1.4	1.7	2.8	4.8	9.6
Firearm	15.4	—	0.6	0.8	3.8	27.8	34.2	22.4	16.0	13.7	12.5	13.5	17.7	15.4
Machinery	0.4	—	0.2	—	—	0.1	0.3	0.3	0.4	0.5	0.8	0.8	0.9	0.7
Motor-vehicle traffic	15.9	4.7	4.8	4.5	5.7	28.3	29.2	19.2	14.7	13.0	13.6	16.4	29.2	28.8
Pedal cyclist, other	0.04	—	—	—	—	—	—	—	0.05	—	—	—	—	—
Pedestrian, other	0.4	—	0.8	0.2	0.1	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.7
Transport, other	0.7	—	0.2	0.2	0.3	0.6	0.8	1.0	0.9	1.0	0.9	0.5	0.7	0.6
Natural/environmental	0.6	0.6	0.2	—	0.1	0.2	0.2	0.3	0.4	0.6	0.9	1.2	2.6	5.9
Overexertion	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Poisoning	6.1	1.0	0.5	0.2	0.3	2.1	4.3	9.2	14.0	8.2	4.8	3.9	4.6	7.5
Struck by/against	0.5	—	0.3	0.2	0.1	0.2	0.4	0.5	0.7	0.7	0.6	0.7	0.6	0.7
Suffocation	3.8	10.6	1.4	0.4	1.0	2.7	3.9	4.1	3.4	2.8	3.2	5.0	11.1	30.5
Other specified, classifiable	0.9	4.4	1.1	0.2	0.2	0.6	0.9	1.0	1.0	1.0	0.8	0.7	1.3	3.5
Other specified, not elsewhere classifiable	0.6	0.7	0.3	0.1	0.1	0.4	0.7	0.7	0.8	0.6	0.5	0.5	0.7	1.5
Unspecified	2.9	3.6	0.8	0.2	0.2	0.7	0.8	1.1	1.2	1.5	2.2	4.2	16.0	73.2
Total	**57.5**	**32.4**	**19.4**	**9.7**	**14.4**	**69.7**	**83.1**	**67.8**	**60.9**	**50.5**	**49.2**	**60.6**	**118.9**	**277.0**
Unintentional														
Cut/pierce	0.04	—	—	—	—	—	—	—	0.05	—	—	—	—	—
Drowning	1.7	2.0	3.5	1.0	1.3	2.4	2.1	1.9	1.5	1.2	1.3	1.3	1.4	2.1
Fall	3.8	—	0.4	0.1	0.2	0.6	0.7	0.9	1.5	2.0	3.5	6.9	24.6	93.7
Fire/burn	1.6	3.1	3.8	1.2	0.5	0.5	0.8	1.0	1.0	1.2	1.5	2.6	4.6	9.2
Firearm	0.6	—	0.2	0.2	0.7	1.9	1.5	0.6	0.5	0.4	0.3	0.3	0.3	—
Machinery	0.4	—	0.2	—	—	0.1	0.3	0.3	0.4	0.5	0.8	0.8	0.9	0.7
Motor-vehicle traffic	15.9	4.7	4.8	4.5	5.6	28.2	29.2	19.2	14.6	13.0	13.5	16.4	29.1	28.8
Pedal cyclist, other	0.04	—	—	—	—	—	—	—	0.05	—	—	—	—	—
Pedestrian, other	0.4	—	0.8	0.2	0.1	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.7
Transport, other	0.7	—	—	0.2	0.3	0.6	0.8	1.0	0.9	1.0	0.9	0.5	0.7	—
Natural/environmental	0.6	0.6	0.2	—	0.1	0.2	0.2	0.3	0.4	0.6	0.9	1.2	2.6	5.9
Overexertion	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Poisoning	3.3	0.5	0.4	0.1	0.1	0.9	2.1	5.4	8.4	4.0	1.8	1.5	2.2	4.2
Struck by/against	0.3	—	0.3	0.2	0.1	0.1	0.3	0.4	0.5	0.5	0.4	0.6	0.4	—
Suffocation	1.6	9.5	1.2	0.3	0.4	0.4	0.4	0.5	0.7	0.9	1.5	3.0	8.0	25.7
Other specified, classifiable	0.6	—	0.2	—	0.2	0.4	0.7	0.8	0.7	0.8	0.6	0.6	1.2	3.3
Other specified, not elsewhere classifiable	0.04	—	—	—	—	—	—	—	0.1	—	—	—	—	—
Unspecified	2.4	0.9	0.2	0.1	0.1	0.3	0.4	0.4	0.6	0.8	1.7	3.8	15.5	72.3
Total	**34.0**	**22.1**	**16.2**	**8.5**	**10.0**	**37.2**	**40.0**	**33.2**	**32.2**	**27.3**	**29.0**	**31.8**	**92.2**	**248.6**

TABLE 5. Injury death rates* per 100,000 population according to intent and mechanism, by age — United States, 1993 — Continued

Intent and mechanism	All ages†	Age of decedent (yrs)												
		<1	1–4	5–9	10–14	15–19	20–24	25–34	35–44	45–54	55–64	65–74	75–84	≥85
Suicide														
Cut/pierce	0.2	NA	NA	—	—	—	—	0.3	0.3	0.3	0.3	0.4	0.4	—
Drowning	0.1	NA	NA	—	—	—	0.1	0.1	0.2	0.2	0.2	0.3	0.4	—
Fall	0.2	NA	NA	—	—	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.6	0.7
Fire/burn	0.1	NA	NA	—	—	—	—	0.1	0.1	0.1	—	—	—	—
Firearm	7.3	NA	NA	—	—	7.4	10.3	8.6	7.8	8.5	9.5	11.3	16.0	14.2
Motor-vehicle traffic	0.04	NA	NA	—	—	—	—	0.05	0.1	—	—	—	—	—
Natural/environmental	—	NA	NA	—	—	—	—	—	—	—	—	—	—	—
Poisoning	2.0	NA	NA	—	0.1	1.0	1.8	2.4	3.8	3.4	2.5	2.1	2.2	2.9
Suffocation	1.8	NA	NA	—	0.5	2.0	2.8	2.9	2.3	1.6	1.4	1.7	2.6	3.9
Other specified, classifiable	0.1	NA	NA	—	—	—	0.2	0.2	0.2	0.1	0.1	—	—	—
Other specified, not elsewhere classifiable	0.05	—	—	—	—	—	—	—	0.1	—	—	—	—	—
Unspecified	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	**12.1**	**NA**	**NA**	**—**	**1.7**	**10.9**	**15.8**	**15.1**	**15.1**	**14.5**	**14.6**	**16.3**	**22.3**	**22.8**
Homicide														
Cut/pierce	1.2	—	—	—	0.2	1.5	2.2	2.4	1.8	1.0	0.9	0.7	0.8	0.6
Drowning	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—
Fall	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—
Fire/burn	0.1	—	0.2	—	—	—	—	0.1	0.1	0.1	—	—	—	—
Firearm	7.1	—	0.5	0.5	1.9	17.8	21.4	12.6	7.3	4.5	2.5	1.7	1.1	0.8
Poisoning	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—
Struck by/against	0.1	—	—	—	—	0.1	0.2	0.2	0.2	0.2	0.2	0.2	—	—
Suffocation	0.4	0.8	0.2	—	—	0.3	0.6	0.6	0.4	0.3	0.2	0.3	0.5	0.8
Other specified, classifiable	0.1	4.2	1.0	—	—	—	—	—	—	—	—	—	—	—
Other specified, not elsewhere classifiable	0.4	0.5	0.2	—	—	0.1	0.5	0.6	0.6	0.5	0.4	0.3	0.5	0.8
Unspecified	0.4	2.2	0.6	—	—	0.1	0.4	0.5	0.5	0.4	0.3	0.3	0.4	—
Total	**10.0**	**8.8**	**2.9**	**1.0**	**2.5**	**20.5**	**25.5**	**17.1**	**10.9**	**7.1**	**4.6**	**3.7**	**3.5**	**4.1**
Undetermined														
Cut/pierce	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Drowning	0.1	—	—	—	—	—	0.1	0.2	0.2	0.1	—	—	—	—
Fall	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—
Fire/burn	0.04	—	—	—	—	—	—	—	—	—	—	—	—	—
Firearm	0.2	—	—	—	—	0.5	0.5	0.3	0.2	0.2	0.1	0.2	0.3	—
Motor-vehicle traffic	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Natural/environmental	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Poisoning	0.7	—	—	—	—	0.2	0.5	1.4	1.8	0.9	0.4	0.3	0.2	—
Suffocation	0.03	—	—	—	—	—	—	—	—	—	—	—	—	—
Other specified, classifiable	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—

TABLE 5. Injury death rates* per 100,000 population according to intent and mechanism, by age — United States, 1993 — Continued

Intent and mechanism	All ages†	Age of decedent (yrs)												
		<1	1–4	5–9	10–14	15–19	20–24	25–34	35–44	45–54	55–64	65–74	75–84	≥85
Other specified, not elsewhere classifiable	0.05	—	—	—	—	—	—	—	—	—	—	—	—	—
Unspecified	0.1	0.6	—	—	—	—	—	0.1	0.2	0.2	0.2	—	—	—
Total	**1.3**	**1.6**	**0.2**	**—**	**0.2**	**0.9**	**1.4**	**2.1**	**2.5**	**1.5**	**1.0**	**0.7**	**0.9**	**1.5**
Other**														
Firearm	0.1	—	—	—	—	0.2	0.4	0.2	0.2	0.1	—	—	—	—
Struck by/against	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other specified, classifiable	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—
Other specified, not elsewhere classifiable	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unspecified	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	0.1	—	—	—	—	0.2	0.4	0.3	0.2	0.1	—	—	—	—
Adverse effects														
Medical care	1.1	0.9	0.2	0.1	—	—	—	0.2	0.3	0.6	1.5	3.6	7.0	14.2
Drugs	0.1	—	—	—	—	—	—	0.1	0.1	—	0.1	0.2	0.3	0.7
Total	1.1	0.9	0.2	0.1	—	—	0.1	0.2	0.3	0.7	1.6	3.8	7.3	14.9
All external causes	**58.6**	**33.3**	**19.6**	**9.8**	**14.5**	**69.8**	**83.2**	**68.0**	**61.2**	**51.2**	**50.9**	**64.4**	**126.2**	**291.9**

*Death rates given are crude death rates.
†Includes deaths from injuries in which the age of the decedent was unknown.
§Excludes all abnormal reactions and complications of medical care and adverse effects of the therapeutic use of drugs.
¶Cells contain "—" when the crude death rate would have been based on <20 deaths. Rates are given in two decimal places when the rate was ≤0.05.
**Includes legal intervention (E970–E978) and operations of war (E990–E999).
NA = not applicable.

Sources: Department of Health and Human Services. Public use data tape: 1993—detail mortality file. Hyattsville, MD: National Center for Health Statistics, 1996.

US Bureau of Census. U.S. population estimates by age, sex, race, and Hispanic origin: 1993. Census file RESPO793, 1995.

aged 0–14 years, the intent of injury is predominantly unintentional. For deaths from poisoning among persons aged 25–44 years, intent of injury could not be determined for 1,327 (14%) of the total of 9,547 deaths.

JUSTIFICATION FOR E-CODE GROUPINGS, BY SELECTED EXTERNAL CAUSES OF INJURY IN THE MINIMUM FRAMEWORK

Five criteria were used to define the recommended E-code groupings, including a) consistency with ICD-9 coding conventions; b) extent to which data were needed for surveillance and prevention activities at the national, state, and local levels and for international comparisons; c) assurance that E codes assigned to groupings were mutually exclusive; d) frequency of deaths assigned within specific mechanism-by-intent-of-injury categories; and e) desire to accommodate injury morbidity data by using the same matrix. The following paragraphs contain justifications based on these criteria for each recommended E-code grouping in the minimum framework for presenting injury mortality data. The number of deaths reported in each cell of the matrix was assessed by using 1993 national injury mortality data from NCHS (*1*). The number of deaths reported in the following section is from this data set, unless otherwise specified.

Category: Cut/Pierce

Number of Deaths: 3,854

E Codes: E920.0–.9, E956, E966, E974, E986

This category includes deaths caused by cutting and piercing instruments. E codes for unintentional deaths caused by cutting and piercing allow for some specification of the type of instruments or objects involved in the injury incident, including knives, swords, and daggers; power lawn mowers, power hand tools, and household appliances; and other specified and unspecified sharp objects. The codes for homicide and suicide do not permit identification of specific products. In 1993, only 3% of the cutting and piercing deaths were coded as unintentional. Thus, the specific cutting or piercing instrument used in 97% of deaths in this category cannot be identified by using E codes.

Category: Drowning

Number of Deaths: 5,059

E Codes: E830.0–.9, E832.0–.9, E910.0–.9, E954, E964, E984

This category includes deaths from drowning and submersion with and without involvement of watercraft. In 1993, a total of 13% of unintentional drownings (583 deaths [E830.0–.9; E832.0–.9]) involved boats and other types of water transport. The remaining 87% [E910.0–.9] involved drowning in seas, rivers, pools, bathtubs, and other bodies of water where no watercraft was involved. Codes for drownings identified as suicide and homicide do not specify whether watercraft was involved.

Category: Falls

Number of Deaths: 10,473

E Codes: E880.0–E886.9, E888, E957.0–.9, E968.1, E987.0–.9

This category includes deaths from falls associated with various mechanisms. Some of these E codes specify the type of fall involved. For example, within the unintentional falls category, there are E codes for falls involving steps or stairs (1,087 deaths [E880.0,.9]), ladders and scaffolds (301 deaths [E881.0,.1]), and other falls from one level to another (1,156 deaths [E884.0–.9] including 523 deaths from a chair or bed [E884.2]). Different interventions are required by different types of falls, but greater specificity can be provided by specific studies of deaths caused by falls. Of concern is the substantial number of cases (6,099 deaths [E888]) coded as "other and unspecified fall." The general code for "fracture, cause unspecified" (3,353 deaths [E887]) has been assigned to the "other" category rather than the falls category, because this E code is used for fractures when nothing is known about the cause. Greater attention to documenting the circumstances of injury is needed to reduce the substantial number of unspecified fall-related deaths and to provide more useful data for injury prevention activities.

For falls from high places, 621 deaths were coded as unintentional falls (509 deaths from a building or other structure [E882] and 112 deaths from a cliff [E884.1]), 605 suicides were coded as "jumping from high place" (E957.0–.9), 24 homicides were coded as "pushing from high place" (E968.1), and 56 deaths were coded as "falling from high place, intent undetermined" (E987.0–.9).

Determining where to assign codes for falls in, on, or from transport vehicles (e.g., boats, planes, and trains) was difficult. Although all falls could be clustered together, keeping them with transport groupings was determined to be more useful, so that prevention programs that focus on different modes of transport can account for falls.

Category: Fire/Burn

Number of Deaths: 4,547

E Codes: E890.0–E899; E924.0–.9; E958.1,.2,.7; E961; E968.0,.3; E988.1,.2,.7

This category includes deaths from fire and flames and from hot objects and substances. It does not include burns from electric current, from exposure to radiation from infrared heaters and lamps or from ultraviolet light sources (e.g., sunburn), or from explosions of combustible material. Deaths from these mechanisms are excluded from this category because E codes do not distinguish between burns and other types of injury associated with these mechanisms. Subcategories are included for fire/flame and hot object/substance injuries. These two subcategories combined represent a substantial portion of injuries traditionally treated in burn units and addressed by prevention programs.

Subcategory: Fire/Flame

Number of Deaths: 4,398

E Codes: E890.0–E899, E958.1, E968.0, E988.1

This subcategory identifies deaths caused by fire and flames, including those from smoke inhalation. Structural fires, primarily in private residences, are the major cause

of fire- and flame-related deaths. Unintentional deaths from fire and flames mostly include fires in private dwellings (3,268 deaths [E890.0–.9]), fires in other structures (68 deaths [E891.0–.9]), and clothing ignition (157 deaths [E893.0–.9]). Four deaths coded to "explosion, burning of watercraft" (E837.0–.9) were grouped with other watercraft-related deaths in the "transport, other" category. As previously mentioned, other explosion-related deaths are not included in this category. Thus, this category is considered an undercount of all deaths caused by fire and flames (*27*).

Subcategory: Hot Objects/Substances

Number of Deaths: 149

E Codes: E924.0–.9; E958.2,.7; E961; E968.3; E988.2,.7

This subcategory includes deaths caused by hot liquids and steam, caustics, and corrosives. These injuries rarely are fatal in the United States, but they account for a substantial number of emergency department visits and hospitalizations.

Category: Firearms

Number of Deaths: 39,595

E Codes: *E922.0–.9, E955.0–.4, E965.0–.4, E970, E985.0–.4*

This category includes all codes related to deaths from firearms, including unintentional, suicide, homicide, legal intervention, and undetermined intent. Firearms are a substantial cause of death across all manner/intent categories. Among all firearm-related deaths, 3.8% were coded as unintentional, 47.8% as suicide, 46.1% as homicide, 1.4% as undetermined, and 0.8% as legal intervention.

The category of deaths from firearms does not include deaths resulting from explosives. For homicide and suicide involving firearms, the fourth digit of the E code distinguishes firearms (.0–.4) from explosives (.5–.9). Intentional deaths (32 deaths [E955.5,.9, E965.5–.9]) and unintentional deaths (178 deaths [E923.0–.9] resulting from explosives are assigned to the "other specified and classifiable" category.

Although E codes permit differentiation among handguns, shotguns, hunting rifles, and military firearms, the type of firearm often is not reported. Currently, conclusions about the contribution of handguns or long guns to deaths cannot be drawn from NCHS mortality data, because most cases are coded as "other or unspecified firearm." The type of firearm was unspecified in 75% of firearm-related deaths in 1993. More specific data are needed to define the role of certain types of firearms in the injury incident (*28*).

The Department of Justice's Uniform Crime Reports database (*29,30*) provides information on firearms involved in homicides, but does not report on firearms involved in suicides or unintentional deaths from firearms. The Uniform Crime Reports database reported 24,530 murders for 1993. The type of weapon used was reported for 23,271 (94.9%) of these murders; 16,189 (70%) of these murders involved firearms, and 82% of firearm homicides involved a handgun. In contrast, NCHS mortality data (*14*) indicated 26,009 homicides and legal interventions in 1993, with 18,571 (71.4%) involving firearms. Of the 356 deaths (E970–E978) resulting from legal intervention, 318 deaths (89%) (E970) involved firearms.

Category: Machinery

Number of Deaths: 999

E Codes: E919.0–.9

This category includes injuries associated with machinery used in various industrial and occupational activities. For example, 549 deaths were associated with agricultural machinery (E919.0), 40 deaths with mining machinery (E919.1), 133 deaths with lifting machinery (E919.2), and 104 deaths with earthmoving machinery (E919.7). Although this category does not account for a substantial percentage of deaths included in 1993 U.S. mortality data, it may figure more prominently in mortality data of specific states or other countries. This category also is important for analyzing occupational mortality data.

Category: Motor Vehicle Traffic

Number of Deaths: 41,021

E Codes: E810.0–E819.9, E958.5, E988.5

This category differs from the traditional "Motor Vehicle Accident" category (E810–E825) and is designed to permit comparison of mortality data from NCHS's National Vital Statistics System (*1*) and the National Highway Traffic Safety Administration's (NHTSA) Fatality and Analysis Reporting System (FARS) (*31,32*). This category includes all deaths resulting from motor-vehicle–traffic injuries involving automobiles, vans, trucks, motorcycles, and other motorized cycles known or assumed to be traveling on public roads or highways. This category does not include E codes E820–E825, which refer to non-traffic and off-road deaths, but does include E codes E958.5 and E988.5, which refer to deaths judged to be suicide or intent undetermined. During the past decade, an average of 1,006 off-road deaths occurred per year, and an average of 44,813 deaths from motor-vehicle traffic occurred per year. Recently, an average of 100 motor-vehicle–related deaths per year have been coded as suicide or intent undetermined.

Five major subcategories identifying the deceased's involvement in the traffic-related incidents are recommended for inclusion in the minimum reporting framework. These subcategories are specified using the fourth digit of the E code, including a) **occupant** (24,586 deaths, E810–E819 [.0,.1*]): vehicle occupant as driver or passenger; b) **motorcyclist** (1,927 deaths, E810–E819 [.2,.3]): as driver or passenger; c) **pedal cyclist** (789 deaths, E810–E819[.6]): whose death resulted from a collision between a pedal cycle (e.g., bicycle) and motor vehicle in traffic; d) **pedestrian** (5,978 deaths, E810–E819[.7]): whose death resulted from being hit by a motor vehicle on a public road or highway; and e) **unspecified** (7,583 deaths, E810–E819[.9]): a death where the deceased was coded as "unspecified person." Three fourth-digit codes (i.e., .4—"occupant of streetcar," .5—"rider of animal," and .8—"other specified person") are not separated because of the minimal numbers of deaths in these categories. However, because they are included in the overall "Motor Vehicle Traffic" category, the sum of these categories can be derived by subtraction.

In 1993 in the United States, 108 motor-vehicle–related deaths were coded as suicide, and 14 were coded as intent undetermined. No specific E code exists for

*This notation implies that the decimal in brackets should be applied to each individual three-digit E code in the grouping.

homicide by motor vehicle in ICD-9 (although an E code for motor vehicle assaults [E968.5] has been added to the ICD-9-CM for coding injury morbidity data).

Presenting deaths resulting from motor-vehicle traffic in the basic mortality table will permit researchers and data analysts to bring greater specificity to tabulating the number of traffic-related deaths by using both FARS and NCHS mortality data (*1*). The ICD-9 system lacks generalized E codes for "motor vehicle occupant" and "motorcycle occupant." When it is unknown whether the deceased was the driver or passenger in a car or motorcycle, cause of death is coded with the fourth digit of the E code as "unspecified person." A total of 7,583 deaths (18.5% of all deaths from motor-vehicle traffic) in 1993 were coded as "unspecified person;" this substantial number of unspecified cases obscures the magnitude of occupant-related deaths. Because FARS uses police crash reports rather than death certificates, information obtained by using this system almost always specifies the involvement of the deceased. Thus, FARS data can be used to approximate the distribution of deaths reported as "unspecified persons" in the NCHS mortality data into motorcyclists and occupants of other motor vehicles.

NCHS and FARS national mortality data sets can be compared for persons who died from injuries caused by motor-vehicle traffic in 1993 (Table 6). For both NCHS and FARS data sets, the motor vehicle "occupant" category excludes persons on motorcycles, whereas "motorcyclist" includes drivers and passengers on motorcycles. "Other" for the NCHS data set includes occupant of streetcar, rider of animal, other specified person, and cases coded as suicide or intent undetermined. "Other" for the FARS data set means "other non-occupant."

NCHS and FARS data sets also differ for other categories. The number for deaths caused by motor-vehicle traffic in the NCHS data set is 906 higher than that reported by FARS (Table 6). This difference primarily exists because FARS includes only those deaths that occur within 30 days of the incident, whereas the NCHS vital statistics system includes all deaths from motor-vehicle traffic. In addition, ICD-9 E-coding rules for motor-vehicle–related deaths instruct the coders to default to the "traffic" codes when information is insufficient. The number of pedestrians killed in traffic-related incidents is higher in the NCHS data set than in the FARS data set (Table 4). A substantial number of injured pedestrians are elderly; thus, they are less able to survive less severe injuries and more likely to die of complications of their injuries several weeks or months after the incident. Such persons would not meet the inclusion criteria for FARS.

The percentage distributions of deaths for NCHS and FARS data sets by motor-vehicle traffic subcategories are defined by the deceased's involvement in the incident (Table 6). NCHS and FARS data differ primarily in three categories: "occupant " (59.9% in NCHS versus 77.5% in FARS), "motorcyclist " (4.7% in NCHS versus 6.1% in FARS), and "unspecified" (18.5% in NCHS versus zero in FARS).

When only specified occupants and motorcyclists are considered in both data sets, the distribution between these two categories is almost identical (for "occupant," 92.73% in NCHS versus 92.71% in FARS) (Table 6). Thus, the "unspecified" deaths in the NCHS data set can be partitioned and distributed to the "occupant" and "motorcyclist" categories based on either FARS or NCHS data. The notable undercount of deaths of motor-vehicle occupants and motorcyclists that results from using NCHS mortality data can be adjusted upward by distributing the "unspecified" deaths (Box).

TABLE 6. Number and percentage of deaths from injuries associated with motor-vehicle traffic — National Center for Health Statistics (NCHS) vital statistics system and the National Highway Traffic Safety Administration's Fatality and Analysis Reporting System (FARS), United States, 1993

		Occupant		Motorcyclist		Pedal cyclist		Pedestrian		Other		Unspecified	
	Total no.	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
NCHS	41,021	24,586	59.9	1,927	4.7	789	1.9	5,978	14.6	158	0.4	7,583	18.5
FARS	40,150	31,125	77.5	2,449	6.1	816	2.0	5,649	14.1	111	0.3	0	0
NCHS-FARS	871	-6,539		-522		-27		329		47		7,583	

Sources: NCHS. Department of Health and Human Services. Public use data tape: 1993—detail mortality file. Hyattsville, MD: National Center for Health Statistics, 1996.

National Highway Traffic Safety Administration. Traffic safety facts 1993: a compilation of motor vehicle crash data from the Fatality and Analysis Reporting System (FARS) and the General Estimates System. Washington, DC: US Department of Transportation, October 1994.

BOX. Method of adjusting for an undercount of deaths of motor-vehicle occupants and motorcyclists

Multiply the number of "unspecified" deaths in the NCHS data set (n=7,583) by the proportions drawn from FARS or NCHS (7,583 x 92.71%=7,030 for occupants; 7,583 x 7.29%=553 for motorcyclists) and add that to the NCHS number (7,030 + 24,586 = 31,616 for occupants; 553 + 1,927=2,480 for motorcyclists). This method results in an overestimate of 491 occupants and 31 motorcyclists when compared with FARS, but it is more accurate than the 6,539 and 522 undercount for NCHS versus FARS, respectively, by not accounting for the "unspecified" cases. This overestimate is expected, because the NCHS data set is more comprehensive.

When presenting NCHS data concerning deaths from motor-vehicle traffic for age-specific groups, the "unspecified" deaths can be distributed based on the distribution of deaths in the NCHS mortality data for each respective age-specific group. For instance, "unspecified" deaths were distributed across the occupant and motorcyclist categories based on the age-specific distributions of deaths where the injured person was specified in the 1993 NCHS mortality data file (*1*). The results suggest that in 1993, the traffic-related death rate among motor-vehicle occupants was higher for persons aged 15–24 years and for those aged ≥75 years than for persons in other age groups (Table 7). The death rate among motorcyclists was highest among persons aged 20–24 years (Table 7). If other demographic variables (e.g., sex and race) are used, the distribution of the number of deaths should be specified within subgroups (e.g., sex- and race-specific).

Category: Pedal Cyclist, Other

Number of Deaths: 116

E Codes: E800–E807 (.3), E820–E825 (.6), E826.1,.9

This category includes all deaths among pedal cyclists not involving motor-vehicle traffic incidents. It includes persons hit by a train (11 deaths [E800–E807 (.3)]) or by a motor vehicle while not in traffic (one death [E820–E825 (.3)]), hit by other means of transport (one death [E827–E829 (.1)], and killed by a collision with another pedal cycle or by another mishap (97 deaths [E826.1,.9]). The total number of persons whose death can be attributed to pedal cyclist-related incidents can be computed by adding cases in the "Motor Vehicle Traffic: Pedal Cyclist" and "Pedal Cyclist, Other" categories.

This category is intended to include only deaths to pedal cycle riders, not all deaths involving a pedal cycle. The codes (E826.2–.8) that specify that the deceased was not the pedal cyclist or a pedestrian have been assigned to the "Transportation: Other" category. In 1993, this included one person, a "rider of an animal." Deaths coded as E826.9, where the person injured was "unspecified," were included in this category because of the high likelihood that the deceased was a pedal cyclist. In 1993, only six cases were coded as E826.9. However, better documentation about the role of the deceased in the pedal cycle incident is needed from the death investigation to minimize the number of unspecified deaths.

TABLE 7. Number of deaths and crude death rates per 100,000 population for unintentional motor vehicle (MV) traffic-related incidents, by person injured and age — United States, 1993

Mechanism	All ages*	Age of decedent (yrs)												
		<1	1–4	5–9	10–14	15–19	20–24	25–34	35–44	45–54	55–64	65–74	75–84	≥85
		Number												
MV traffic†	40,899	183	756	838	1,046	4,876	5,470	8,030	5,957	3,719	2,834	3,051	3,124	982
Occupant§	31,618	172	449	430	600	4,261	4,442	6,169	4,391	2,842	2,220	2,428	2,467	739
Motorcyclist§	2,478	0	1	6	39	244	612	748	498	197	70	35	24	4
Pedal cyclist, other	789	0	12	94	157	89	51	130	101	53	40	42	12	7
Pedestrian, other	5,978	11	291	308	248	276	359	980	964	624	499	543	619	232
		Rate												
MV traffic†	15.9	4.7	4.8	4.5	5.6	28.2	29.2	19.2	14.6	13.0	13.5	16.4	29.1	28.8
Occupant§	12.3	4.4	2.8	2.3	3.2	24.7	23.7	14.7	10.8	9.9	10.6	13.0	23.0	21.6
Motorcyclist§	1.0	—¶	—	—	0.2	1.4	3.3	1.8	1.2	0.7	0.3	0.2	0.2	—
Pedal cyclist, other	0.3	—	—	0.5	0.8	0.5	0.3	0.3	0.2	0.2	0.2	0.2	—	—
Pedestrian, other	2.3	—	1.8	1.7	1.3	1.6	1.9	2.3	2.4	2.2	2.4	2.9	5.8	6.8

* Includes deaths from injuries in which the age of the decedent was unknown.
† Includes other specified persons.
§ Includes deaths where the injured person was "unspecified." These deaths were distributed into occupant and motorcyclist subcategories based on the proportion of deaths in these subcategories by age group in the 1993 National Center for Health Statistics (NCHS) mortality data file.
¶ Rates are unreliable because they are based on <20 deaths.

Sources: NCHS. Department of Health and Human Services. Public use data tape: 1993—detail mortality file. Hyattsville, MD: National Center for Health Statistics, 1996.

US Bureau of Census. U.S. population estimates by age, sex, race, and Hispanic origin: 1993. Census file RESPO793, 1995.

Category: Pedestrian, Other

Number of Deaths: 941

E Codes: E800–E807 (.2), E820–E825 (.7), E826–E829 (.0)

This category includes codes for pedestrians hit by a train (533 deaths [E805.2]), a motor vehicle where the collision did not occur in traffic (i.e., on a public road or highway) (395 deaths [E820–E825 (.7)]), or another means of transportation (10 deaths [E826–E829 (.0)]). For the latter two categories, 374 of the 405 deaths were coded as "other motor-vehicle non-traffic accident involving collision with a moving object (pedestrian)" (E822.7). Many of these fatal incidents involved a person (often a child aged <5 years) hit by a motor vehicle while not on a public street, road, or highway. Common locations for such incidents include private driveways and parking lots. The total number of deaths of pedestrians can be obtained by adding the number of cases in the "Motor-Vehicle Traffic: Pedestrian" and "Pedestrian, Other" categories.

More than half of the deaths in the "Pedestrian, Other" category involve railway trains and not motor vehicles, to which most traditional pedestrian categories have referred. For persons concerned with monitoring railway-related deaths, deaths of pedestrians (536 deaths [E800–E807(.2)] should be considered along with all other railway-related deaths assigned to the "Transport, Other" category.

Category: Transport, Other

Number of Deaths: 1,829

E Codes: E800–E807(.0,.1,.8,.9), E820–E825(.0–.5, .8,.9), E826.2–.8, E827–E829(.2–.9), E831.0–.9, E833.0–E845.9

This category includes deaths associated with various other means of transportation: railway (123 deaths [E800–E807 (.0,.1,.8,.9)]), off-road and other motor vehicles not in traffic (592 deaths [E820–E825 (.0–.5, .8–.9)]), other surface transport (74 deaths [E827–829(.2–.9)]), water (180 deaths [E831.0–.9, E833.0–E838.9], and aircraft (859 deaths [E840.0–844.9]). Some specific circumstances associated with these means of transport (e.g., streetcars and horse-and-carriages) have been assigned to other categories. For example, drowning associated with boats was assigned to "Drowning/Submersion," and pedal cyclists and pedestrians hit by trains (536 pedestrians and 11 pedal cyclists) were assigned to "Pedal Cyclists, Other" and "Pedestrian, Other," respectively.

Category: Natural/Environmental Factors

Number of Deaths: 1,559

E Codes: E900.0–E909, E928.0–.2, E958.3, E988.3

This category combines several distinct factors. The number of deaths in this category varies substantially, depending on the extent of adverse environmental conditions. In 1993, a total of 299 deaths were caused by excessive heat (E900.0–.9), 641 deaths were caused by excessive cold (E901.0–.9), 123 deaths were caused by hunger (E904.1), and 106 deaths resulted from excessive exposure to weather conditions [E904.3]. In addition, 96 deaths were associated with cataclysmic storms (e.g., tornados, floods, and hurricanes) (E908), and 17 deaths were associated with cataclysmic land movement (e.g., earthquakes, land slides, avalanches, and tidal waves) (E909). Deaths caused by bites and stings also are included as a subcategory.

Subcategory: Bites and Stings

Number of Deaths: 89

E Codes: E905.0–.6,.9; E906.0–.4,.9

This subcategory includes deaths from bites and stings of venomous and nonvenomous insects and other animals. For example, 39 deaths resulted from stings from hornets, wasps, and bees (E905.3), and 20 deaths were caused by dog bites (E906.0). Although these injuries rarely are fatal, they result in a substantial number of visits to hospital emergency departments.

Category: Overexertion

Number of Deaths: 19

E Code: E927

This category contains injuries that rarely are fatal (19 deaths in 1993). However, many persons with injuries caused by overexertion are either treated in emergency departments, hospitalized, or both.

Category: Poisoning

Number of Deaths: 15,770

E Codes: E850.0–E869.9, E950.0–E952.9, E962.0–.9, E972, E980.0–E982.9

The proposed basic matrix aggregates all codes referring to poisoning without differentiating among specific agents. However, E codes exist for specific agents. Drugs and other medicinal substances accounted for 78% and gases accounted for 18% of all deaths resulting from poisoning. Among the 12,133 deaths attributed to drugs and other medicinal substances (E850.0–E858.9, E950.0–.5, E962.0, E980.0–.5), 14% (1,742 deaths) were coded as intent undetermined (E980.0–.5). The other deaths involving drugs were distributed as follows: 7,382 deaths were coded as unintentional (E850.0–E858.9), 2,975 deaths as suicide (E950.0–.5), and 34 deaths as homicide (E962.0). Among deaths involving gases, 646 deaths were coded as unintentional (E868.0–E869.9), 2,092 deaths were coded as suicide (E951.0–E952.9), and 107 deaths were coded as intent undetermined (E981.0–E982.9). Other substances involved in unintentional poisoning were alcohol (337 deaths [E860.0–.9]); disinfectants, cleansers, paints, and lubricants (70 deaths [E861.0–E862.9]); insecticides, herbicides, fungicides, and fumigants (16 deaths [E863.0–.9]); corrosives and caustics (13 deaths [E864.0–.4]); and food (five deaths [E865.0–.9]). The category for poisoning does not include the 201 deaths resulting from "drugs, medicinal, and biological substances causing adverse effects in therapeutic use (E930.0–E949.9)," which are assigned to the "Adverse Effects" category.

Category: Struck By/Against

Number of Deaths: 1,273

E Codes: E916–E917.9, E960.0, E968.2, E973, E975

This category includes injuries resulting from being struck by or striking against objects or persons. Although E codes exist for unintentional injury and assault, self-inflicted or "intent undetermined" deaths have no specific E codes. The E codes for unintentional injuries specify being struck accidentally by a falling object (714 deaths

[E916]) and striking against or being struck accidentally by objects or persons (187 deaths [E917.0–.9]), including 42 deaths coded as being associated with sports [E917.0]. The E codes for homicide include being struck by a blunt or thrown object (279 deaths [E968.2]) and injuries sustained in an unarmed fight or brawl (89 deaths [E960.0]).

Consideration was given to including E codes associated with intentionally jumping or lying before a moving object (278 deaths [E958.0]), assuming that the damage results from being struck by the moving object. However, this code was not included because it is used primarily for suicide attempts caused by a person stepping in front of moving transport (e.g., trains, subways, and cars). These E codes have been assigned to the "Other Specified and Classifiable" category.

Category: Suffocation

Number of Deaths: 9,835

E Codes: E911–E913.9, E953.0–.9, E963, E983.0–.9

This category represents two major ways in which suffocation causes deaths: a) by the inhalation or ingestion of food or other objects that block respiration and b) by other mechanical means that hinder breathing (e.g., plastic bag over nose or mouth, suffocation by bedding, and unintentional or intentional hanging or strangulation). Food and other objects blocking respiration accounted for 3,160 deaths (E911–E912), or 76% of the unintentional deaths resulting from suffocation. Eighty-four percent of the suffocation-related suicides (3,886 deaths [E953.0]) were caused by hanging.

Category: Other Specified and Classifiable

Number of Deaths: 2,353

E Codes: see Table 3

This category contains the codes for causes of injury death that are not assigned to specific categories within the matrix. For unintentional injury, this category includes mechanisms such as foreign body entering orifice (22 deaths [E915]); caught accidentally in or between objects (91 deaths [E918]); explosions (227 deaths [E921.0–.9, E923.0–.9]); and electric current (548 deaths [E925.0–.9]). This category also contains codes for the late effects of specific unintentional injury, including motor vehicle (385 deaths [E929.0]), other transport (11 deaths [E929.1]), poisoning (12 deaths [E929.2]), falls (272 deaths [E929.3]), fire (two deaths [E929.4]), and natural and environmental factors (15 deaths [E929.5]). These deaths were placed in this grouping to separate them from the acute events and because there were no comparable late-effects E codes for specific mechanisms of intentional injury.

For suicide, 278 deaths were associated with a person intentionally jumping in front of a moving object (E958.0), as distinguished from a "fall" or "struck by/against." For homicide, this category includes rape (six deaths [E960.1]), child battering (311 deaths [E967.0–.9]), explosives (18 deaths [E965.5–.9]), and criminal neglect (28 deaths [E968.4]). For other causes of violence, 30 deaths were associated with legal execution [E978]).

Category: Other Specified, Not Elsewhere Classifiable

Number of Deaths: 1,449

E Codes: see Table 3

This category contains codes for mechanisms of injury that have been reported on the death certificate but for which no specified E codes exist. The largest contributor to this category is "assault by other specified means" (932 deaths [E968.8]). This category contains other late-effects codes, including other specific unintentional injury (90 deaths [E929.8]), self-inflicted (43 deaths [E959]), assault (161 deaths [E969]), and injuries of undetermined intent (26 deaths [E989]).

Category: Unspecified

Number of Deaths: 7,444

E Codes: see Table 3

This category contains codes to accommodate cases where the mechanisms are not reported on the death certificate. In some instances, categorizing a death as "unspecified" is appropriate. The largest contributors to this category are "fracture, cause unspecified" (3,353 deaths [E887]), "unspecified accidents" (2,477 deaths [E928.9]), "late effects of unspecified accidents" (233 deaths [E929.9]), and "assault by unspecified means" (1,056 deaths [E968.9]). Persons who provide data (e.g., coroners and medical examiners) should strive to be more specific in reporting causes of death and injury.

Category: Adverse Effects

Number of Deaths: 2,925

E Codes: E870–E879, E930.0–E949.9

This category includes a series of codes clustered under "misadventures to patients during surgical and medical care" (418 deaths [E870.0–E876.9]), "surgical and medical procedures as the cause of abnormal reaction of patient or later complication, without mention of misadventure at the time of procedure" (2,306 deaths [E878.0–E879.9]), and "drugs and medicinal and biological substances causing adverse effects in therapeutic use" (201 deaths [E930.0–E949.9]). Adverse effects are separated from other external causes of injury and are not included in the calculation of injury deaths and death rates.

CONCLUSIONS

Public health professionals and researchers are encouraged to adopt the recommended framework for presenting injury mortality data to supplement the traditional tabulations of vital statistics mortality data. This framework can provide the basis for comparison of national and state injury-mortality statistics for use in identifying external causes of injury death needing priority public health attention in jurisdictions. The process of developing the recommended framework has involved the participation of federal, state, private, and professional organizations. Future efforts, using a similar process, will be directed to refine the framework, to develop recommendations for presenting injury-morbidity data, and to prepare for the transition involved in implementing and presenting mortality and morbidity data using the tenth revision of the

International Classification of Diseases' (ICD-10) and the ICD-10 Clinical Modifications' external causes of injury and poisoning codes.

Acknowledgements

We thank Dr. Joe Sniezek and Mr. Hank Weiss for their expert consultation and for early contributions in this effort to develop a framework for presenting injury data, Ms. Helen Jakimenko for her helpful clerical support, and Ms. Rachel Wilson for her editorial expertise in preparing the final version of this report for publication.

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