The State of Home Safety in America™

Facts About Unintentional Injuries in the Home

Second Edition
2004

HOME
SAFETY
COUNCIL™

A safe home is in your hands.

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Editors

Carol W. Runyan, MPH, PhD
Carri Casteel, MPH, PhD

The Home Safety Council is a 501(c)(3) nonprofit organization dedicated to helping prevent the nearly 21 million medical visits that result on average each year from unintentional injuries in the home. Through national programs and partners across America, the Home Safety Council works to educate and empower families to take actions that help keep them safer in and around their homes. To learn more about the Council's programs, partnerships and resources, visit the Home Safety Council at **www.homesafetycouncil.org**.

This is the second edition of *The State of Home Safety in America*™. In the first edition, published in 2002, we provided the framework for this follow-up work. The first edition contained analyses of several data sources to examine morbidity, mortality and costs associated with unintentional injuries in U.S. homes. In addition, it reported the results of a national telephone survey with 1,003 households to learn about home hazards and safety practices. This second edition provides updated information about mortality, morbidity and costs, including documentation of trends in rates over time. We have reprinted the information from the 2002 household survey as it appeared in the earlier edition.

The work for this edition was completed by teams of researchers at the University of North Carolina Injury Prevention Research Center and at the Pacific Institute for Research and Evaluation. Contributors from within each organization are listed on the next page.

Questions or Comments

Questions or comments about the data or statistics used in *The State of Home Safety in America*™ should be directed to the University of North Carolina Injury Prevention Research Center (UNC IPRC) Home Safety Council Liaison Office at (919) 966-2251 or iprc@unc.edu. All other questions or comments should be directed to the Home Safety Council at **info@homesafetycouncil.org**. You may also visit the Home Safety Council on the Web at **www.homesafetycouncil.org** and the UNC IPRC at **www.sph.unc.edu/iprc**.

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Acknowledgments

A Message from the Home Safety Council

Dear Friends:

The State of Home Safety in America™ was first published in 2002 and represented an unprecedented collection of data about our nation's quiet crisis: unintentional home injuries. This second edition of the report is a continuation of our important collaboration with the respected University of North Carolina Injury Prevention Research Center (IPRC).

This unique data compilation informs the Home Safety Council's strategic decisions, outreach efforts and educational program development. It is a useful guide for creating and amending safety education messages and is a most worthy and trusted tool.

**Meri-K Appy, President
Home Safety Council**

As just two examples of the ways in which the data supports our work nationally, we are commencing two new projects to reach populations at high risk of home injury.
The first new effort addresses the challenge of older adult falls at home. The other teams literacy providers with local fire departments to teach basic home fire safety to Americans with low literacy skills.

Today the Home Safety Council is well armed to lead an ambitious and strategic pursuit of worthwhile national partnerships to improve the state of home safety in our country.

Since we published the inaugural edition of *The State of Home Safety in America*, the Home Safety Council has grown and evolved in important ways. Though our mission has remained the same – empowering families to take actions that help keep them safer in and around their homes – we've made several key changes that will shape the ways in which we pursue that mission in the future. Updating this report is just one of them. Let me share a few others:

- Today we are an independent, 501(c)(3) organization, now welcoming the active support of outside financial underwriting for our national educational programs and activities.

- We've moved the Council headquarters to Washington, D.C., where we now readily participate in legislative and public policy activities, and work closely with federal agencies and other national safety groups.

- We have undertaken a complete redesign of our logo identity, which now more effectively conveys our belief that a safer home is within everyone's grasp.

- And we've greatly expanded our interactive Web site (www.homesafetycouncil.org), which encompasses a dynamic and comprehensive home safety venue serving diverse audiences.

As you read the pages of this second edition, you will see why the Council's determined effort is essential. Unintentional home injuries are a costly and debilitating national crisis. Complicating the problem is the shadow in which this expensive, damaging, and life-threatening burden exists.

Yet the vast majority of these home injuries are preventable, most often through changes in environments and human behavior. With that encouraging prospect in mind, we have embraced a compelling message we hope all will remember: *A safe home is in your hands*.

We stand able and eager to lead the way to greater home safety, through knowledge, collaboration and active outreach. We look forward to having your support.

Meri-K Appy

President

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Executive Summary

This is the second edition of *The State of Home Safety in America™*, a report commissioned by the Home Safety Council. The purpose of the report is to document the (a) occurrence of fatal and nonfatal unintentional home injury in America, (b) societal costs associated with home injury, and (c) safety issues and protective practices associated with injury at home. Though violence is an important problem that occurs in the home environment, we only focus in this report on unintentional injuries, and therefore do not address suicide, homicide, family violence or any other form of assault.

As in the first edition, we used three broad approaches in creating the report. One involved analyses of existing data from national datasets to document fatal and nonfatal injuries occurring at home. The second approach involved computations to generate cost estimates associated with both fatal and nonfatal injuries. Third, we repeat the findings from a 2002 national random digit dial survey of 1,003 households in which the prevalence of major home hazards and protective practices were examined. This edition extends the earlier analyses by documenting the trends in injury rates over multiple years and organizes the information according to age groups and major types of injuries.

The purpose of this *Executive Summary* is to highlight major findings in the report and make recommendations about what types of actions are required.

Data Issues

Our ability to understand the issue of home safety, or any health concern, is dependent on the quality of the data available. As noted in our first edition of this report, the data available to understand patterns of injury in the home environment have major limitations. No data from hospitalizations are included here because these data do not differentiate those injuries occurring at home from those occurring in other locations. Likewise, for deaths, the location of injury is frequently missing.

There are substantial gaps in the information available from national datasets. For example:

- For one-third of all non-transportation deaths due to injury, the location of injury is unknown or not recorded.
- There is no single source from which to identify the prevalence of all nonfatal injuries at home.
- Data sources use varying definitions of "home" and do not have complete information about the location at which injuries occur.

Despite the gaps in the data noted above, there is still much that can be understood about injury at home and what needs to be done to prevent these injuries. The numbers presented in this report represent the minimum number of deaths and injuries, and the corresponding costs, that occur in U.S. homes. The true magnitude of the problem is even greater.

The Home Injury Problem

A. Unintentional Home Injuries – Overall

■ Between 1992 and 1999, on average, there were approximately 18,000 deaths per year, representing a rate of 6.83 deaths for every 100,000 persons in the United States, or approximately 20 percent of all deaths due to injury **(Table 1)**.

■ The leading causes of home injury death between 1992 and 1999 were falls and poisonings, accounting for averages of 5,961 and 4,833 deaths each year, respectively **(Table 1)**.

■ Older adults, both men and women, experienced the highest rates of unintentional home injury death among all age groups, with persons at least 80 years of age experiencing injury deaths at rates more than 20 times greater than their younger counterparts **(Figure 1)**.

■ Average annual death rates due to unintentional home injuries between 1992 and 1999 varied widely by state,

Table 1. Unintentional Home Injury Deaths. Average Annual Number, Percentage and Rate (per 100,000 persons), All Causes, U.S., 1992-1999.

Cause of Death	Number	Percentage	Rate
Fall	5,961	33.0	2.25
Poisoning	4,833	26.8	1.83
Fire/Burn	3,402	18.8	1.29
Choking/Suffocation	1,092	6.1	0.41
Drowning/Submersion	823	4.6	0.31
Firearm	590	3.3	0.22
Natural/Environmental	427	2.4	0.16
Struck By/Against	285	1.6	0.11
Miscellaneous	230	1.3	0.09
Unspecified	215	1.2	0.08
Machinery	127	0.7	0.05
Cut/Pierce	60	0.3	0.02
Overexertion	3	<0.1	<0.01
Motor Vehicle	0	0.0	0.00
Pedal Cyclist, Other	0	0.0	0.00
Pedestrian, Other	0	0.0	0.00
Transport, Other	0	0.0	0.00
TOTAL	18,048	100.0	6.83

Data Source: National Vital Statistics System, 1992-1999.

with a four-fold difference between the states having the highest (New Mexico, 13.03 deaths per 100,000 persons) and lowest (Massachusetts, 3.33 deaths per 100,000 persons) rates.

■ Falls were the leading cause of unintentional home injury death in the majority of states.

■ Males experienced substantially more fatal unintentional injuries at home than females **(Figure 1)**. However, females experienced slightly more nonfatal home injuries than males. Males and females used emergency department care for home injuries at about the same rate.

Figure 1. Unintentional Home Injury Deaths. Average Annual Rate (per 100,000 persons), by Age Group and Sex, U.S., 1992-1999.

Data Source: National Vital Statistics System, 1992-1999.

- Between 1997 and 2001, an average of 12 million nonfatal unintentional home injuries were reported each year. Falls accounted for the majority of the injuries (5.1 million) **(Table 2)**.

- After falls, the most commonly reported nonfatal unintentional injuries were those associated with being struck by or against something (an average of nearly 1.5 million injuries annually) and being cut or pierced by a sharp object (an average of nearly 1.4 million injuries annually) **(Table 2)**.

- Approximately 10 million unintentional home injuries were seen in U.S. emergency departments annually between 1993 and 2000 **(Table 3)**.

- Falls were the leading cause of emergency department visits for unintentional injuries occurring at home, accounting for about 3.8 million emergency department visits each year between 1993 and 2000 **(Table 3)**.

- Between 1996 and 2000, an annual average of nearly 21 million medical visits were made due to home injuries — 10 million to a hospital emergency department and another 11 million to a private physician's office.

Table 2. Nonfatal Unintentional Home Injuries. Average Annual Number, Percentage and Rate (per 100,000 persons), All Causes, U.S., 1997-2001.

Cause of Injury	Number	Percentage	Rate
Fall	5,105,558	41.2	1,884.0
Struck By/Against	1,467,203	11.8	541.4
Cut/Pierce	1,398,434	11.3	515.7
Overexertion	1,262,619	10.2	466.2
Poisoning	726,296	5.9	263.9
Natural/Environmental	580,343	4.7	213.4
Miscellaneous	560,903	4.5	206.0
Unspecified	464,922	3.8	171.9
Fire/Burn	261,326	2.1	96.4
Pedal Cyclist, Other	169,530	1.4	62.5
Transport, Other	139,856	1.1	51.4
Machinery	122,373	1.0	45.2
Motor Vehicle	81,902	0.7	30.3
Pedestrian, Other	21,974	0.2	8.2
Choking/Suffocation	18,101	0.1	6.7
Firearm	12,144	0.1	4.5
Near-Drowning/Submersion	2,380	<0.1	0.9
TOTAL	12,395,864	100.0	4,410.0

Data Source: National Health Interview Survey, 1997-2001.

Table 3. Nonfatal Unintentional Home Injuries Resulting in Emergency Department Visits. Average Annual Number, Percentage and Rate (per 100,000 persons), All Causes, U.S., 1993-2000.

Cause of Injury	Number	Percentage	Rate
Fall	3,838,230	38.2	1,444.3
Struck By/Against	1,655,812	16.5	622.4
Cut/Pierce	1,418,671	14.1	534.0
Miscellaneous	716,061	7.1	269.7
Natural/Environmental	533,731	5.3	201.0
Overexertion	484,634	4.8	182.3
Unspecified	422,508	4.2	159.2
Fire/Burn	304,434	3.0	114.8
Poisoning	236,244	2.3	88.5
Pedal Cyclist, Other	112,709	1.1	42.6
Transport, Other	109,701	1.1	41.1
Machinery	90,341	0.9	33.9
Motor Vehicle	67,694	0.7	25.4
Choking/Suffocation	36,806	0.4	13.9
Firearm	18,375	0.2	7.0
Near-Drowning/Submersion	7,171	0.1	2.7
Pedestrian, Other	7,043	0.1	2.6
TOTAL	10,060,165	100.0	3,785.3

Data Source: National Hospital Ambulatory Medical Care Survey – Emergency Department, 1993-2000.

- Unintentional home injuries cost society an average of at least $222 billion each year in medical costs between 1997 and 2001, with an additional $165 billion in medical costs from injuries that possibly occur in the home **(Table 4)**.

- Medical costs due to unintentional injuries known to occur at home ($222 billion) were far greater than costs from other types of injury, including violence ($98 billion) or suicidal acts ($96 billion), between 1997 and 2001 **(Table 4)**.

Table 4. Cost of Injury by Cause and the Portion Resulting from Home Injury, U.S., 1997-2001 (inflation-adjusted to year 2000 dollars, in billions of dollars).

Cause	1997	1998	1999	2000	2001	Average across all years
Unintentional Definitely at Home	252	214	195	214	231	222
Unintentional Possibly at Home	211	165	126	137	187	165
Motor Vehicle	277	258	251	230	238	251
Suicide Acts	96	100	91	95	98	96
Violence	109	101	97	87	95	98
Other Unintentional	257	375	435	346	311	345
TOTAL ($, billions)	1,203	1,213	1,194	1,109	1,161	1,176

Data Sources: National Vital Statistics System; National Hospital Discharge Survey; National Health Interview Survey; National Electronic Injury Surveillance System - All Injury Program.

B. Specific Injury Types

Falls

- Falls were the leading cause of unintentional injury in the home environment, resulting in an average of 5,961 deaths each year between 1992 and 1999.

- Falls accounted for one-third of all unintentional home injury deaths (1992 – 1999), more than 40 percent of nonfatal unintentional injuries (1997 – 2001), and more than one-third of all nonfatal home injuries resulting in emergency department care (1993 – 2000).

- The rates and national estimates of the number of fall deaths were substantially higher among those at least 70 years of age, compared to all other age groups.

- The circumstances surrounding the majority of fall deaths (63%) were unknown.

- Seventeen percent of fall deaths were associated with stairs or steps.

Poisoning

- Poisonings were the second leading cause of home injury fatality, resulting in approximately one-fourth of all home injury deaths, or an average of 4,833 per year.

- More than half of all poisoning deaths for which the location is known occurred in the home. However, location was unknown for one-third of the total number of deaths.

- The highest rates of poisoning deaths were among males age 30-49.

- Nearly one-fourth of poisoning deaths were associated with heroin. Additionally, 22 percent of poisoning deaths were related to central appetite depressants (i.e., drugs used primarily for weight loss).

- Poisoning fatality rates, particularly for adult males, increased between 1992 and 1999.

- An average of 726,296 nonfatal poisoning events occurred in the home annually in the U.S between 2000 and 2001.

- Rates of nonfatal poisoning were significantly higher for children younger than five years of age, compared to all other age groups.

Fires and Burns

- Fires and burns were the third leading cause of home injury death, accounting for an average of 3,402 deaths per year between 1992 and 1999.

- Of all fire and burn-related injuries, 90 percent of the fatalities and 57 percent of nonfatal injuries occurred in the home.

- The rates of fire and burn fatalities were highest among older adults (60+) followed by children younger than five.

- Rates of fire and burn fatalities decreased in the period between 1992 and 1999.

- Nonfatal injury rates decreased most dramatically for children younger than age five between 1997 and 2001.

Choking and Suffocation

- Deaths from choking and suffocation ranked fourth among unintentional home injury fatalities, resulting in an average of 1,092 deaths annually, from 1992 to 1999.

- One-fourth of all choking and suffocation deaths occurred at home.

- One-third of the home fatalities due to choking or suffocation were associated with food, while 16 percent were the result of suffocations in beds or bedding.

- The highest death rates due to choking and suffocation were among children less than five years of age and adults 70 and older.

- Nonfatal choking events resulted in an average of nearly 37,000 visits to emergency departments annually between 1993 and 2000.

Drownings and Submersions

- Though the majority of drownings occurred in places other than the home, drownings were the fifth leading cause of unintentional home injury death, resulting in an average of 823 deaths per year, from 1992 to 1999.

- At least one-third of the unintentional home drownings occurred in bathtubs.

- There were an average of 7,171 near drownings in the home environment resulting in emergency department care each year between 1993 and 2000.

- Overall rates of drowning at home have not changed much in recent years.

- Males had higher drowning rates than females, and children younger than five had the highest rates of all age groups.

C. High-Risk Age Groups

- Children and older adults are the two most vulnerable groups for most types of unintentional home injury.

- On average, 2,097 children younger than age 15 died as a result of unintentional injuries at home each year from 1992 to 1999.

- Infants (younger than age 1) had the highest rate of unintentional home injury deaths of all children younger than age 15, largely due to choking and suffocation injuries.

- For infants, choking and suffocation was the leading cause of home injury fatality.

- For children 1-14 years of age, the largest number of fatalities at home were due to fires and burns.

- Falls were by far the leading cause of nonfatal home injury for children from birth through age 14.

- Among adults aged 65 or older, falls were the leading cause of home injury death, followed by fires and burns.

- Falls were the leading cause of nonfatal injuries occurring at home among older populations, accounting for significantly more visits to emergency departments than any other type of injury in this age group.

The State of Home Safety in America — 2002 Survey

In this edition, we have reprinted information reported in the first edition of *The State of Home Safety in America*™ (2002). Obtained via a national telephone survey of households, we reported a great deal of information about the prevalence of home hazards and protective practices, especially those issues and practices related to falls, poisoning, fires/burns and firearm injuries.

Falls

■ One-third of all households with stairs did not have banisters or handrails on at least one set of stairs. Homes with older persons were more likely to have banisters or handrails than those where young children lived or visited.

■ Forty-eight percent of households had windows at a second-floor level or above, yet of those, only one-fourth reported that they had window locks or safety guards to prevent children from falling out.

■ Sixty-three percent of U.S. households used bathtub mats or non-skid strips to help reduce bath tub falls. Those products were also present in 79 percent of older adult (70 and older) households. Only 19 percent of homes had grab bars to supplement their non-skid tub surfaces.

Poisoning

■ In those homes where children (younger than six) lived or visited at least once a year, 33 percent of respondents reported keeping medicines in an easily accessible location, such as on a table, shelf or countertop. Eighty-two percent reported keeping medicines in an unlocked drawer or cabinet and 42 percent in a purse.

■ More than two-thirds (69%) of the homes with young children reported that household chemicals (e.g., cleaners, bleach or kerosene) were stored in unlocked places.

Fires and Burns

■ Ninety percent of U.S. households reported having at least one smoke alarm, and 80 percent had one on each level.

■ Only 20 percent of households with at least one smoke alarm tested them at least once every three months.

■ Seventy-five percent of respondents did not know the temperature of the setting on their water heaters, and 91 percent were unaware of the temperature of hot water at the tap, thus risking scald injuries.

Firearms

■ Among homes with firearms (31%), 46 percent reported keeping them in a lockbox or locked cabinet, and 28 percent reported using gun locks.

■ Forty-nine percent of gun-owning homes where young children lived or visited reported storing all of their guns in a locked place, and 32 percent reported using gun locks.

Major Implications of the Report

Even though there are significant gaps in the available data used to understand and monitor the problem of home injury and document changes associated with interventions, we are confident in saying that the problem is large. The numbers of deaths and injuries reported in this document do not represent the full magnitude of the problem.

Improving home safety will require several kinds of approaches and partnerships among different groups. First, to continue to improve our understanding of the problem, we need to be working toward better data systems and ensuring that the locations at which injuries take place are identified and recorded in a consistent manner. Also, databases should be restructured to collect information more useful in designing preventive initiatives; in particular, they should document more fully the circumstances and location of injury.

Better data will help propel the development of the kinds of multi-pronged approaches needed to work on preventing these injuries. These approaches must rely on expertise and skills of many types of professionals, including the following: those in the health fields who prevent or treat home injury; engineers and architects who design products and homes; fire and rescue personnel who deliver critical advice and services to enhance home safety; those in private businesses and in government who make decisions about regulations and marketing of products; and, those who establish and enforce laws associated with safety. In addition, the media, educational, and legal institutions are critical to help establish a culture of safety that: (1) maintains awareness of the risk of unintentional injuries in the home, as well as the opportunities for the prevention of these injuries, and (2) establishes social and legal norms conducive to and consistent with safety.

It should also be remembered that this report only deals with unintentional injury. There are also significant issues in home safety associated with suicide, child maltreatment, violence against women and other forms of assault.

Recommendations

Unfortunately, because of limited data, too little is known about unintentional injury at home to recommend specific intervention strategies. The following recommendations call for a broad, multiorganizational agenda to set the foundation for addressing the problem of home injury. Stated simply, what is needed is a carefully constructed plan that maximizes the potential impact of resources by selecting approaches to prevention that are based on comprehensive data and sound evidence of effectiveness. To this end, we should be devoting our attention to the problems and approaches where there is the most chance of reducing death and injury. In the meantime, we should be developing better data and evaluating new intervention ideas based on sound evidence and/or theories about prevention. All of these activities require funding and recognition that resources are directly related to the quality of the program and the ability to detect changes. Without sufficient investment in funding high quality evaluations, we will not be able to make wise decisions about the use of other funds to facilitate progress in reducing injury. Specific recommendations follow.

1. **Multiple organizations should commit to a collaborative national effort to address the home safety problem.**

   Critical players include the Home Safety Council, CDC's National Center for Injury Prevention and Control, the National Association of Injury Control Research Centers, the National Center for Health Statistics, the U.S. Consumer Product Safety Commission, the State and Territorial Injury Prevention Directors' Association, as well as other private and public agencies and organizations that address specific injury problems. In part, this requires: a commitment to regular, updated analyses of existing national data to examine trends in injury patterns nationwide; the administration of surveys to document changes in home environments and safety practices; and, periodic, careful review of the literature pertinent to home safety. These groups must also work together to raise awareness of the problem of home injuries as part of the broader injury problem, encouraging public attention to the issue and advocating for the allocation of adequate resources to address the problem.

2. **Congress should allocate increased resources to support injury prevention efforts.**

   Compared to funding for cancer and cardiovascular disease prevention and relative to the magnitude of the injury problem, resources to address injury prevention are grossly insufficient. If progress is to be made, there must be equitable distribution of funds so as to enable support for high quality research and programs, as well as careful evaluations that are commensurate with the magnitude of the problem, relative to other health problems.

3. **Federal agencies responsible for injury data should examine how to improve the quality and completeness of data about injury in the home environment.**

   Federal agencies, including the CDC's National Center for Injury Prevention and Control and National Center for Health Statistics, the U.S. Consumer Product Safety Commission, as well as other agencies responsible for the collection of health data, need to establish common definitions and improved data collection strategies to facilitate the regular, ongoing collection of complete, accurate and appropriate data on home injury. Follow-up monitoring should be supported to assess improvements in these systems. Additional Federal funding will be required to make the necessary changes.

4. **Injury researchers and practitioners should work together to develop research priorities to better understand the nature and magnitude of injury in the home environment; Congress should fund initiatives to address these priorities.**

   Research to address home safety represents a critical, unmet need. Current funding for unintentional home safety research at the National Center for Injury Prevention and Control and other partner Federal agencies should be at least doubled. In addition, private agencies and organizations must devote more funding to support well-designed studies of sound approaches to injury prevention.

5. **Designers, architects and engineers as well as policy-makers need to be supported in applying existing knowledge to the development of new interventions, with particular attention to:**

   ■ Improvements in the design, manufacture, and marketing of safe consumer products;

   ■ Development and enforcement of improved regulatory standards for home safety design, construction and maintenance, including monitoring of adherence to standards at the time homes are sold or rented;

- Universally applied safety standards, as well as allowance for enhanced measures appropriate to address specific geographic and population needs;

- Laws and social norms that relate to intervention acceptance and success; and,

- Strategies to modify human behaviors conducive to home safety.

Efforts should be funded to address important sources of injury morbidity and mortality. Such topics include: improved design of stairways; utility of other fall prevention strategies in the home; safety measures to address poisoning associated with over-the-counter and prescription medication, as well as illicit drug use; enhanced strategies for safe firearm storage practices and how to improve them; developing improved environmental and behavioral means to control and facilitate egress from fires and the increased installation and proper maintenance of smoke alarms and automatic fire sprinkler systems; utility of promoting carbon monoxide detectors; and, home safety needs of persons with various types of physical or mental disabilities.

6. **Funding agencies and organizations should require well-designed evaluations as an essential component of funding intervention efforts.**

   Future studies should attempt to examine trends in the use of safety measures to help understand which preventive strategies work and which do not so that resources can be vigorously directed to the most promising prevention efforts. This will help direct resources to those areas most in need of attention, and it will help ensure the use of approaches most likely to be successful. Those approaches that are supported by evidence should replace approaches for which success cannot be demonstrated.

7. **Funding agencies and organizations should support development of improved ways of disseminating information about home safety to the general population as well as decision makers.**

   Federal agencies, research institutions and private organizations responsible for collecting, analyzing and interpreting data must examine and improve means of organizing and releasing information about home safety in scientific journals. Working in close partnership with consumer media outlets could help to increase public awareness of the issue and to facilitate priority-setting within businesses and government that adequately reflects the scope and nature of the problem.

Introduction

Unintentional injury is a major public health problem in the United States. It is the leading cause of death for individuals between the ages of 1 and 34, and is the fifth leading cause of death in the United States **(Table 5, page 20)**. An average of more than 91,000 individuals die each year from an unintentional injury, and approximately 20 percent of these deaths occur in the home. This yields an average of more than 18,000 deaths that occur from a home injury each year. An even larger percentage of nonfatal unintentional injuries occur in the home. Of all nonfatal unintentional injury events, 42 percent occur in the home, translating to nearly 12 million nonfatal home injuries each year. In addition, emergency departments treat more than 10 million home injuries annually, and an average of 11 million home injuries are seen by a private physician. In total, unintentional home injuries account for nearly 21 million medical visits on average each year. Individuals spend more than $222 billion annually in medical costs to care for home injuries.

The Home Safety Council commissioned a second edition of *The State of Home Safety in America* to update the statistics presented in the first edition and to examine trends in the incidence of home injury over time. This report presents the incidence of fatal and nonfatal unintentional home injury, the trends in the incidence of fatal and nonfatal home injury, the individual and employer costs associated with unintentional home injury, and the prevalence of hazards and protective practices associated with unintentional injury at home.

Methods

Definitions

For purposes of this report, a ***home*** was conceptualized as a place in which people live independently. It includes houses, farmhouses, houses on military bases, manufactured homes, apartments, condominiums and townhouses, and excludes dormitories, prisons, nursing homes, long-term care facilities, mental health institutions, halfway houses, shelters, and barracks. Due to the variation in how "home" was defined across the data sources used to compile this report, strict adherence to the definition could not be accomplished.

Injury is defined as a condition resulting from contact with an external force, such as mechanical injury, chemicals and poisons, temperature extremes, electricity or radiation, or the absence of necessities like air. ***Unintentional injury*** is an injury that occurs without the intent for harm and typically involves a single instantaneous event such as a fall or contact with a hot surface. By definition of unintentional, all homicide, suicide and forms of assault were excluded.

Home injury was defined as an injury that occurs within or around (e.g., yard, garage, or driveway) an individual's home. Streets and sidewalks were excluded.

Data Sources

The data sources used to generate the prevalence and trends of fatal and nonfatal home injury include the National Vital Statistics System, National Health Interview Survey, and National Hospital Ambulatory Medical Care Survey- Emergency Department. These data are compiled by the National Center for Health Statistics of the Centers for Disease Control and Prevention (CDC).

- The *National Vital Statistics System (NVSS)* is a collection of data from all death certificates filed in vital statistics offices in the United States. NVSS data used for this report include the time period 1992 through 1999.

- The *National Health Interview Survey (NHIS)* is an annual survey that collects demographic and health data on a nationally representative sample of the civilian, non-institutionalized population residing in the United States. The survey solicits information about the number of injuries that occurred in the three months prior to survey administration and which required the advice or therapy from any health care professional and/or resulted in lost days of work and/or school. NHIS data have been collected annually since 1957 from approximately 43,000 households each year. NHIS data used in this report are from 1997 through 2001.

  ➤ In this report, results from NHIS are referred to as "nonfatal injuries." All NHIS cases are nonfatal.

- The *National Hospital Ambulatory Medical Care Survey- Emergency Department (NHAMCS-ED)* is a national probability sample survey of emergency department utilization in non-federal, short-stay hospitals. Visits are classified as injury-related based on responses to the survey instrument in which injury was noted as a reason for the visit, a presenting complaint, or a diagnosis. NHAMCS-ED data have been collected annually since 1992, and the time period used for this report includes 1993 through 2000, with the exception of 1995. In 1995, the national dataset included data processing errors, and the location of the injury could not be delineated.

  ➤ In this report, results from NHAMCS-ED are referred to as "emergency department visits." NHAMCS-ED cases can be either fatal or nonfatal.

The data sources used to generate the cost of unintentional home injury include the National Vital Statistics System, National Hospital Discharge Survey, National Health Interview Survey, and National Electronic Injury Surveillance System - All Injury Program.

- The *National Hospital Discharge Survey (NHDS)* is a national probability survey of the characteristics of inpatients discharged from non-federal, short-stay hospitals in the United States. The NHDS has been conducted annually since 1965 by the CDC's National Center for Health Statistics. The NHDS collects data from a sample of approximately 270,000 inpatient records acquired from a national sample of about 500 hospitals. NHDS data used for this report are from 1997 through 2001.

- The *National Electronic Injury Surveillance System - All Injury Program (NEISS-AIP)* is a collaborative data collection effort between the CDC National Center for Injury Prevention and Control and the United States Consumer Product Safety Commission. NEISS-AIP data are collected from the emergency departments of 100 hospitals in the U.S., selected as a probability sample of more than 5,300 hospitals with emergency departments. NEISS-AIP data provide national estimates of all types and external causes of injuries and poisonings treated in U.S.

hospital emergency departments. NEISS-AIP data have been collected since 2001, and the data represented in this report are from January through December of 2001.

The data used to calculate the prevalence of safety issues and protective practices associated with unintentional home injury were obtained from a sample of 1,003 households in 48 states and the District of Columbia. Sampling involved the use of random digit dialing methods, using a sample of telephone numbers from active residential telephone exchanges in the continental United States (i.e., excluding Alaska and Hawaii). The survey was developed by the University of North Carolina (UNC) Injury Prevention Research Center and administered in 2002 by the UNC Survey Research Unit.

Injury and Injury Location Coding

Injuries reported in the national data sources were coded using "external cause of injury codes" (E-codes) in accordance with the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM). The ICD-9-CM was designed by the United States Public Health Service and the World Health Organization (WHO) for the classification of morbidity and mortality information for statistical purposes, the indexing of hospital records by disease and operations, and data storage and retrieval. E-codes specifically permit the classification of environmental events, circumstances, and conditions for causes of injury and poisoning. E-codes selected for inclusion in this report were based on the ICD-9 framework for presenting injury mortality and morbidity data, as recommended by the CDC National Center for Health Statistics. A matrix of the E-codes and corresponding cause of injury descriptions are provided in Technical Appendix I of this report.

The location of the injury was defined and provided by each of the national data sources. Location categories used in this report included home, other than home, and unknown. "Home" was defined as within or around (e.g., yard or garage) an individual's home. "Other than home" was defined as outside of the home environment (e.g., street, sidewalk, school, work, park). "Unknown" was used to designate that the place of the injury was not provided in the national data source. Note that the injury location for 33% of all unintentional injury deaths (from NVSS) and 25% of all unintentional injuries resulting in an emergency department visit (from NHAMCS-ED) were not recorded in the national data sets. Therefore, the numbers presented in this report likely underestimate the actual number of unintentional injuries that occur in the home.

In addition, although a standard definition of "home" has been developed as part of the International Classification of External Causes of Injury (Consumer Safety Institute), it is not widely used. This may also contribute to an underestimate of the number of injuries that occur in the home, as reported in the national data sources.

Statistical Analysis

Estimates of fatal and nonfatal unintentional home injury were calculated as the average annual number of home injuries per year of the national data source and the average annual rate of home injury per average U.S. population per year of the national data source. All population estimates were obtained from the United States Bureau of the Census. Note that some numbers may not add up to the totals presented in the tables due to rounding averages across years to the nearest whole number.

Rates derived from NVSS data were based on the average resident U.S. population between 1992 and 1999. Rates derived from NHIS data were based on the average civilian, non-institutionalized U.S. population between 1997 and 2001. Rates derived from NHAMCS-ED data were based on the average civilian, non-institutionalized U.S. population between 1993 and 2000. Detailed descriptions of the methods used for the home injury cost trends and the 2002 survey of safety issues and protective practices are provided in the Technical Appendices of this report.

Table 5. Leading Causes of Death by Age Group, All Races, Both Sexes, U.S., 2001.

RANK	<1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+	All Ages
1	Congenital Anomalies	Unintentional Injury	Unintentional Injury	Unintentional Injury	Unintentional Injury	Unintentional Injury	Malignant Neoplasms	Malignant Neoplasms	Malignant Neoplasms	Malignant Neoplasms	Heart Disease	Heart Disease	Heart Disease
2	Short Gestation	Congenital Anomalies	Malignant Neoplasms	Malignant Neoplasms	Homicide	Homicide	Unintentional Injury	Heart Disease	Heart Disease	Heart Disease	Malignant Neoplasms	Malignant Neoplasms	Malignant Neoplasms
3	SIDS	Malignant Neoplasms	Congenital Anomalies	Suicide	Suicide	Suicide	Heart Disease	Unintentional Injury	Chronic Low. Respiratory Disease	Chronic Low. Respiratory Disease	Cerebro-vascular	Cerebro-vascular	Cerebro-vascular
4	Maternal Pregnancy Comp.	Homicide	Homicide	Congenital Anomalies	Malignant Neoplasms	Malignant Neoplasms	Suicide	Liver Disease	Cerebro-vascular	Cerebro-vascular	Chronic Low. Respiratory Disease	Alzheimer's Disease	Chronic Low. Respiratory Disease
5	Placenta Cord Membranes	Heart Disease	Heart Disease	Heart Disease	Heart Disease	Heart Disease	HIV	Suicide	Diabetes Mellitus	Diabetes Mellitus	Diabetes Mellitus	Influenza & Pneumonia	Unintentional Injury
6	Respiratory Distress	Influenza & Pneumonia	Benign Neoplasms	Chronic Low. Respiratory Disease	Congenital Anomalies	HIV	Homicide	Cerebro-vascular	Unintentional Injury	Unintentional Injury	Influenza & Pneumonia	Chronic Low. Respiratory Disease	Diabetes Mellitus
7	Unintentional Injury	Septicemia	Influenza & Pneumonia	Benign Neoplasms	HIV	Cerebro-vascular	Liver Disease	Diabetes Mellitus	Liver Disease	Nephritis	Alzheimer's Disease	Diabetes Mellitus	Influenza & Pneumonia
8	Bacterial Sepsis	Perinatal Period	Chronic Low. Respiratory Disease	Influenza & Pneumonia	Cerebro-vascular	Diabetes Mellitus	Cerebro-vascular	HIV	Suicide	Influenza & Pneumonia	Nephritis	Nephritis	Alzheimer's Disease
9	Circulatory System Disease	Benign Neoplasms	Cerebro-vascular	Influenza & Pneumonia	Influenza & Pneumonia	Congenital Anomalies	Diabetes Mellitus	Chronic Low. Respiratory Disease	Nephritis	Septicemia	Unintentional Injury	Unintentional Injury	Nephritis
10	Intrauterine Hypoxia	Cerebro-vascular	Septicemia	Cerebro-vascular	Chronic Low. Respiratory Disease	Liver Disease	Influenza & Pneumonia	Homicide	Septicemia	Liver Disease	Septicemia	Septicemia	Septicemia

Data Source: National Center for Health Statistics (NCHS) Vital Statistics System, Web-based Injury Statistics Query and Reporting System (WISQARS™).

Chapter 1 -- Unintentional Home Injury Deaths

The home is the second most common location of unintentional fatal injuries in the United States, motor vehicles traveling on the road being the first. More than 18,000 people in the United States die each year from an unintentional injury that occurs in the home **(Table 1.1)**. This yields an average annual death rate of 6.83 deaths per 100,000 persons. The top five causes of unintentional home injury death are falls, poisoning, fires/burns, choking and suffocation, and drowning/submersion **(Table 1.1, Figure 1.1)**. These events account for nearly 90 percent of all unintentional home injury deaths, with falls alone accounting for one-third of the deaths **(Table 1.1)**.

Table 1.1. Unintentional Home Injury Deaths. Average Annual Number, Percentage and Rate (per 100,000 persons), All Causes, U.S., 1992-1999.

Cause of Death	Number	Percentage	Rate
Fall	**5,961**	**33.0**	**2.25**
Poisoning	**4,833**	**26.8**	**1.83**
Fire/Burn	**3,402**	**18.8**	**1.29**
Choking/Suffocation	**1,092**	**6.1**	**0.41**
Drowning/Submersion	**823**	**4.6**	**0.31**
Firearm	590	3.3	0.22
Natural/Environmental	427	2.4	0.16
Struck By/Against	285	1.6	0.11
Miscellaneous	230	1.3	0.09
Unspecified	215	1.2	0.08
Machinery	127	0.7	0.05
Cut/Pierce	60	0.3	0.02
Overexertion	3	<0.1	<0.01
Motor Vehicle	0	0.0	0.00
Pedal Cyclist, Other	0	0.0	0.00
Pedestrian, Other	0	0.0	0.00
Transport, Other	0	0.0	0.00
TOTAL	**18,048**	**100.0**	**6.83**

Data Source: National Vital Statistics System, 1992-1999.

Note in **Table 1.1** that categories of motor vehicle, pedal cyclist (other), pedestrian (other) and transport (other) pertain only to incidents that occur around the home (e.g., driveways). There were no home injury deaths due to these causes between 1992 and 1999 according to the National Vital Statistics System. This does not suggest that such causes are not important but that the injuries that do occur generally do not result in death (refer to the nonfatal statistics in Chapter 2). In addition, the only firearm injuries included in this report are those that are unintentionally inflicted, not those associated with interpersonal violence or suicide.

It should also be noted that the place of injury occurrence is missing for a significant percentage of injury deaths in the National Vital Statistics System. Specifically, 33 percent of all unintentional injury deaths do not have a location recorded. Therefore, the figures presented in this report underestimate the actual incidence of home injury death in the United States.

Figure 1.1. Unintentional Home Injury Deaths. Average Annual Rate (per 100,000 persons), All Causes[1], U.S., 1992-1999.

Rate (per 100,000 persons)

[1] Figure does not include causes where average number of deaths is less than 5.

Cause of Death

Data Source: National Vital Statistics System, 1992-1999.
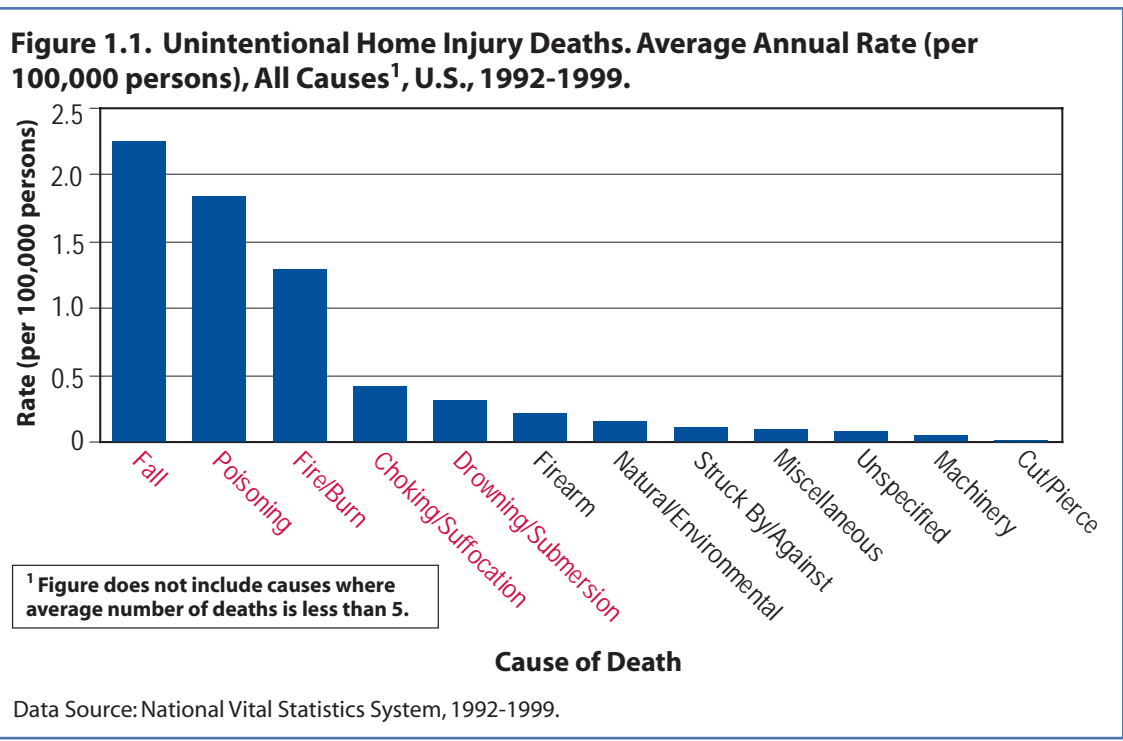
The calculation of rates allows comparison of a problem across populations of different sizes. For example, using rates per 100,000 persons younger than age 5 allows a fair comparison to rates per 100,000 of people in other age groups, even if the numbers of people in the different age groups differ.

Rates of unintentional home injury death are highest among adults 80 and older, followed by those between 70 and 79, and children less than 1 **(Table 1.2)**. Across all age groups, males have higher rates of unintentional home injury death **(Table 1.2, Figure 1.2)**. Overall, males account for 63 percent of all deaths, while females account for the remaining 37 percent **(Table 1.2, Figure 1.3)**.

Table 1.2. Unintentional Home Injury Deaths. Average Annual Number and Rate (per 100,000 persons), by Age Group and Sex, U.S., 1992-1999.

TOTAL			MALE			FEMALE		
Age Group	Number	Rate	Age Group	Number	Rate	Age Group	Number	Rate
<1	469	12.19	<1	268	12.34	<1	201	9.81
1-4	998	6.42	1-4	616	7.48	1-4	382	5.23
5-9	354	1.85	5-9	215	2.17	5-9	139	1.58
10-14	275	1.47	10-14	194	1.99	10-14	81	0.95
15-19	408	2.22	15-19	327	3.40	15-19	81	0.96
20-29	1,312	3.53	20-29	1,010	6.00	20-29	302	2.08
30-39	2,553	5.88	30-39	1,896	9.93	30-39	657	3.88
40-49	2,637	6.85	40-49	1,965	10.98	40-49	672	3.98
50-59	1,369	5.32	50-59	941	7.63	50-59	428	3.55
60-69	1,444	7.21	60-69	931	9.94	60-69	513	5.25
70-79	2,270	14.57	70-79	1,253	18.07	70-79	1,017	11.94
80+	3,960	47.91	80+	1,715	57.37	80+	2,245	39.80
TOTAL	18,048	6.83	TOTAL	11,331	8.78	TOTAL	6,718	4.97

Data Source: National Vital Statistics System, 1992-1999.

Figure 1.2. Unintentional Home Injury Deaths. Average Annual Rate (per 100,000 persons), by Age Group and Sex, U.S., 1992-1999.
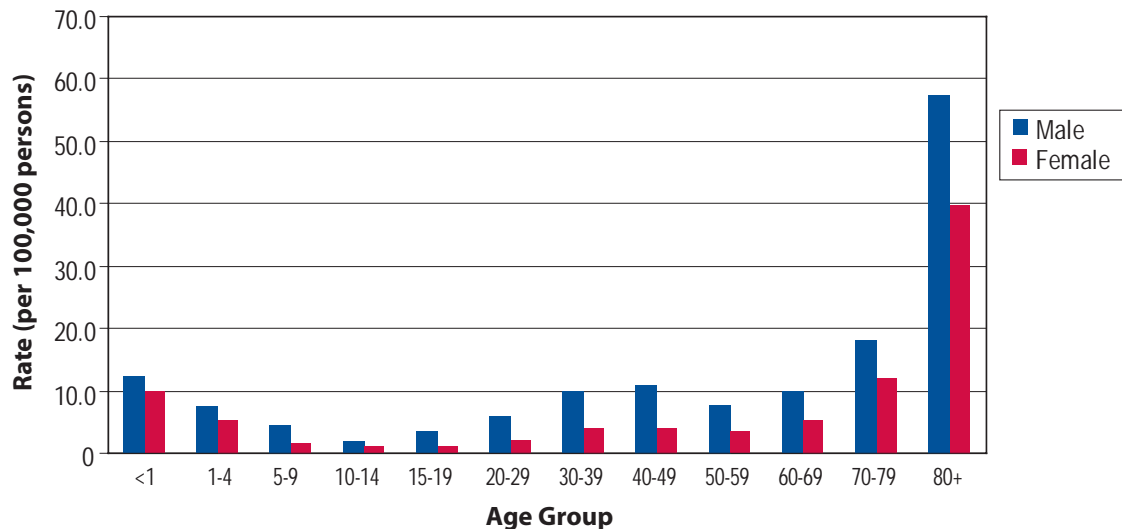
Data Source: National Vital Statistics System, 1992-1999.

Figure 1.3. Unintentional Home Injury Deaths. Average Annual Number, Percentage and Rate (per 100,000 persons), by Sex, U.S., 1992-1999.

Female (6,718)
37.2%
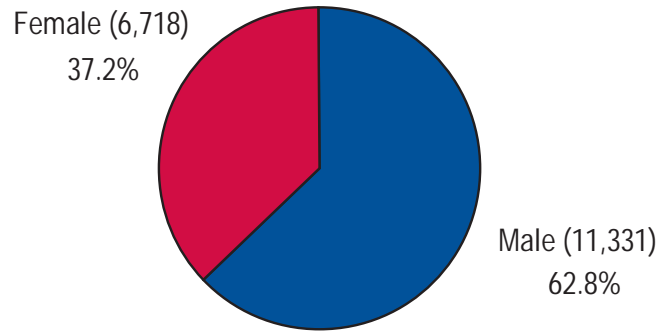
Male (11,331)
62.8%

Sex	Number of Deaths	Rate
Male	11,331	8.78
Female	6,718	4.97

Data Source: National Vital Statistics System, 1992-1999.

Rates of fatal unintentional home injury are highest among older adults and young children. Their stages of physical development make them vulnerable population groups for fatal injury. Children may become injured while engaging in normal exploratory behaviors, lacking the judgment to avoid dangers. Older adults may experience more injuries as a result of balance or limited mobility (e.g., escaping a fire). When injured, older adults are often unable to rehabilitate in the same way fully developed and stronger younger persons can. In addition, these age groups often experience more home injuries, in part because they spend more time in the home environment, compared with other age groups who spend large amounts of time at school and/or work.

The scientific literature does not provide a clear rationale for why males have higher rates of home injury death than females, although hypotheses for the relationship can be made. For example, males may engage in riskier behaviors than females, which may expose them to activities that lead to increased injury severity with a greater probability of resulting in death. For instance, males may be more likely to climb a ladder and fall from greater heights, fight a fire with a fire extinguisher rather than flee, or use saws for home improvement, compared with females. More research to identify why home injury death rates differ by sex could help in the development of behavioral and environmental intervention strategies.

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Chapter 2 -- Nonfatal Unintentional Home Injury

The majority of unintentional home injuries do not result in death. In fact, for every one home injury death, there are more than 650 nonfatal home injuries. Estimating the actual incidence of nonfatal injuries that occur in the home is difficult because no single source of information exists for documenting such events. Estimates for this chapter were derived from two data sources: (1) the National Health Interview Survey (NHIS), and (2) the National Hospital Ambulatory Medical Care Survey- Emergency Department (NHAMCS-ED). The NHIS captures home injuries where advice or therapy from a health care professional was solicited and/or which resulted in lost days of school and/or work, and the NHAMCS-ED captures home injuries resulting in an emergency department visit.

National Health Interview Survey

The National Health Interview Survey (NHIS) collects information on a nationally representative sample of the civilian, non-institutionalized population residing in the United States. As a result, the NHIS provides the most comprehensive means of estimating the number of nonfatal injuries occurring in the home. According to the NHIS, there are more than 12 million nonfatal, unintentional home injuries requiring medical attention and/or which resulted in lost work/school days every year in the United States **(Table 2.1)**.

Table 2.1. Nonfatal Unintentional Home Injuries. Average Annual Number, Percentage and Rate (per 100,000 persons), All Causes, U.S., 1997-2001.

Cause of Injury	Number	Percentage	Rate
Fall	5,105,558	41.2	1,884.0
Struck By/Against	1,467,203	11.8	541.4
Cut/Pierce	1,398,434	11.3	515.7
Overexertion	1,262,619	10.2	466.2
Poisoning	726,296	5.9	263.9
Natural/Environmental	580,343	4.7	213.4
Miscellaneous	560,903	4.5	206.0
Unspecified	464,922	3.8	171.9
Fire/Burn	261,326	2.1	96.4
Pedal Cyclist, Other	169,530	1.4	62.5
Transport, Other	139,856	1.1	51.4
Machinery	122,373	1.0	45.2
Motor Vehicle	81,902	0.7	30.3
Pedestrian, Other	21,974	0.2	8.2
Choking/Suffocation	18,101	0.1	6.7
Firearm	12,144	0.1	4.5
Near-Drowning/Submersion	2,380	<0.1	0.9
TOTAL	12,395,864	100.0	4,410.0

Data Source: National Health Interview Survey, 1997-2001.

The top five causes of nonfatal, unintentional home injuries are (1) falls, (2) injuries in which a person was struck by or against an object or person (denoted "struck by/against"), (3) injuries caused by sharp objects, such as knives or broken glass (denoted "cut/pierce"), (4) injuries associated with performing movements too strenuous for the body, such as excessive physical exercise or using too much energy in pushing, lifting or pulling (e.g., a back injury from lifting furniture) (denoted "overexertion") and (5) poisonings **(Figure 2.1)**.

An example of a "struck by/against" home injury may include an incident where a child is unintentionally hit by a soccer ball during play or when an older adult bumps into a door or table. An example of a "cut/ pierce" home injury can include being cut by a powered lawn mower or powered hand tool, such as a saw, hedge clipper or drill. "Cut/pierce" home injuries may also include injuries due to such household appliances as electric can openers or mixers.

Falls account for 41.2 percent of all nonfatal, unintentional home injuries, and the top five causes combined account for more than 80 percent of all events. Note that categories of motor vehicle, pedal cyclist (other), pedestrian (other) and transport (other) pertain only to incidents that occur around the home (e.g., driveways) **(Table 2.1)**.

Figure 2.1. Nonfatal Unintentional Home Injuries. Average Annual Rate (per 100,000 persons), All Causes, U.S., 1997-2001.
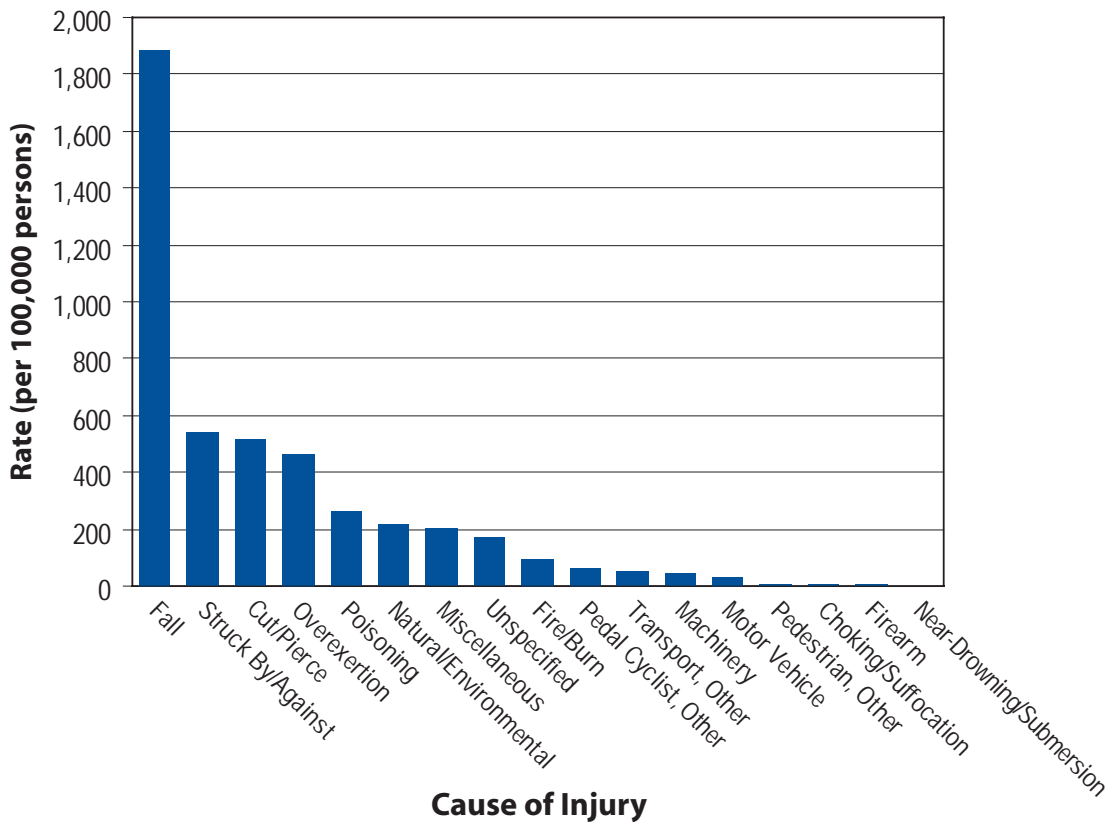
Data Source: National Health Interview Survey, 1997-2001.

Adults 70 and older and children between 1 and 4 have the highest rates of nonfatal, unintentional home injury **(Table 2.2, Figure 2.2)**. Unlike home injury death where males have the highest rates across all age groups, females 40 and older have higher rates of nonfatal, unintentional home injury, compared with males in the same age groups. Across all age groups, females experienced more than half (53.1%) of all nonfatal home injuries, while males experienced 46.9 percent of the injuries **(Figure 2.3)**.

As females age, they experience higher rates of nonfatal unintentional home injury than males. The reasons for this are not clearly understood. Females may spend more time in the home, compared with males, thereby increasing their opportunity for injury. The higher rates among adult females may be a reflection of how data from the National Health Interview Survey are collected; that is, by self-report, and females may simply report more injuries than males. However, given that 41.2 percent of nonfatal home injuries are due to falls, it may be that older adult females experience higher rates than older adult males because as females age, they may be more prone to falls and fall-related fractures due to reduced bone density, compared with aging males.

Young males may have higher rates of nonfatal home injury than young females because of behavioral factors that place them in riskier situations with increased exposure to injury. Unlike adult males where the same injuries may result in higher rates of death, younger males may be better able to recover from their injuries, even those that may be more severe in nature. Research that addresses the behavioral and environmental factors associated with home injury is needed to understand the differences observed, testing the kinds of hypotheses noted here.

Table 2.2. Nonfatal Unintentional Home Injuries. Average Annual Number and Rate (per 100,000 persons), by Age Group and Sex, U.S., 1997-2001.

TOTAL			MALE			FEMALE		
Age Group	Number	Rate	Age Group	Number	Rate	Age Group	Number	Rate
<1	116,531	3,459	<1	71,412	3,451	<1	45,120	2,343
1-4	1,260,914	9,995	1-4	715,857	8,957	1-4	545,057	7,042
5-9	1,043,018	5,933	5-9	619,030	5,905	5-9	423,988	4,259
10-14	895,822	5,119	10-14	539,266	5,272	10-14	356,557	3,640
15-19	658,452	4,065	15-19	387,178	3,851	15-19	271,274	2,763
20-29	1,210,740	3,921	20-29	539,034	2,999	20-29	671,706	3,649
30-39	1,620,732	4,460	30-39	858,876	4,162	30-39	761,856	3,553
40-49	1,592,364	4,516	40-49	718,661	3,518	40-49	873,703	4,139
50-59	1,230,469	5,085	50-59	510,166	3,651	50-59	720,303	4,817
60-69	953,066	5,568	60-69	371,171	4,022	60-69	581,896	5,545
70-79	1,021,152	7,641	70-79	304,308	4,522	70-79	716,844	8,183
80+	792,604	11,547	80+	176,440	6,503	80+	616,164	12,787
TOTAL	12,395,864	4,410	TOTAL	5,811,398	4,389	TOTAL	6,584,466	4,733

Data Source: National Health Interview Survey, 1997-2001.

2

Figure 2.2. Nonfatal Unintentional Home Injuries. Average Annual Rate (per 100,000 persons), by Age Group and Sex, U.S., 1997-2001.
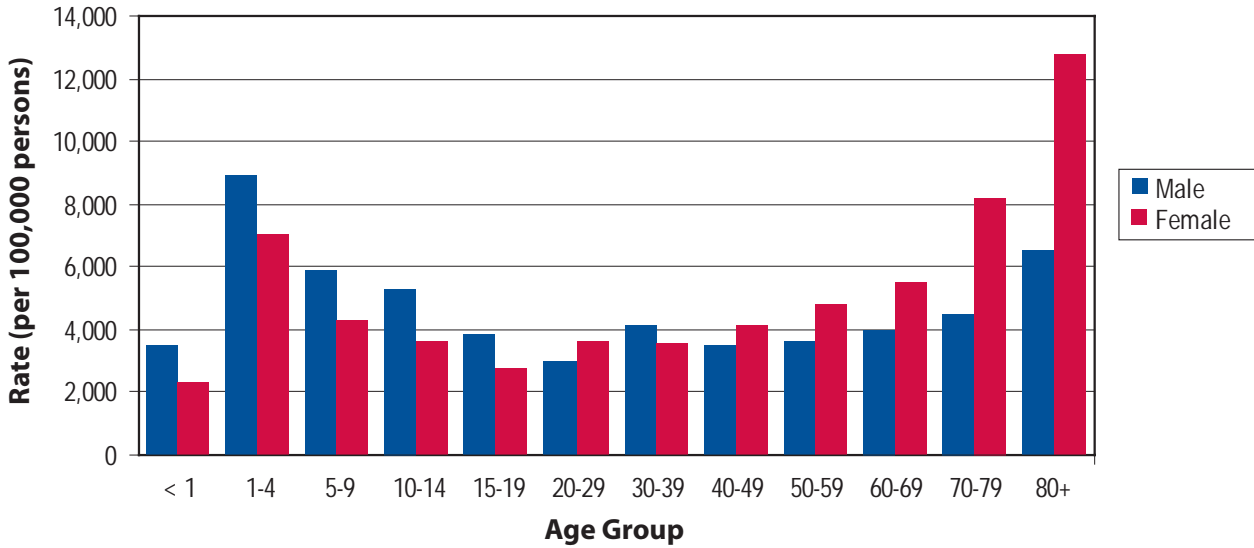
Data Source: National Health Interview Survey, 1997-2001.

Figure 2.3. Nonfatal Unintentional Home Injuries. Average Annual Number, Percentage and Rate (per 100,000 persons), by Sex, U.S., 1997-2001.

Female (6,584,466)
53.1%
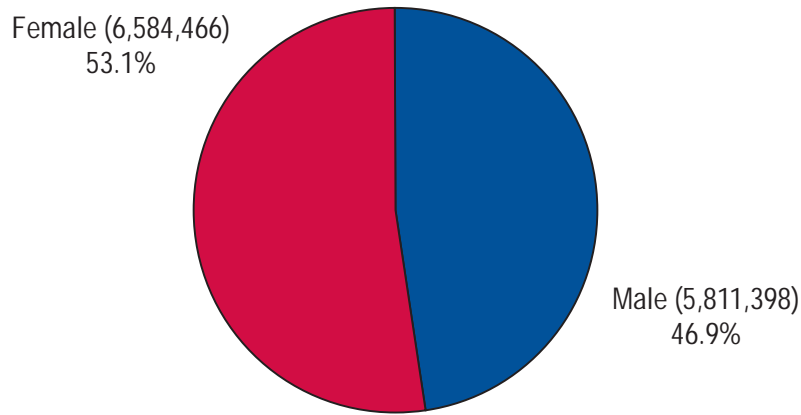
Male (5,811,398)
46.9%

Sex	Number of Injuries	Rate
Male	5,811,398	4,389
Female	6,584,466	4,733

Data Source: National Health Interview Survey, 1997-2001.

National Hospital Ambulatory Medical Care Survey -- Emergency Department

According to data collected as part of the National Hospital Ambulatory Medical Care Survey - Emergency Department (NHAMCS-ED), people in the United States experience more than 10 million unintentional home injuries that result in a visit to an emergency department every year **(Table 2.3)**. The national annual rate of emergency department visits for unintentional home injury is estimated at 3,785.3 injuries per 100,000 persons. The top five reasons people seek emergency department care for an unintentional home injury include falls, being struck by or against an object, being cut or pierced by a sharp object, miscellaneous other events, and exposure to natural/environmental factors **(Figure 2.4)**. These injuries account for more than 80 percent of all emergency department visits for unintentional injuries that occur in the home.

The "Miscellaneous" category represents a combination of multiple causes of injury, where individual counts of the causes were too small to code in separate categories. Injuries in this category can be due to such mechanisms as foreign bodies unintentionally entering the eye, being caught between a sliding door and door frame, being shocked by an electrical current from an exposed wire, or being pinched by a folding object like a chair. Recall that categories of motor vehicle, pedal cyclist (other), pedestrian (other) and transport (other) pertain only to incidents that occur around the home (e.g., driveways).

The place of occurrence for injuries resulting in emergency department care is missing in 25 percent of the cases recorded in the National Hospital Ambulatory Medical Care Survey - Emergency Department. Therefore, the figures presented in this report likely underestimate the actual number of home injuries that result in hospital emergency department visits in the United States.

Table 2.3. Nonfatal Unintentional Home Injuries Resulting in Emergency Department Visits. Average Annual Number, Percentage and Rate (per 100,000 persons), All Causes, U.S., 1993-2000.

Cause of Injury	Number	Percentage	Rate
Fall	3,838,230	38.2	1,444.3
Struck By/Against	1,655,812	16.5	622.4
Cut/Pierce	1,418,671	14.1	534.0
Miscellaneous	716,061	7.1	269.7
Natural/Environmental	533,731	5.3	201.0
Overexertion	484,634	4.8	182.3
Unspecified	422,508	4.2	159.2
Fire/Burn	304,434	3.0	114.8
Poisoning	236,244	2.3	88.5
Pedal Cyclist, Other	112,709	1.1	42.6
Transport, Other	109,701	1.1	41.1
Machinery	90,341	0.9	33.9
Motor Vehicle	67,694	0.7	25.4
Choking/Suffocation	36,806	0.4	13.9
Firearm	18,375	0.2	7.0
Near-Drowning/Submersion	7,171	0.1	2.7
Pedestrian, Other	7,043	0.1	2.6
TOTAL	10,060,165	100.0	3,785.3

Data Source: National Hospital Ambulatory Medical Care Survey -- Emergency Department, 1993-2000.

Figure 2.4. Nonfatal Unintentional Home Injuries Resulting in Emergency Department Visits. Average Annual Rate (per 100,000 persons), All Causes, U.S., 1993-2000.
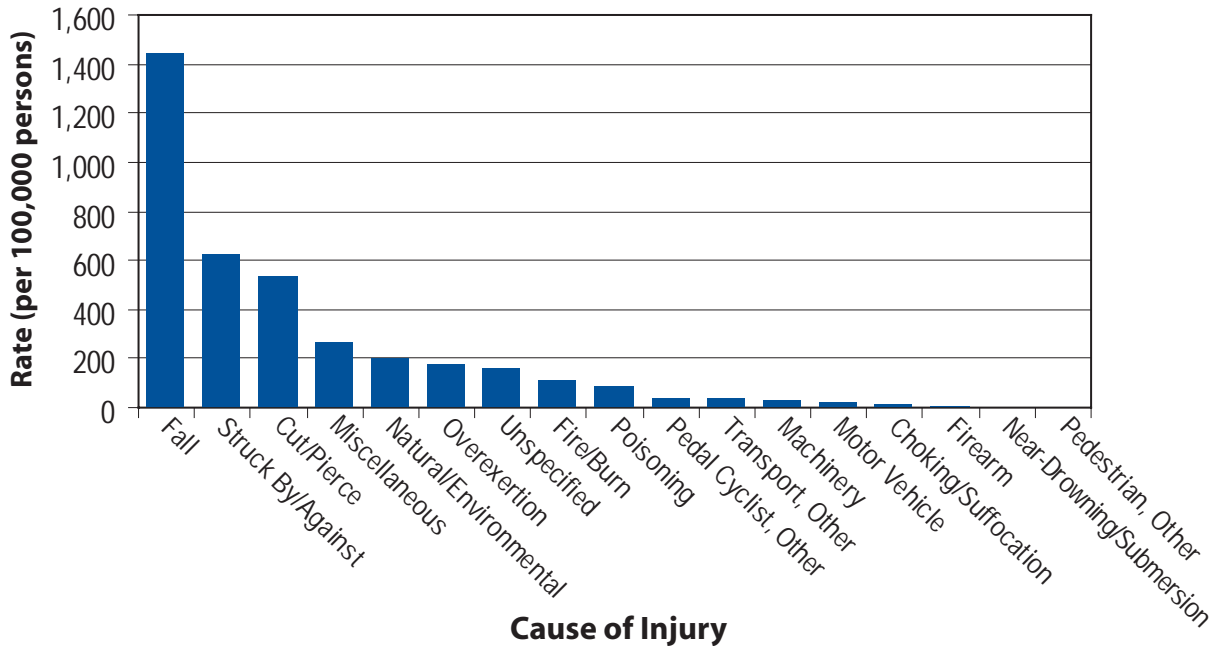
Data Source: National Hospital Ambulatory Medical Care Survey -- Emergency Department, 1993-2000.

Rates of unintentional home injury resulting in emergency department visits are greatest for older adults, specifically those 80 and older, and for young children less than 5 **(Table 2.4)**. Rates of emergency department visits for unintentional home injuries are similar for males and females **(Figure 2.5, Figure 2.6)**. However, as people age, females sustain higher rates of unintentional home injury resulting in emergency department care than males. In particular, females 50 years of age and older experience higher rates than males in the same age groups **(Figure 2.5)**. Similar to findings and interpretations from the NHIS, these results may be due to females being at increased risk of injury associated with problems less common among males, such as osteoporosis. It may also be that females seek medical care more than males, even for the same injuries.

Table 2.4. Nonfatal Unintentional Home Injuries Resulting in Emergency Department Visits. Average Annual Number and Rate (per 100,000 persons), by Age Group and Sex, U.S., 1993-2000.

TOTAL			MALE			FEMALE		
Age Group	Number	Rate	Age Group	Number	Rate	Age Group	Number	Rate
<1	226,977	5,723.7	<1	127,147	5,865.4	<1	99,830	5,150.1
1-4	1,513,784	9,490.5	1-4	871,293	9,943.1	1-4	642,491	8,243.6
5-9	952,549	4,778.9	5-9	568,884	5,100.7	5-9	383,665	3,939.8
10-14	716,643	3,665.5	10-14	423,297	3,826.9	10-14	293,346	3,074.9
15-19	652,292	3,448.5	15-19	370,516	3,465.8	15-19	281,776	3,024.5
20-29	1,196,538	3,242.7	20-29	621,122	3,099.6	20-29	575,416	3,070.3
30-39	1,301,376	3,035.8	30-39	642,570	2,829.2	30-39	658,806	3,022.7
40-49	982,769	2,507.0	40-49	503,245	2,428.6	40-49	479,524	2,399.1
50-59	611,759	2,305.9	50-59	266,699	1,925.6	50-59	345,060	2,520.4
60-69	555,162	2,829.2	60-69	237,562	2,416.2	60-69	317,600	3,023.2
70-79	598,894	3,937.4	70-79	220,233	3,107.6	70-79	378,661	4,364.2
80+	751,422	10,311.1	80+	189,316	6,691.8	80+	562,106	11,981.2
TOTAL	10,060,165	3,785.3	TOTAL	5,041,884	3,897.2	TOTAL	5,018,281	3,679.3

Data Source: National Hospital Ambulatory Medical Care Survey -- Emergency Department, 1993-2000.

Figure 2.5. Nonfatal Unintentional Home Injuries Resulting in Emergency Department Visits. Average Annual Rate (per 100,000 persons), by Age Group and Sex, U.S., 1993-2000.

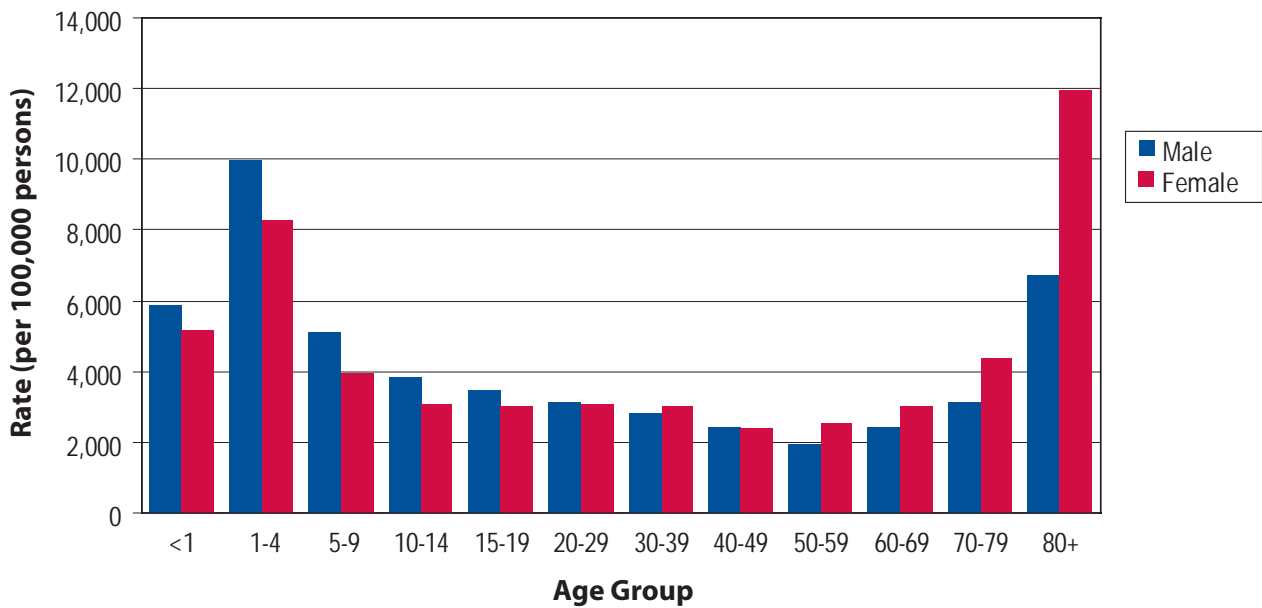Data Source: National Hospital Ambulatory Medical Care Survey -- Emergency Department, 1993-2000.

Figure 2.6. Nonfatal Unintentional Home Injuries Resulting in Emergency Department Visits. Average Annual Number, Percentage and Rate (per 100,000 persons), by Sex, U.S., 1993-2000.

Female (5,018,281)
49.9%
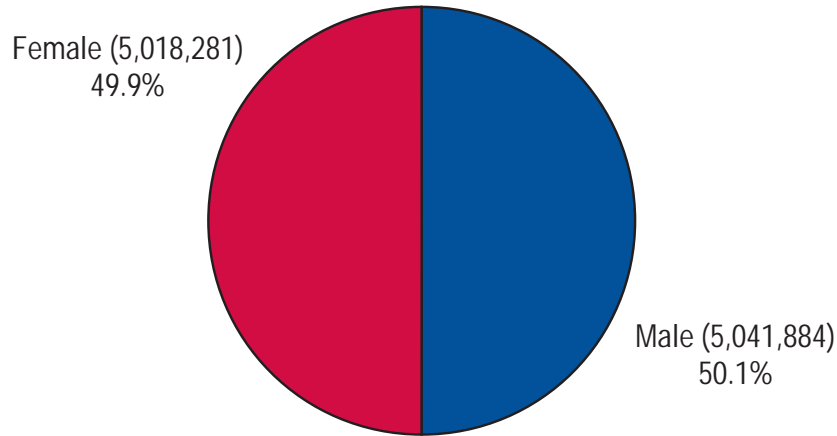
Male (5,041,884)
50.1%

Sex	Number of Injuries	Rate
Male	5,041,884	3,897.2
Female	5,018,281	3,679.3

Data Source: National Hospital Ambulatory Medical Care Survey -- Emergency Department, 1993-2000.

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Chapter 3 -- Leading Causes of Unintentional Home Injury Death

Falls, poisonings, fires and burns, choking and suffocation injury, and drowning and submersions are the leading causes of unintentional home injury death in the United States. These causes account for nearly 90 percent of all unintentional home injury deaths. This chapter describes the demographics of those affected by these types of injuries.

Falls

Deaths — More than half (53.7%) of all unintentional falls resulting in death occur in the home **(Table 3.1)**. Another 35.4 percent of all fall deaths occur in a location other than the home, and the remaining (10.9%) occur in an unknown location. The annual average rate of residential fall deaths is 2.25 per 100,000 persons **(Figure 3.1)**.

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Table 3.1. Location of Fatal Falls. Average Annual Number, Percentage and Rate (per 100,000 persons), U.S., 1992-1999.

Location	Number	Percentage	Rate
Home	5,961	53.7	2.25
Location other than home	3,928	35.4	1.48
Unknown	1,211	10.9	0.46

Data Source: National Vital Statistics System, 1992-1999.

Figure 3.1. Location of Fatal Falls. Average Annual Rate (per 100,000 persons), U.S., 1992-1999.
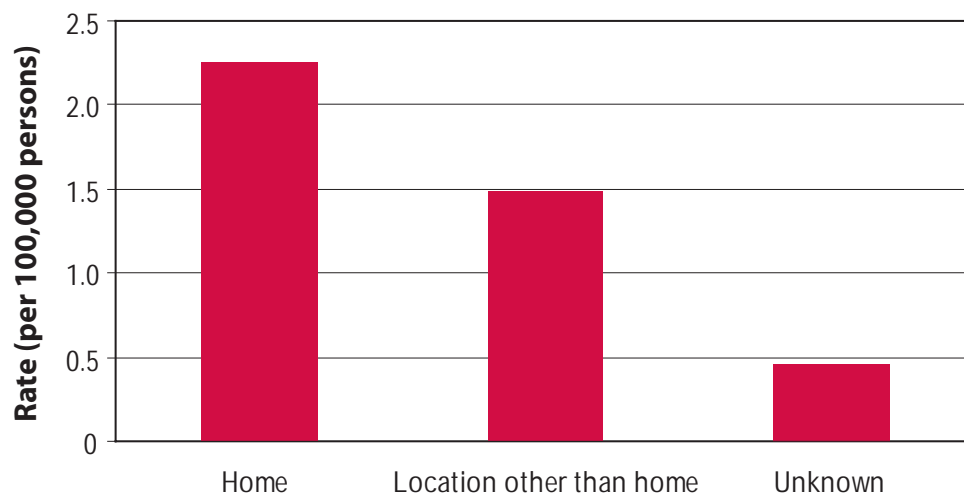
Data Source: National Vital Statistics System, 1992-1999.

The circumstances surrounding the majority (63.0%) of fall deaths occurring in the home defy classification or are not recorded, and are therefore denoted as "other and unspecified falls" **(Table 3.2)**. Because the specific mechanism leading to the injury death cannot be identified in 63 percent of all residential fall deaths, primary measures to reduce the incidence of home falls cannot be identified using the National Vital Statistics System. This is an area where the limitations in how data are collected can have a large impact on injury prevention efforts. Falls on or from stairs or steps are the second leading cause of death due to residential falls (17.4%), followed by falls from slipping, tripping or stumbling (5.8%).

Table 3.2. Unintentional Home Injury Deaths Due to Falls, by External Cause. Average Annual Number and Percentage, U.S., 1992-1998[1].

Description of Fall (External Cause of Injury Code)	Number of Deaths	Percentage of Total
Other and unspecified fall (E888.0)	**3,662**	**63.0**
Fall on or from stairs or steps (E880.9)	**1,010**	**17.4**
Fall on same level from slipping, tripping or stumbling (E885.0)	**340**	**5.8**
Fall from or out of building or other structure (E882.0)	**215**	**3.7**
Fall from ladder (E881.0)	**188**	**3.2**
Fall from chair or bed (E884.2)	**184**	**3.2**
Miscellaneous[2]	**216**	**3.7**

[1]Note that the values in the table exclude deaths from 1999 due to coding changes; therefore, totals may not add up to totals in other tables.
[2]Category includes descriptions such as fall into a hole or other opening in surface and fall from scaffolding.
Data Source: National Vital Statistics System, 1992-1998.

The rate of deaths associated with falls increases substantially with age **(Figure 3.2)**. Very few deaths occur among those younger than 60 years of age. Above the age of 60, rates of fall death rise rapidly with increasing age. Home fall death rates are higher for males than females across all age groups.

Figure 3.2. Fatal Falls in the Home. Average Annual Rate (per 100,000 persons), by Age Group and Sex, U.S., 1992-1999.
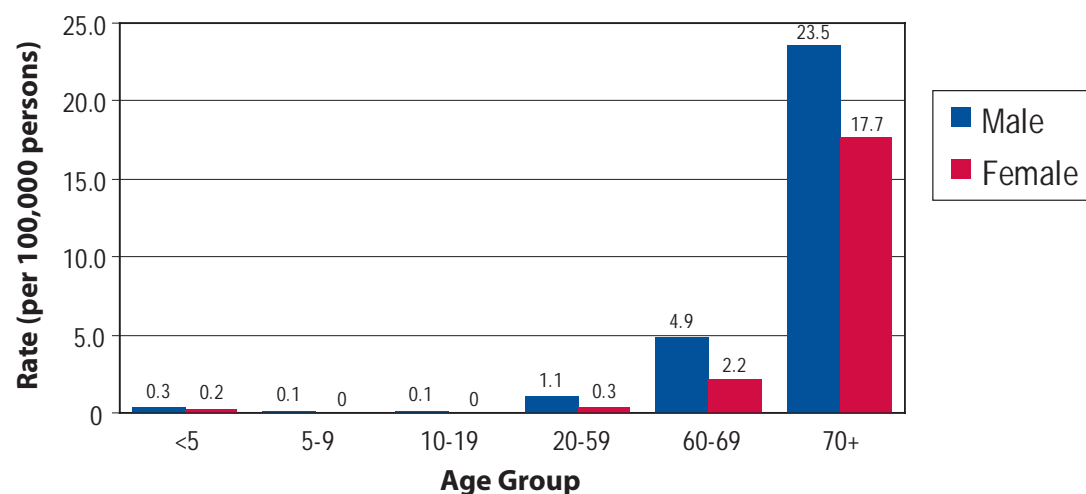
Data Source: National Vital Statistics System, 1992-1999.

Nonfatal Injuries — The majority of nonfatal unintentional falls occur in the home (55.6%), while 43.5 percent occur in a location other than the home and less than 1 percent occur in an unknown location **(Table 3.3)**. An average of 5.1 million nonfatal falls that result in a medical visit and/or lost work/school time occur in the home every year, for an annual rate of 1,884 falls per 100,000 persons **(Figure 3.3)**. Children and older adults have the highest rates of nonfatal residential fall injuries **(Figure 3.4)**. Males experience higher rates of nonfatal fall injuries occurring in the home among persons younger than 20. After age 20, women have the higher rates, and women 70 and older have a rate that is more than two times greater than the rate for males in the same age group.

The reasons for the differences in the rates of fatal and nonfatal falls between males and females are not clear. Differences may be due to the kinds of falls, severity of falls, injuries as a result of the fall, use of medical services, or patterns of recovery from the injury. The specific reasons, however, are not currently known.

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Table 3.3. Location of Nonfatal Falls. Average Annual Number, Percentage and Rate (per 100,000 persons), U.S., 1997-2001.

Location	Number	Percentage	Rate
Home	5,105,558	55.6	1,884.0
Location other than home	3,997,665	43.5	1,475.6
Unknown	76,824	0.8	28.4

Data Source: National Health Interview Survey, 1997-2001.

Figure 3.3. Location of Nonfatal Falls. Average Annual Rate (per 100,000 persons), U.S., 1997-2001.
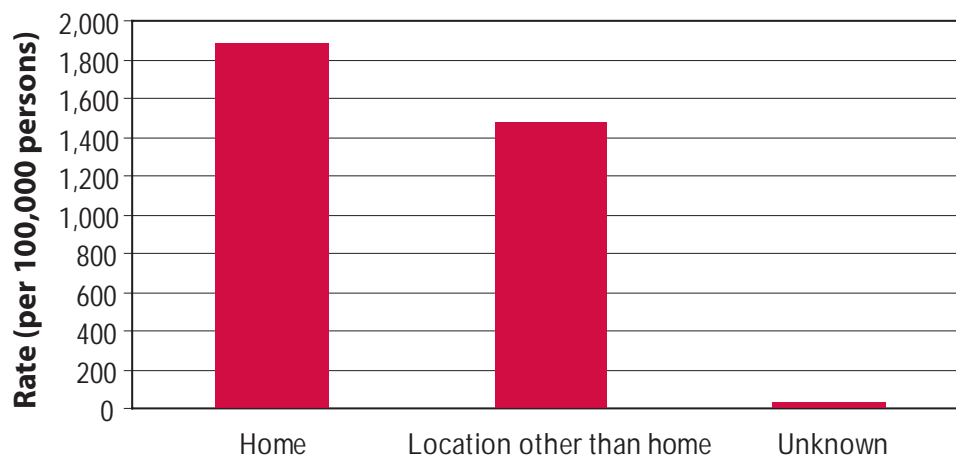
Data Source: National Health Interview Survey, 1997-2001.

Figure 3.4. Nonfatal Falls in the Home. Average Annual Rate (per 100,000 persons), by Age Group and Sex, U.S., 1997-2001.
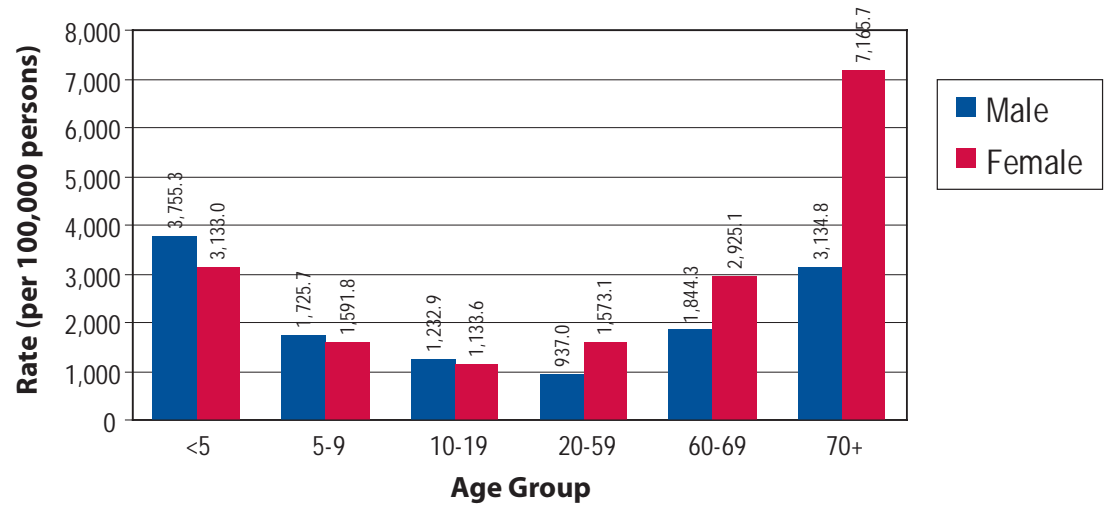
Data Source: National Health Interview Survey, 1997-2001.

Emergency Department Visits — An average of 3.8 million residential fall injuries resulting in an emergency department visit occur every year **(Table 3.4)**, for an annual rate of 1,444.3 falls per 100,000 persons **(Figure 3.5)**. In nearly 20 percent of all nonfatal fall injuries resulting in an emergency department visit, the location of the fall could not be identified **(Table 3.4)**. Therefore, the actual number of home-based falls resulting in an emergency department visit could be larger than the nearly 4 million presented in this report. Emergency department visit rates for falls at home were significantly higher for females 70 and older, compared to males in the same age group **(Figure 3.6)**. Children younger than 5 also had high rates of fall injuries requiring emergency department care.

Table 3.4. Location of Nonfatal Falls Resulting in Emergency Department Visits. Average Annual Number, Percentage and Rate (per 100,000 persons) , U.S., 1993-2000.

Location	Number	Percentage	Rate
Home	3,838,230	50.7	1,444.3
Location other than home	2,342,396	31.0	883.3
Unknown	1,383,268	18.3	516.6

Data Source: National Hospital Ambulatory Medical Care Survey - Emergency Department, 1993-2000.

Figure 3.5. Location of Nonfatal Falls Resulting in Emergency Department Visits. Average Annual Rate (per 100,000 persons), U.S., 1993-2000.

Data Source: National Hospital Ambulatory Medical Care Survey - Emergency Department, 1993-2000.

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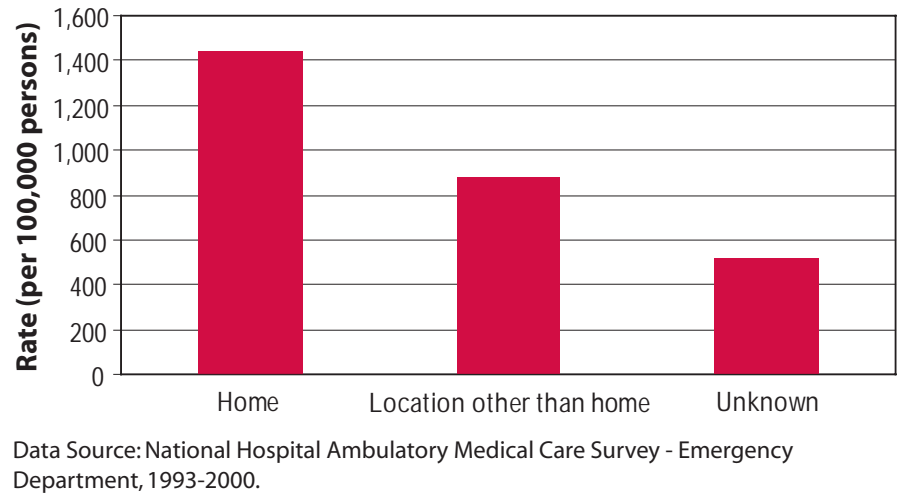
Figure 3.6. Nonfatal Falls in the Home Resulting in Emergency Department Visits. Average Annual Rate (per 100,000 persons), by Age Group and Sex, U.S., 1993-2000.

Data Source: National Hospital Ambulatory Medical Care Survey - Emergency Department, 1993-2000.
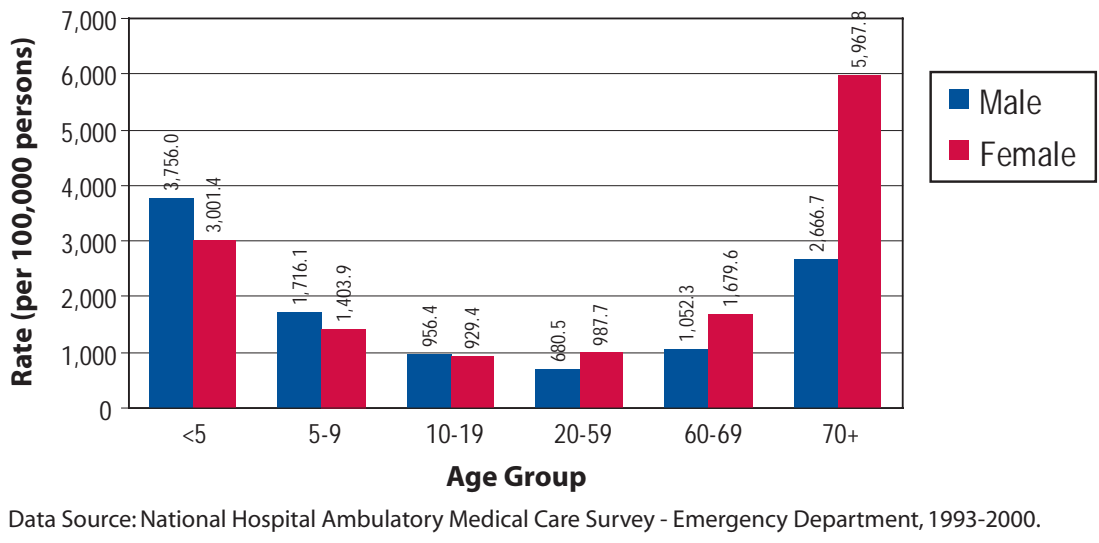
Summary — Falls alone account for one-third of all unintentional home injury deaths, more than 40 percent of all nonfatal home injuries, and more than one-third of all injuries resulting in an emergency department visit. In addition, more than half of all fatal and nonfatal falls occur in the home, supporting the need to focus fall prevention efforts in the home environment.

Older adults have the highest rates of death and nonfatal injury due to falls. Fall intervention programs have been tested among populations of community-dwelling older adults, as well as older adults in nursing homes and residential care facilities, and some of these interventions have been successful in reducing falls incidence. The challenge is to disseminate these proven interventions to older adult populations, which is especially important from a preventive standpoint because this demographic group is rapidly growing. In addition, there is always a need for continued research to find new and better interventions.

Poisonings

Deaths — Unintentional poisonings are the second leading cause of unintentional home injury death in the United States, accounting for more than one-fourth of all home injury deaths. An average of 4,833 people in the United States die each year of an unintentional poisoning that occurs at home **(Table 3.5)**.

Table 3.5. Location of Fatal Poisonings. Average Annual Number, Percentage and Rate (per 100,000 persons), U.S., 1992-1999.

Location	Number	Percentage	Rate
Home	4,833	50.6	1.83
Location other than home	1,500	15.7	0.57
Unknown	3,211	33.6	1.22

Data Source: National Vital Statistics System, 1992-1999.

Figure 3.7. Location of Fatal Poisonings. Average Annual Rate (per 100,000 persons), U.S., 1992-1999.
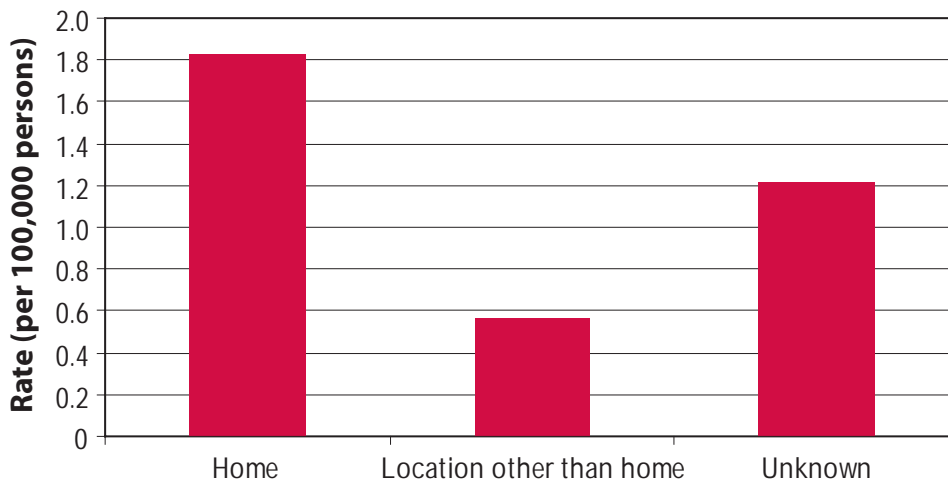
Data Source: National Vital Statistics System, 1992-1999.

Just over half of all poisoning deaths occur in the home (50.6%), compared with 15.7 percent that occur in a location other than the home **(Table 3.5)**. More than one-third of all poisoning deaths (33.6%) could not be linked to a location in the National Vital Statistics System **(Table 3.5)**. Therefore, more poisoning deaths could have occurred in the home, but remain unidentified due to the lack of standardized guidelines for recording the location of injury on death certificates and medical records.

Many of the poisoning deaths occurring at home are due to unintentional overdoses of heroin (23.8%), appetite depressants (21.9%), local anesthetics such as cocaine (12.3%), and other substances such as amphetamines, caffeine, antidepressants and alcohol (21.2%) **(Table 3.6)**. Nearly three percent of the unintentional poisoning deaths were also due to exhaust gas from combustion engines, such as from cars not in transit.

Table 3.6. Unintentional Home Injury Deaths Due to Poisoning, by External Cause. Average Annual Number and Percentage, U.S., 1992-1998[1].

Description of Substance (External Cause of Injury Code)	Number of Deaths	Percentage of Total
Heroin (E850.0)	**1,087**	**23.8**
Central appetite depressants (E858.8)	**998**	**21.9**
Unspecified drug (E858.9)	**821**	**18.0**
Local anesthetics (e.g., cocaine) (E855.2)	**562**	**12.3**
Motor vehicle exhaust gas (E868.2)	**132**	**2.9**
Miscellaneous[2]	**966**	**21.2**

[1]Note that the values in the table exclude deaths from 1999 due to coding changes; therefore, totals may not add up to totals in other tables.
[2]Category includes descriptions such as psychostimulants (e.g., amphetamines, caffeine), antidepressants and alcohol.
Data Source: National Vital Statistics System, 1992-1998.

The majority of people who die from unintentional poisonings that occur at home are young- and middle-aged adults **(Figure 3.8)**. Overall rates are highest for adults between 40 and 49 years of age followed by adults between 30 and 39 **(Table 3.7)**. The poisoning death rate for males is more than three times greater than the rate for females **(Figure 3.8, Figure 3.9)**.

Figure 3.8. Fatal Poisonings in the Home. Average Annual Rate (per 100,000 persons), by Age Group and Sex, U.S., 1992-1999.
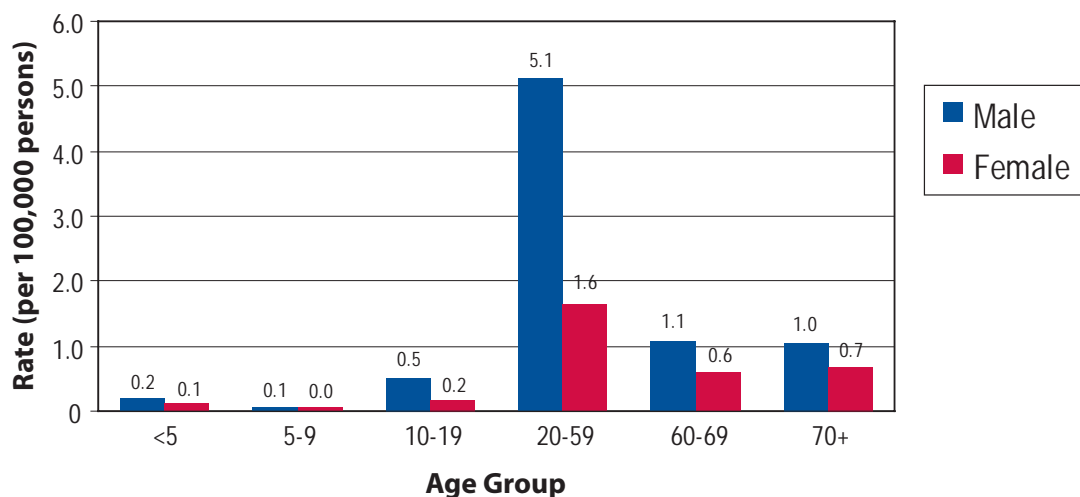
Data Source: National Vital Statistics System, 1992-1999.

Table 3.7. Fatal Poisonings in the Home. Average Annual Number and Rate (per 100,000 persons), by Adult Age Groups, U.S., 1992-1999.

Age Group	Total		Male		Female	
	Number	Rate	Number	Rate	Number	Rate
20-29	676	1.83	530	2.84	146	0.80
30-39	1,672	3.85	1,250	5.79	422	1.93
40-49	1,605	4.14	1,204	6.31	401	2.04
50-59	428	1.64	286	2.27	142	1.05

Data Source: National Vital Statistics System, 1992-1999.

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Nonfatal Injuries — Nonfatal poisonings are the fifth leading cause of nonfatal unintentional home injury requiring medical advice and/or resulting in lost school/work days. Nearly 65 percent of all poisoning injuries occur in the home, translating to an average of 726,296 poisoning events in the home each year in the United States **(Table 3.8, Figure 3.9)**.

Table 3.8. Location of Nonfatal Poisonings. Average Annual Number, Percentage and Rate (per 100,000 persons), U.S., 2000-2001.

Location	Number	Percentage	Rate
Home	726,296	64.6	263.9
Location other than home	367,954	32.7	133.6
Unknown	30,074	2.7	10.9

Data Source: National Health Interview Survey, 2000-2001.

Figure 3.9. Location of Nonfatal Poisonings. Average Annual Rate (per 100,000 persons), U.S., 2000-2001.
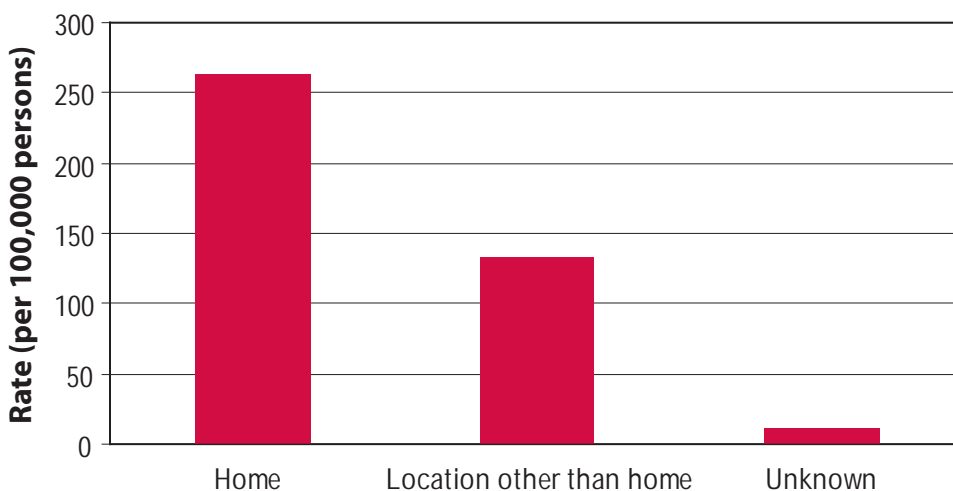
Data Source: National Health Interview Survey, 2000-2001.

Unlike poisoning deaths where adults have the highest rates, nonfatal poisoning rates are highest among children younger than 5 **(Figure 3.10)**. Childhood poisoning exposures are different from those for adults. The most common childhood poisonings are from ingested household products, such as cleaning substances, beauty products and medications. Rates of nonfatal poisoning injury occurring in the home are similar for males and females younger than 5 **(Figure 3.10)**. Sex differences are not expected at this age due to the normal developmental stage for children to explore their environments and put things in their mouths. With increasing age, females have higher nonfatal poisoning rates, exceeding the rates of males more than six-fold for ages 10 to 19 and 60 to 69. Some of these poisonings may also be suicide attempts not noted as such in the NHIS interviews.

Figure 3.10. Nonfatal Poisonings in the Home. Average Annual Rate (per 100,000 persons), by Age Group and Sex, U.S., 2000-2001.

Data Source: National Health Interview Survey, 2000-2001.
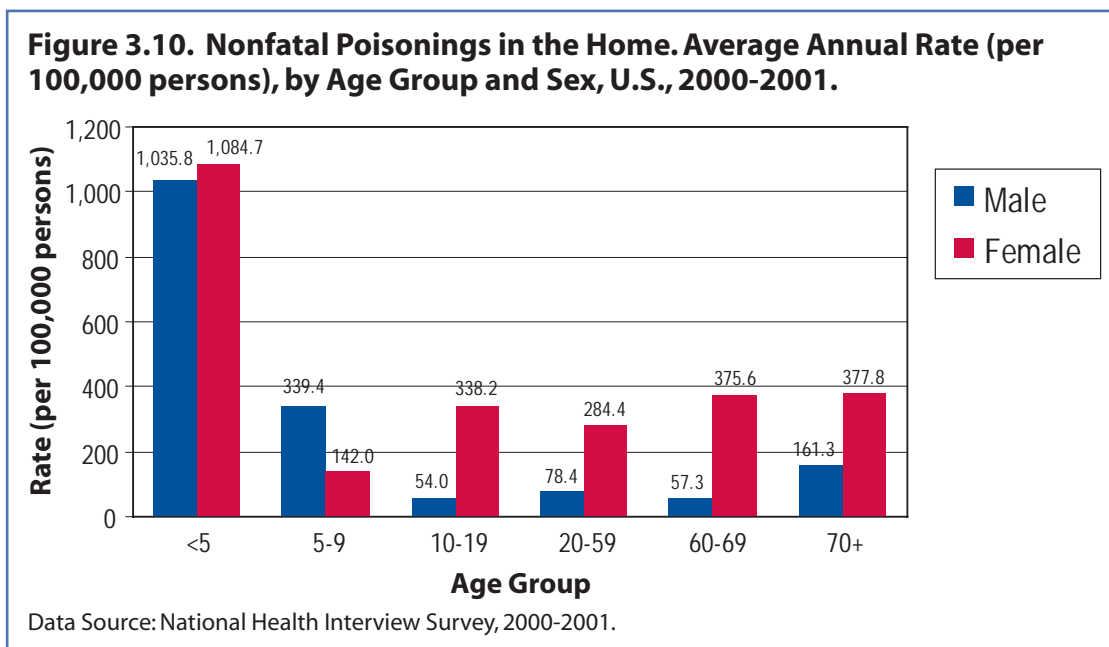
The nonfatal statistics presented in this section represent only two years of data (2000–2001) from the National Health Interview Survey (NHIS). Within the NHIS, poisoning data were stored in separate files for years 1997-1999 and 2000-2001. In the 1997-1999 poisoning file, there was no information on the intent (unintentional versus intentional) or location (home/other than home/unknown) of the poisoning injury. Therefore, the file could not be manipulated to capture statistics for unintentional poisonings that occurred at home.

Emergency Department Visits — An average of 236,244 poisonings occurring at home are seen in the emergency department each year in the United States, yielding an annual emergency department rate for unintentional home poisonings of 88.5 per 100,000 persons **(Table 3.9)** and making it one of the top ten leading causes of unintentional home injury resulting in an emergency department visit.

Table 3.9. Location of Nonfatal Poisonings Resulting in Emergency Department Visits. Average Annual Number, Percentage and Rate (per 100,000 persons), U.S., 1993-2000.

Location	Number	Percentage	Rate
Home	236,244	31.6	88.5
Location other than home	105,551	14.1	39.7
Unknown	404,677	54.2	152.8

Data Source: National Hospital Ambulatory Medical Care Survey - Emergency Department, 1993-2000.

Figure 3.11. Location of Nonfatal Poisonings Resulting in Emergency Department Visits. Average Annual Rate (per 100,000 persons), U.S., 1993-2000.
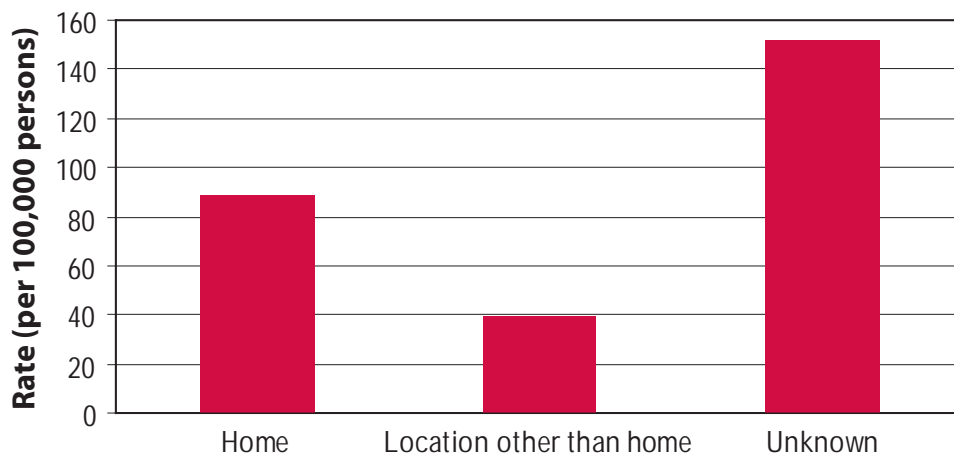
Data Source: National Hospital Ambulatory Medical Care Survey - Emergency Department, 1993-2000.

The location of poisonings resulting in an emergency department visit could not be identified in the National Hospital Ambulatory Medical Care Survey - Emergency Department for more than half of all events (54.2%) **(Table 3.9, Figure 3.11)**. Of those poisonings where the location was known, nearly one-third occurred at home (31.6%) and the remaining occurred in a location other than the home (14.1%). Children younger than 5 have the highest poisoning rates requiring emergency department care, compared with all other age groups **(Figure 3.12)**. Similar to nonfatal injuries, the rationale for young children having the highest rates is due to normal developmental characteristics of children that involve exploring their environments and putting things into their mouths. These types of injuries signal the importance of preventive strategies associated with packaging and storage of poisonous substances.

Figure 3.12. Nonfatal Poisonings in the Home Resulting in Emergency Department Visits. Average Annual Rate (per 100,000 persons), by Age Group and Sex, U.S., 1993-2000.
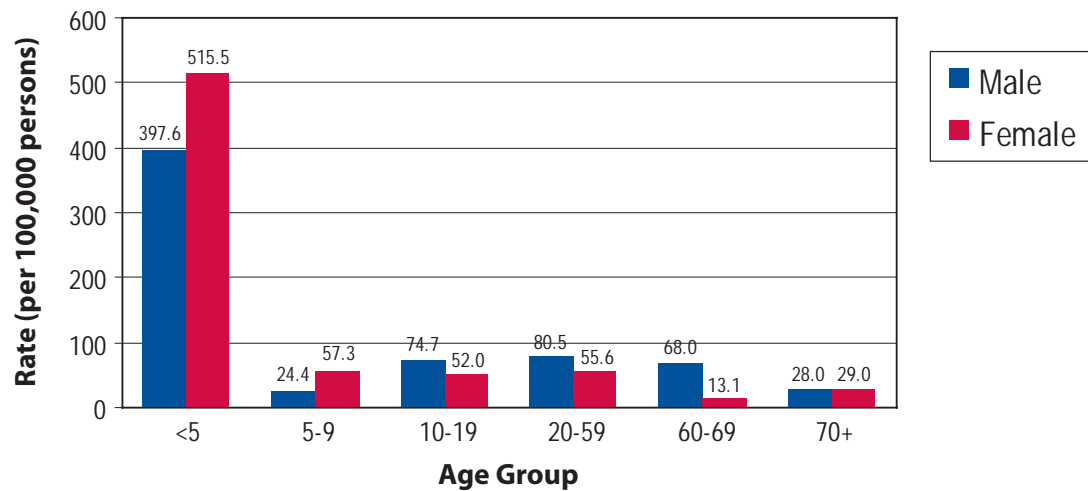
Data Source: National Hospital Ambulatory Medical Care Survey - Emergency Department, 1993-2000.

Summary — Poisonings are the second leading cause of home injury death, primarily affecting young and middle-aged adults who unintentionally overdose on drugs such as heroin, other painkillers or appetite depressants. Poisonings are the fifth leading cause of nonfatal home injuries and the ninth leading cause of home injuries resulting in an emergency department visit. Nonfatal rates are highest among children less than five years of age. Some of these poisonings are likely the result of ingesting household products not properly stored, but we are unable to determine the exact percentage from the data source.

Understanding the magnitude of poisoning deaths and nonfatal injuries is hindered by the completeness and organization of national reporting systems. As explained for deaths above, the intent and location of poisonings could not be identified over a three-year period (1997-1999) in the National Vital Statistics System due to differences in how 1997-1999 and 2000-2001 datasets were created and organized. In addition, the location of unintentional poisonings resulting in emergency department visits could not be identified in 54.2 percent of all poisoning cases reported in the National Hospital Ambulatory Medical Care Survey- Emergency Department. Therefore, the statistics presented in this section for poisonings underestimate the true magnitude of the problem and should be interpreted with that understanding.

Most poisoning prevention efforts have focused on preventing home poisonings among children, although this only addresses part of the home poisoning problem. Since the Poison Prevention Packaging Act of 1970, which authorized the U.S. Consumer Product Safety Commission to regulate packaging for toxic substances used in and around the home, child-resistant packaging has been the only prevention strategy documented in the public health literature to have successfully reduced unintentional poisoning deaths and nonfatal injuries among children. The effects of poison prevention packaging, for those substances covered by the law, have been dramatic in reducing unintentional poisonings in young children.

Fires and Burns

Deaths — Nearly 90 percent of all fatalities due to a burn or inhalation injury are associated with residential fires **(Table 3.10)**. An average of 3,402 persons die each year as a result of a fire or burn injury that occurred in the home, for an annual rate of 1.29 per 100,000 persons **(Figure 3.13)**. Home fire and burn injuries are the third leading cause of home injury death in the United States. Most home injury deaths due to fires are the result of the inhalation of smoke, fumes or carbon monoxide from uncontrolled residential fires (68.7%), followed by burns from uncontrolled residential fires (15.2%) **(Table 3.11)**.

Table 3.10. Location of Fatal Fires/Burns. Average Annual Number, Percentage and Rate (per 100,000 persons), U.S., 1992-1999.

Location	Number	Percentage	Rate
Home	3,402	89.7	1.29
Location other than home	249	6.6	0.09
Unknown	142	3.7	0.05

Data Source: National Vital Statistics System, 1992-1999.

Figure 3.13. Location of Fatal Fires/Burns. Average Annual Rate (per 100,000 persons), U.S., 1992-1999.
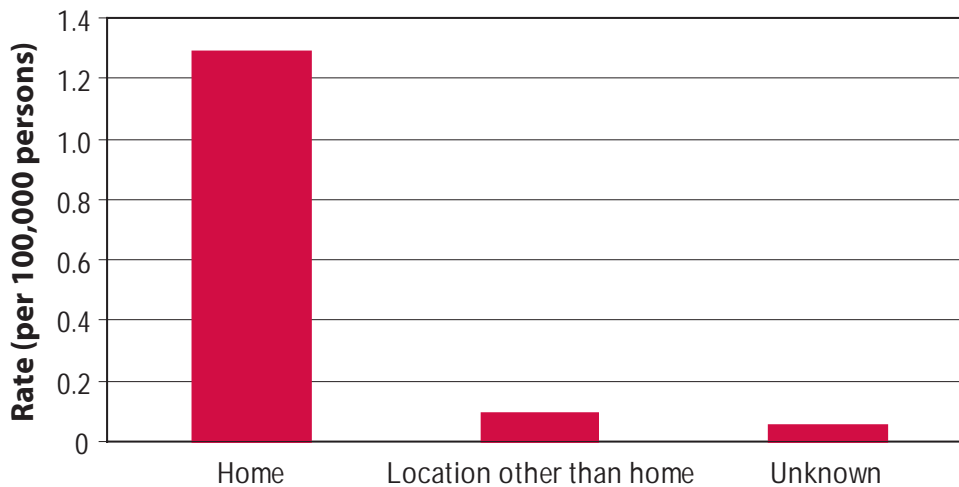
Data Source: National Vital Statistics System, 1992-1999.

Table 3.11. Unintentional Home Injury Deaths Due to Fires/Burns, by External Cause. Average Annual Number and Percentage, U.S., 1992-1998[1].

Description of Injury (External Cause of Injury Code)	Number of Deaths	Percentage of Total
Smoke, fumes or carbon monoxide from uncontrolled residential fire (E890.2)	2,380	68.7
Burns from uncontrolled residential fire (E890.3)	529	15.2
Injury (other than inhalation or burns) from an unspecified residential fire (E899.0)	68	2.0
Injury from ignition of clothing from a controlled residential fire (i.e., from a stove or other heating source) (E893.0)	61	1.8
Injury from a hot substance or object, caustic or corrosive material and steam (E924.0)	61	1.8
Miscellaneous[2]	362	10.5

[1]Note that the values in the table exclude deaths from 1999 due to coding changes; therefore, totals may not add up to totals in other tables.
[2]Category includes descriptions such as fires caused by such objects as candles, cigars, cigarettes, matches or fireplaces/stoves.
Data Source: National Vital Statistics System, 1992-1998.

Rates of death for fire-related home injuries are high for young children, decrease among adolescents, and increase again for adults 20 and older **(Figure 3.14)**. Rates significantly increase for adults 70 and older, surpassing the rates for young children. Young children and older adults are at greatest risk of fire-related death due in part to mobility and judgment issues that hinder them from efficiently exiting homes that are on fire. In each age group, males have higher death rates than females.

Figure 3.14. Fatal Fires/Burns in the Home. Average Annual Rate (per 100,000 persons), by Age Group and Sex, U.S., 1992-1999.
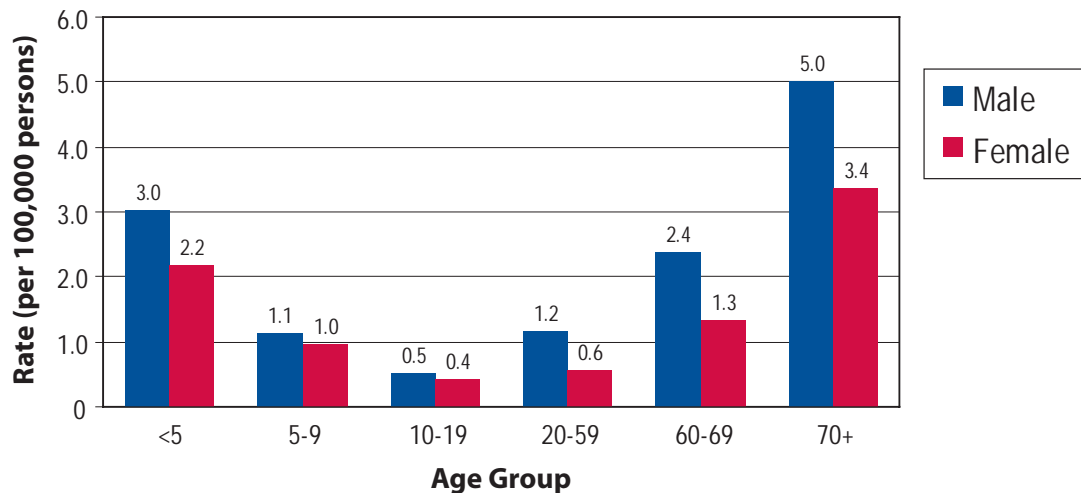
Data Source: National Vital Statistics System, 1992-1999.

Nonfatal Injuries — An average of 261,326 nonfatal fire and burn injuries occur in the home every year in the United States **(Table 3.12)**, making it one of the top ten causes of nonfatal home injuries where medical advice was sought and/or which resulted in lost school/work days.

Table 3.12. Location of Nonfatal Fires/Burns. Average Annual Number, Percentage and Rate (per 100,000 persons), U.S., 1997-2001.

Location	Number	Percentage	Rate
Home	261,326	57.1	96.4
Location other than home	207,597	42.9	76.8
Unknown	0	0	0

Data Source: National Health Interview Survey, 1997-2001.

Figure 3.15. Location of Nonfatal Fires/Burns. Average Annual Rate (per 100,000 persons), U.S., 1997-2001.
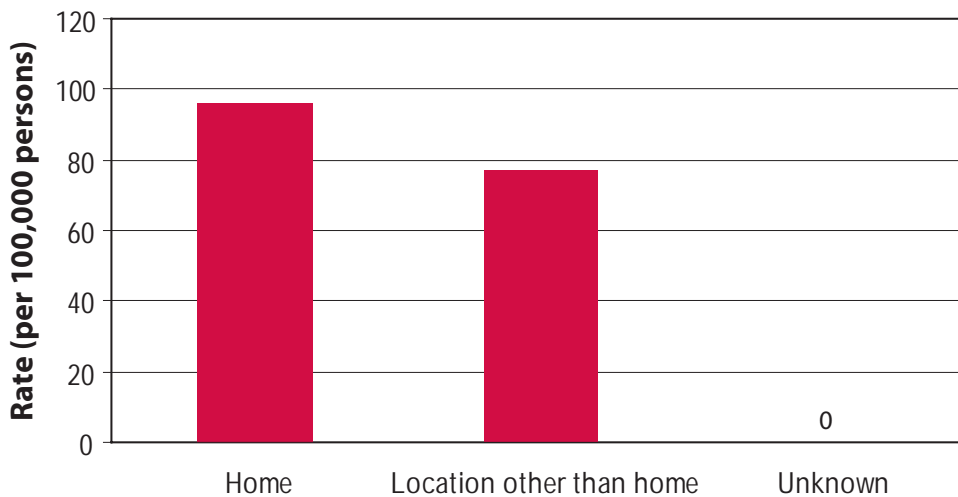
Data Source: National Health Interview Survey, 1997-2001.

The majority of nonfatal unintentional fire and burn injuries occur in the home (57.1%), and another 42.9 percent occur in a location other than the home **(Table 3.12, Figure 3.15)**. Unlike other causes of nonfatal injury, the National Health Interview Survey captured the location of all unintentional fire-related nonfatal events.

Rates of nonfatal residential fire injuries are highest among male children younger than 5 **(Figure 3.16)**. Similar to the rationale for residential fire deaths, this group may be at greatest risk due in part to limited mobility or not knowing how to respond to a home fire (e.g., hiding in a closet or under a bed rather than exiting the building). In addition, children may also fail to awaken to the smoke alarm.

Figure 3.16. Nonfatal Fires/Burns in the Home. Average Annual Rate (per 100,000 persons), by Age Group and Sex, U.S., 1997-2001.
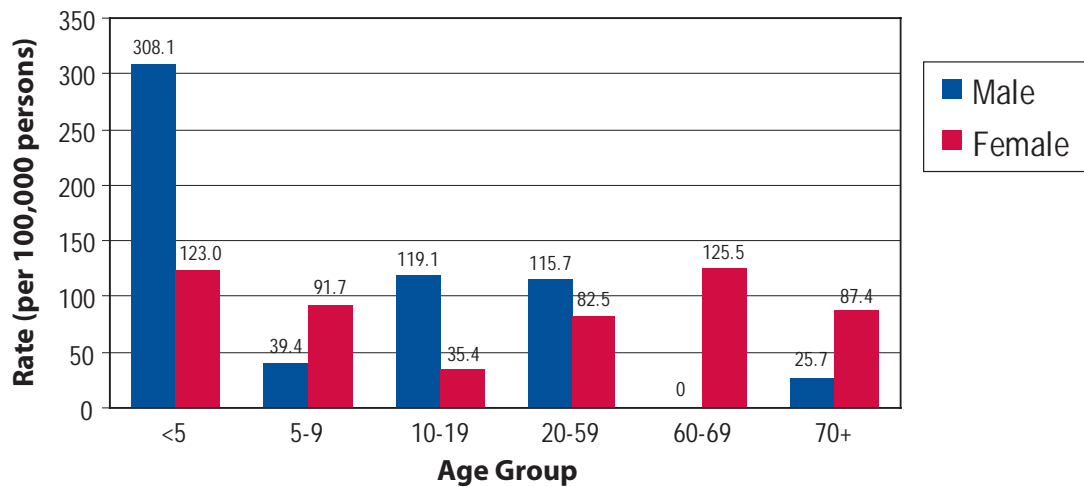
Data Source: National Health Interview Survey, 1997-2001.

Emergency Department Visits — Emergency department care is sought for more than 304,000 injuries each year as a result of a residential fire, yielding 54 percent of all emergency department visits for fire-related injuries **(Table 3.13)**. Note that the location of 20.4 percent of all fire and burn injuries could not be identified from the National Hospital Ambulatory Medical Care Survey- Emergency Department (NHAMCS-ED) **(Table 3.13, Figure 3.17)**. In addition, because many serious burn injuries may be diverted directly to burn units, bypassing the emergency department, rates of burns requiring medical attention are likely underestimated in the NHAMCS-ED.

Table 3.13. Location of Nonfatal Fires/Burns Resulting in Emergency Department Visits. Average Annual Number, Percentage and Rate (per 100,000 persons), U.S., 1993-2000.

Location	Number	Percentage	Rate
Home	304,434	54.0	114.8
Location other than home	143,995	25.6	54.4
Unknown	114,840	20.4	42.9

Data Source: National Hospital Ambulatory Medical Care Survey -- Emergency Department, 1993-2000.

Figure 3.17. Location of Nonfatal Fires/Burns Resulting in Emergency Department Visits. Average Annual Rate (per 100,000 persons), U.S., 1993-2000.
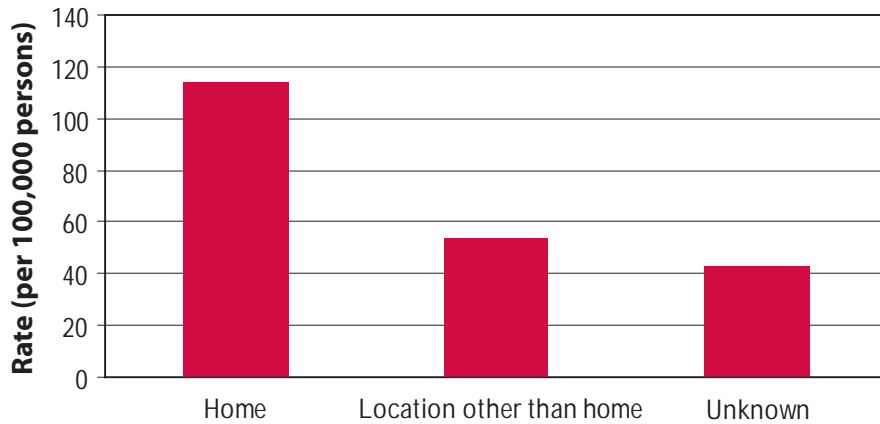
Data Source: National Hospital Ambulatory Medical Care Survey -- Emergency Department, 1993-2000.

Males and females younger than 5 have dramatically higher rates of residential fire-related injuries resulting in an emergency department visit than all other age groups **(Figure 3.18)**.

Figure 3.18. Nonfatal Fires/Burns in the Home Resulting in Emergency Department Visits. Average Annual Rate, by Age Group and Sex, U.S., 1993-2000.
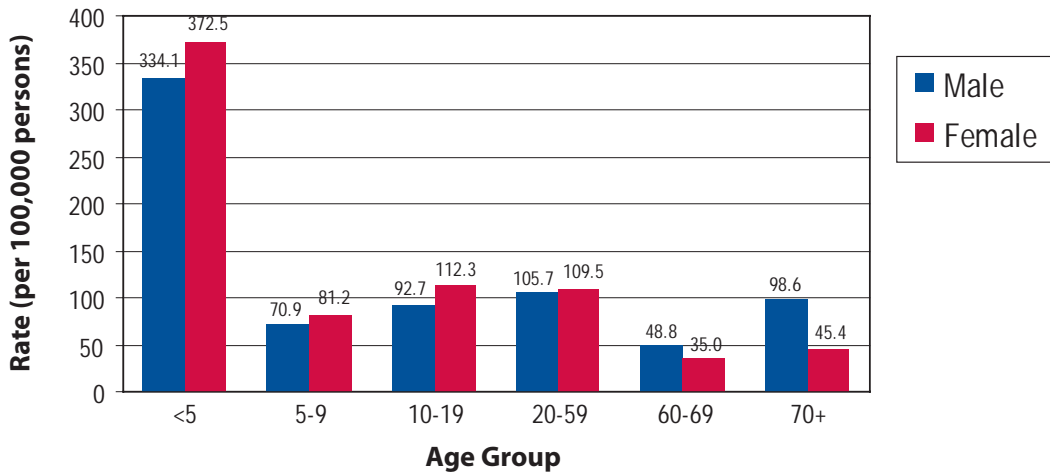
Data Source: National Hospital Ambulatory Medical Care Survey -- Emergency Department, 1993-2000.

Summary — Fire and burn injuries are the third leading cause of home injury death and the ninth leading cause of nonfatal injuries. Nearly 90 percent of all fire-related deaths are the result of residential fires, and the majority of fatalities (68.7%) are from smoke inhalation or toxic gases, rather than from burns. Burns comprise just over 15 percent of all residential fire fatalities.

Information from other research and the National Fire Reporting System reveals that most home fires begin in the kitchen. Cooking is the leading cause of residential fires and fire-related nonfatal injuries. However, smoking is the leading cause of residential fire-related deaths. Although these are the most common causes of residential fire deaths and nonfatal injuries, numerous other causes exist, such as space heaters, clothes dryers, home extension cords, and children playing with matches and lighters. Smoke alarms are reliable and effective devices that are shown to reduce unintentional injuries due to home fires, if the smoke alarms are well maintained and functioning properly. The Home Safety Council and numerous other safety organizations recommend increased use of home fire sprinkler systems, which when used in conjunction with smoke alarms can substantially reduce the risk of dying in a home fire.

3

Choking and Suffocation

Deaths — Deaths due to unintentional choking and suffocation injuries are the fourth leading cause of unintentional home injury death in the United States, resulting in an average of 1,092 fatalities each year.

Nearly 25 percent of all choking and suffocation injury deaths occur in the home, while 13.1 percent occur in a location other than the home **(Table 3.14)**. Note that the location of nearly two-thirds of the fatal choking and suffocation injuries could not be identified from the National Vital Statistics System **(Figure 3.19)**. The missing location information is likely a reflection of the variability in how such information is recorded in the original documents (i.e., death certificates and medical records). Routine data collection for the place of injury occurrence is needed in both death and medical record systems to improve home injury death (and nonfatal) estimates.

Table 3.14. Location of Fatal Chokings/Suffocations. Average Annual Number, Percentage and Rate (per 100,000 persons), U.S., 1992-1999.

Location	Number	Percentage	Rate
Home	1,092	24.6	0.41
Location other than home	582	13.1	0.22
Unknown	2,759	62.2	1.05

Data Source: National Vital Statistics System, 1992-1999.

Figure 3.19. Location of Fatal Chokings/Suffocations. Average Annual Rate (per 100,000 persons), U.S., 1992-1999.
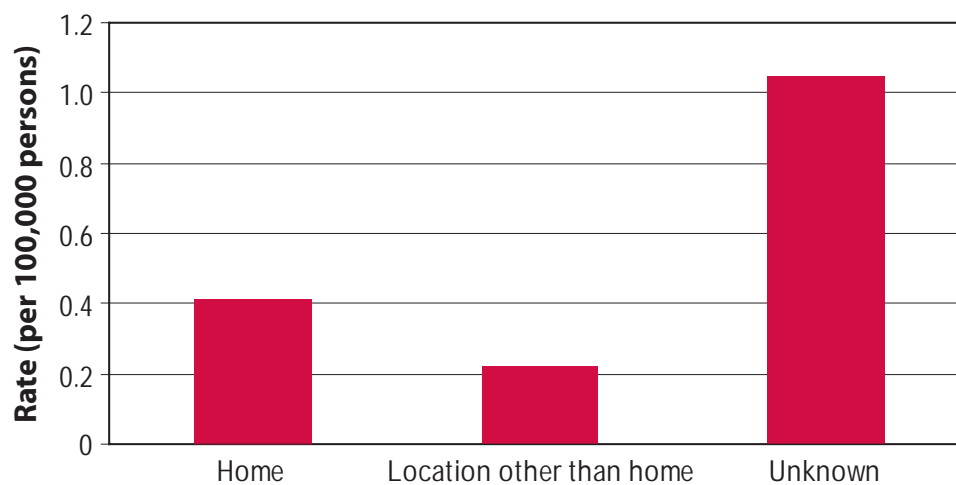
Data Source: National Vital Statistics System, 1992-1999.

Unintentional home injury deaths due to choking and suffocation include mechanisms that block breathing, either by inhalation or ingestion of food or other objects, or by something on top of the mouth or nose that prevents normal breathing, such as being suffocated by bedding materials or plastic bags **(Table 3.15)**. Note that choking and suffocation deaths as presented in this report do not include Sudden Infant Death Syndrome (SIDS) cases.

Table 3.15. Unintentional Home Injury Deaths Due to Choking/Suffocation, by External Cause. Average Annual Number and Percentage, U.S., 1992-1998[1].

Description of Injury (External Cause of Injury Code)	**Number of Deaths**	**Percentage of Total**
Inhalation and ingestion of food causing obstruction of respiratory tract or suffocation (E911.0)	**348**	**32.4**
Unintentional mechanical suffocation, by other specified means (e.g., accidental hanging, except in bed or cradle) (E913.8)	**259**	**24.1**
Accidental mechanical suffocation in bed or cradle (E913.0)	**172**	**16.0**
Accidental mechanical suffocation, by unspecified means, excluding food (E913.9)	**163**	**15.2**
Inhalation and ingestion of an object (e.g., marble) causing obstruction of respiratory tract or suffocation (E912.0)	**88**	**8.2**
Accidental mechanical suffocation by plastic bag (E913.1)	**32**	**3.0**
Miscellaneous[2]	**13**	**1.2**

[1]Note that the values in the table exclude deaths from 1999 due to coding changes; therefore, totals may not add up to totals in other tables.
[2]Category includes descriptions such as mechanical suffocation by falling earth or due to lack of air in a closed place (e.g., refrigerator).
Data Source: National Vital Statistics System, 1992-1998.

The rate of choking and suffocation death is highest among the very young, lowest among children between 5 and 9, and increases with age thereafter **(Figure 3.20)**. The fact that many deaths are concentrated among the very young implies that the phenomenon may be related to developmental issues, such as the tendency to put items in one's mouth, and the lack of ability to chew/swallow certain types of food and distinguish food from other objects. Choking and suffocation deaths among adults 70 and older may also be due to problems in chewing and swallowing foods, or swallowing in general, possibly as a consequence of illness or disability. Across all age groups, males have higher death rates from choking and suffocation than females **(Figure 3.20)**.

Figure 3.20. Fatal Chokings/Suffocations in the Home. Average Annual Rate (per 100,000 persons), by Age Group and Sex, U.S., 1992-1999.
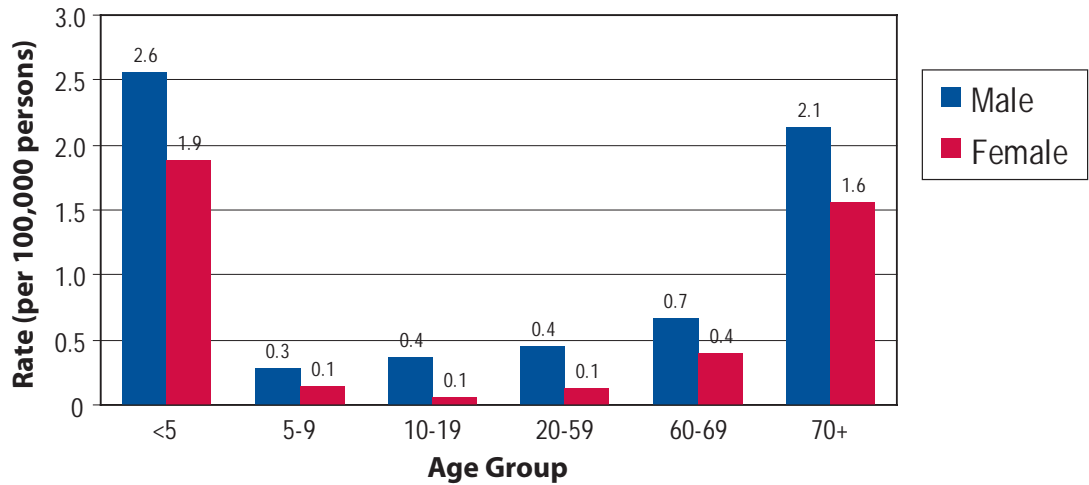
Data Source: National Vital Statistics System, 1992-1999.

Nonfatal Injuries — Although choking and suffocation injuries are not a leading cause of unintentional nonfatal home injury in the United States, an annual average of 18,101 home choking and suffocation injuries occurred between 1997 and 2001, for an annual rate of 6.7 per 100,000 persons **(Figure 3.21)**. More than two-thirds of all nonfatal unintentional choking and suffocation injuries occurred at home **(Table 3.16)**.

Table 3.16. Location of Nonfatal Chokings/Suffocations. Average Annual Number, Percentage and Rate (per 100,000 persons), U.S.,1997-2001.

Location	Number	Percentage	Rate
Home	18,101	68.6	6.7
Location other than home	8,270	31.4	3.1
Unknown	0	0	0

Data Source: National Health Interview Survey, 1997-2001.

Figure 3.21. Location of Nonfatal Chokings/Suffocations. Average Annual Rate (per 100,000 persons), U.S., 1997-2001.

[Bar chart showing Rate (per 100,000 persons) on the y-axis from 0 to 8.0. Home: approximately 6.7; Location other than home: approximately 3.1; Unknown: 0]
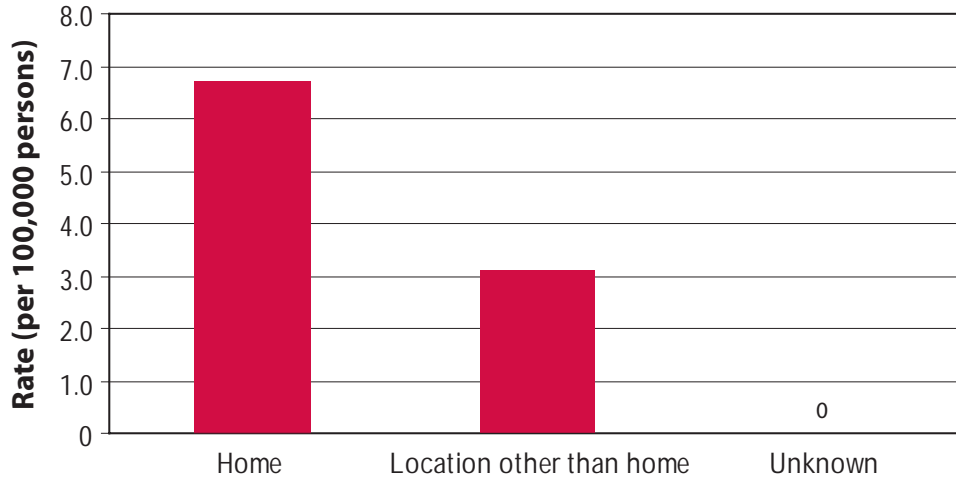
Data Source: National Health Interview Survey, 1997-2001.

Children younger than 5 experience the highest rates of nonfatal home choking and suffocation injuries, compared with all other age groups **(Figure 3.22)**. Rates in this age group are similar for both males and females, suggesting that the incidents are functions of normal developmental behavior where young children tend to put objects in their mouths.

Figure 3.22. Nonfatal Chokings/Suffocations in the Home. Average Annual Rate (per 100,000 persons), by Age Group and Sex, U.S., 1997-2001.

[Bar chart showing Rate (per 100,000 persons) on the y-axis from 0 to 50, by Age Group on the x-axis. Legend: Male (blue), Female (red).
<5: Male 44.8, Female 43.7
5-9: Male 33.1, Female 0
10-19: Male 0, Female 10.4
20-59: Male 0, Female 2.4
60-69: Male 0, Female 0
70+: Male 23.1, Female 0]
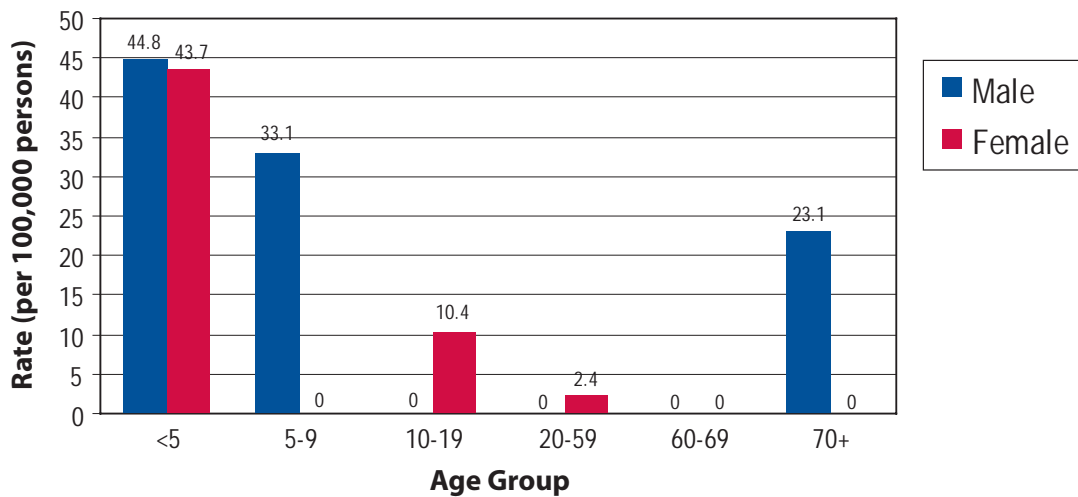
Data Source: National Health Interview Survey, 1997-2001.

Emergency Department Visits — An average of 91,374 choking and suffocation injuries resulting in an emergency department visit occur each year in the United States, of which 40.3 percent occur at home, 2.5 percent occur in a location other than the home, and the majority (57.2%) occur in an unknown location **(Table 3.17)**. The high percentage of missing location data is a reflection of emergency departments not collecting this information when a patient presents with an injury as the primary reason for the visit, a presenting complaint, or a diagnosis. Subsequently, the location is not transferred to the emergency department utilization survey used to compile the National Hospital Ambulatory Medical Care Survey- Emergency Department database.

The annual average rate of choking and suffocation home injuries resulting in an emergency department visit is 13.9 per 100,000 persons **(Figure 3.23)**. Although choking and suffocation injuries are not a leading cause of emergency department home injury, more than 36,000 incidents are treated in the emergency department every year.

Similar to nonfatal choking and suffocation home injuries, the rates for events requiring emergency department care are highest for children younger than 5 **(Figure 3.24)**.

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Table 3.17. Location of Nonfatal Chokings/Suffocations Resulting in Emergency Department Visits. Average Annual Number, Percentage and Rate (per 100,000 persons), U.S., 1993-2000.

Location	Number	Percentage	Rate
Home	36,806	40.3	13.9
Location other than home	2,312	2.5	0.9
Unknown	52,256	57.2	19.6

Data Source: National Hospital Ambulatory Medical Care Survey -- Emergency Department, 1993-2000.

Figure 3.23. Location of Nonfatal Chokings/Suffocations Resulting in Emergency Department Visits. Average Annual Rate (per 100, 000 persons), U.S., 1993-2000.
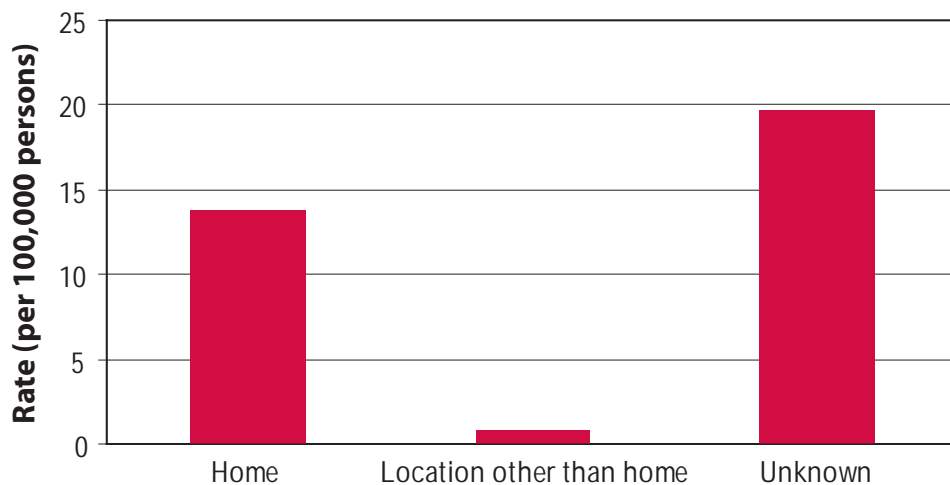
Data Source: National Hospital Ambulatory Medical Care Survey -- Emergency Department, 1993-2000.

Figure 3.24. Nonfatal Chokings/Suffocations in the Home Resulting in Emergency Department Visits. Average Annual Rate (per 100,000 persons), by Age Group and Sex, U.S., 1993-2000.

Data Source: National Hospital Ambulatory Medical Care Survey -- Emergency Department, 1993-2000.

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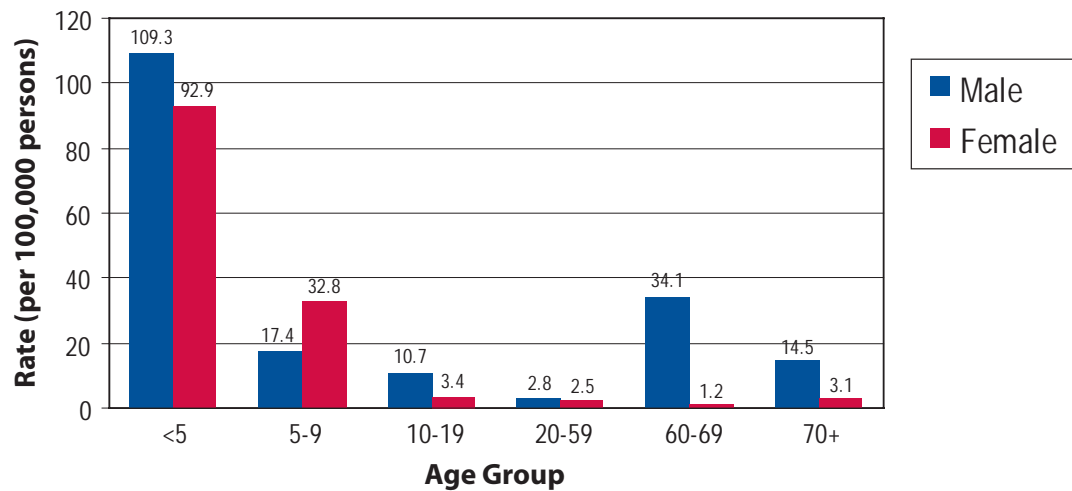
Summary — Deaths due to choking and suffocation are the fourth leading cause of home injury death in the United States. More than 40 percent of the choking and suffocation deaths are due to the inhalation or ingestion of food items (e.g., hard candy) or nonfood objects (e.g., coins) that block breathing. Another 19 percent are due to suffocating in bedding materials or by a plastic bag. Young children and older adults have the highest rates of fatal choking and suffocation injuries. Young children are at increased risk because of their tendency to place objects in their mouths, in addition to poor chewing ability and narrow airways, compared with older children and adults. Older adults may also have problems with chewing due to dental problems and have more difficulty swallowing, increasing the chances of choking. In addition, people who live alone may not be able to get the help they need when they do choke.

Choking and suffocation injuries that do not result in death are not among the leading causes of nonfatal home injuries. However, for every choking-related death, there is an average of nearly 20 nonfatal choking and suffocation injuries that occur in the home that require medical care and/or result in missing days of school or work.

A significant percentage of data for the location of choking and suffocation injuries is missing. In particular, 62.2 percent of the location of fatal choking and suffocation injuries and 57.2 percent of the location of choking and suffocation injuries resulting in emergency department visits are missing. The magnitude of these missing data emphasizes the need to standardize the place of occurrence for injury events on all death and medical record systems. Without this information, it is difficult to develop prevention measures specific to certain environments, including the home.

The Centers for Disease Control and Prevention suggest several public health strategies that can reduce the risk of choking in children, including public education (e.g., increase awareness of the importance of adult supervision when young children are eating and playing), product-safety labeling (e.g., inform consumers of potential choking hazards through age-appropriate labeling), changes in product design (e.g., eliminate small parts of toys) and the instruction of parents and caregivers in providing first aid or appropriately using the Heimlich Maneuver for choking.

Drownings and Submersions

Deaths — Drownings are the fifth leading cause of home injury death in the United States, accounting for an average of 823 deaths per year **(Table 3.18, Figure 3.25)**. Nearly one-fourth (22.7%) of all drownings occur in the home or surrounding premises, while the majority (68.3%) occur in a location other than the home, most frequently a natural body of water.

More than 45 percent of the circumstances surrounding home drownings are classified as "other accidental drowning or submersion" incidents, which includes the involvement of swimming pools. The percentage of drownings that actually occur in swimming pools, however, is unknown; the external causes of injury classification system (International Classification of Diseases, 9th Revision) used to code the circumstances surrounding the injury does not delineate events specifically involving swimming pools. Another 33.1 percent of the home drownings occurred in bathtubs, while 17.6 percent involved "unspecified" circumstances, and 4.1 percent occurred while engaged in a sport or recreational activity **(Table 3.19)**.

Table 3.18. Location of Drownings/Fatal Submersions. Average Annual Number, Percentage and Rate (per 100,000 persons), U.S., 1992-1999.

Location	Number	Percentage	Rate
Home	823	22.7	0.31
Location other than home	2,483	68.3	0.09
Unknown	327	9.0	0.12

Data Source: National Vital Statistics System, 1992-1999.

Figure 3.25. Location of Drownings/Fatal Submersions. Average Annual Rate (per 100,000 persons), U.S., 1992-1999.
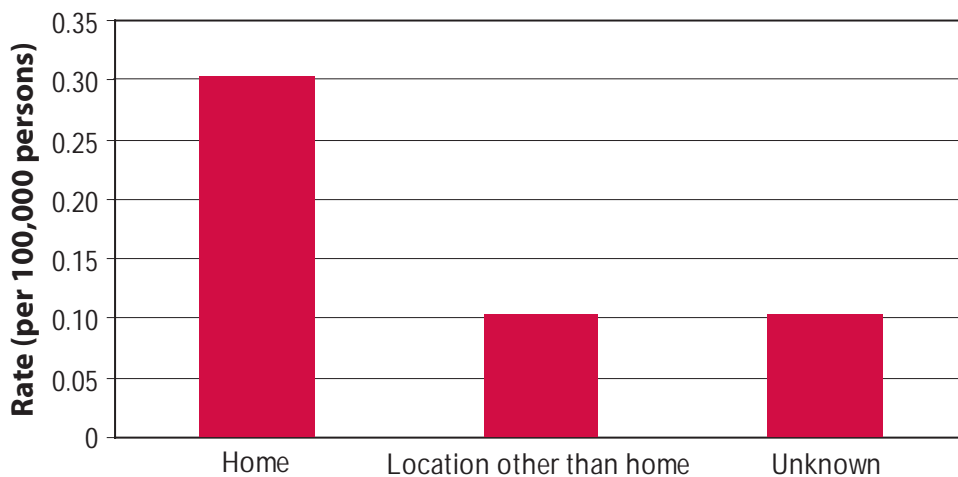
Data Source: National Vital Statistics System, 1992-1999.

Table 3.19. Unintentional Home Injury Deaths Due to Drownings/Submersions, by External Cause. Average Annual Number and Percentage, U.S., 1992-1998[1].

Description of Circumstances (External Cause of Injury Code)	Number of Deaths	Percentage of Total
Other accidental drowning or submersion, including swimming pools and quenching tanks (E910.8)	373	45.1
Accidental drowning or submersion in bathtub (E910.4))	273	33.1
Unspecified accidental drowning or submersion (E910.9)	146	17.6
Accidental drowning or submersion while engaged in other sport or recreational activity without diving equipment (E910.2)	34	4.1
Accidental drowning or submersion while swimming or diving for purposes other than recreation or sport (E910.3)	1	0.1
Accidental drowning or submersion while engaged in other sport or recreational activity with diving equipment (E910.1)	1	0.1

[1]Note that the values in the table exclude deaths from 1999 due to coding changes; therefore, totals may not add up to totals in other tables.
Data Source: National Vital Statistics System, 1992-1998.

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The death rate for drowning is highest among young children younger than 5, lowest among adolescents and adults, and increased among those age 70 and older **(Figure 3.26)**. Young children are at greatest risk for drowning, compared with all other age groups. Lapses in adult supervision while children are bathing or around any body of water, such as swimming pools or standing water in containers, are commonly associated with childhood drownings. Males experience higher rates of home drownings, compared with females, across all age groups.

Figure 3.26. Drownings/Fatal Submersions in the Home. Average Annual Rate (per 100,000 persons), by Age Group and Sex, U.S., 1992-1999.
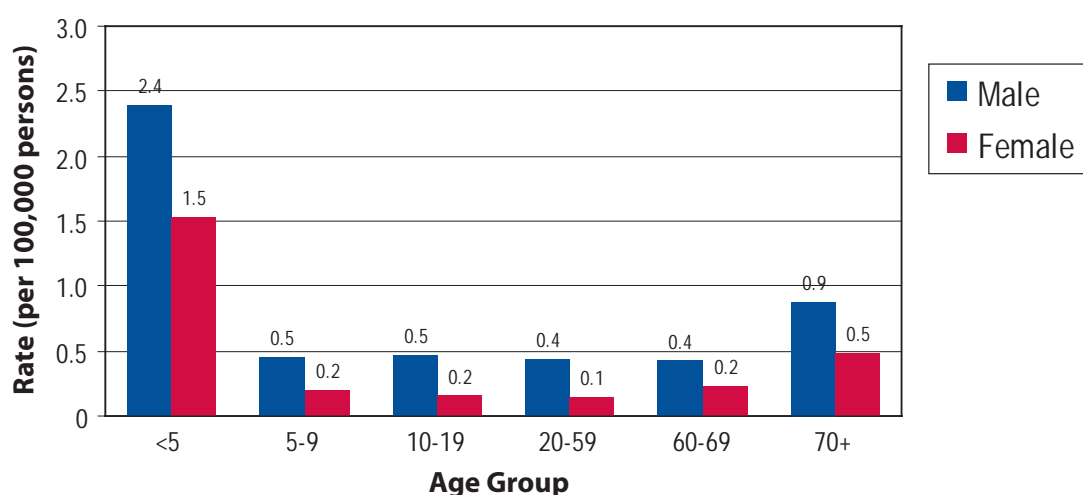
Data Source: National Vital Statistics System, 1992-1999.

Nonfatal Injuries — Data on unintentional near-drownings from the National Health Interview Survey were available for 1997 only. In this year, there were a total of 24,768 near-drowning events, less than 10 percent of which occurred in the home **(Table 3.20, Figure 3.27)**. Near-drowning injuries are defined as survival for at least 24 hours after suffocation from submersion in water. In contrast, drownings (as presented above) are by definition fatal events, defined specifically as deaths resulting from suffocation within 24 hours of submersion in water.

3

Table 3.20. Location of Near-Drownings/Nonfatal Submersions. Annual Number, Percentage and Rate (per 100,000 persons), U.S., 1997.

Location	Number	Percentage	Rate
Home	2,380	9.6	0.9
Location other than home	22,388	90.4	8.3
Unknown	0	0	0

Data Source: National Health Interview Survey, 1997.

Figure 3.27. Location of Near-Drownings/Nonfatal Submersions. Annual Rate (per 100,000 persons), U.S., 1997.
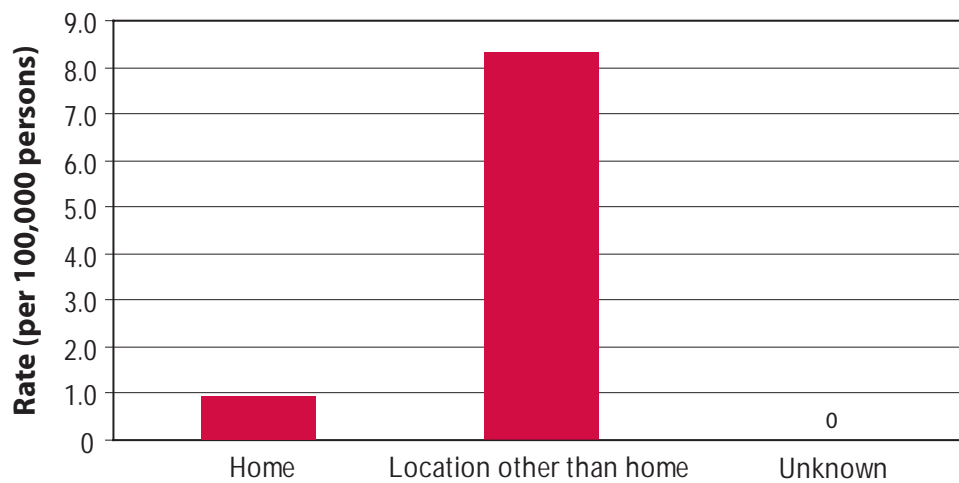
Data Source: National Health Interview Survey, 1997.

Emergency Department Visits — An average of 7,171 near-drowning injuries, resulting in an emergency department visit, occur in the home environment every year in the United States **(Table 3.21)**. The percentages of near-drownings resulting in an emergency department visit are similar for events that occur at home (33.9%) and those that occur in a location other than the home (37.6%) **(Table 3.21)**. Similar to missing data issues for other causes of nonfatal injury resulting in an emergency department visit, the location of near-drownings could not be identified in nearly 30 percent of all events, which again limits the ability to accurately estimate the true number of near-drownings that are treated in emergency departments in the United States **(Figure 3.28)**. Children younger than 5 experience the highest rates of unintentional near-drownings resulting in an emergency department visit **(Figure 3.29)**.

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Table 3.21 Location of Near-Drownings/Nonfatal Submersions Resulting in Emergency Department Visits. Average Annual Number, Percentage and Rate (per 100,000 persons), U.S., 1993-2000.

Location	Number	Percentage	Rate
Home	7,171	33.9	2.7
Location other than home	7,953	37.6	3.0
Unknown	6,013	28.4	2.2

Data Source: National Hospital Ambulatory Medical Care Survey -- Emergency Department, 1993-2000.

Figure 3.28. Location of Near-Drownings/Nonfatal Submersions Resulting in Emergency Department Visits. Average Annual Rate (per 100,000 persons), U.S., 1993-2000.
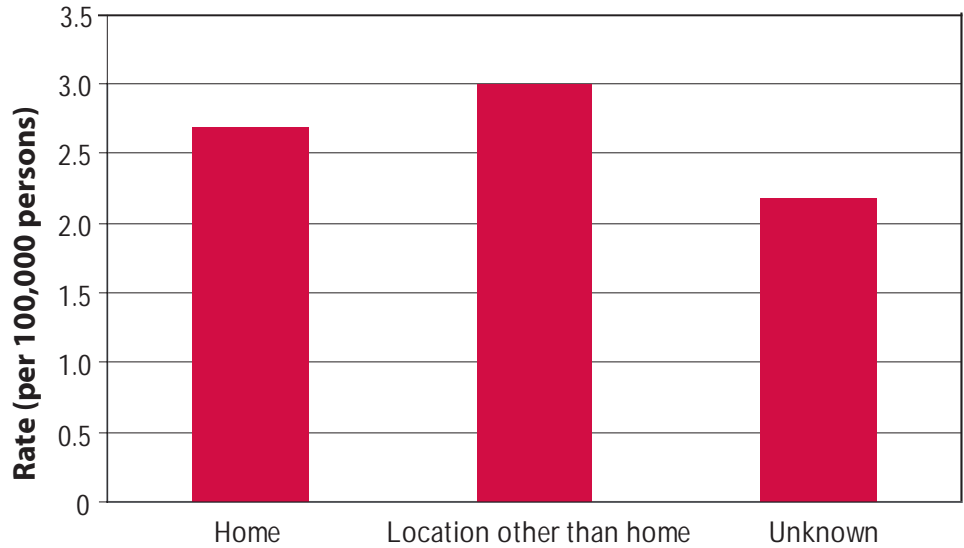
Data Source: National Hospital Ambulatory Medical Care Survey -- Emergency Department, 1993-2000.

Figure 3.29. Near-Drownings/Nonfatal Submersions in the Home Resulting in Emergency Department Visits. Average Annual Rate (per 100,000 persons), by Age Group and Sex, U.S., 1993-2000.
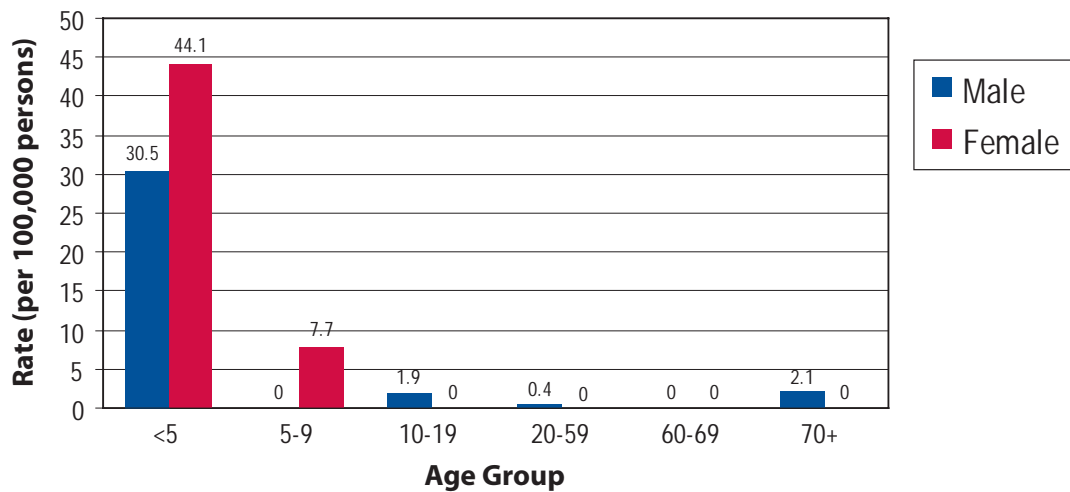
Data Source: National Hospital Ambulatory Medical Care Survey -- Emergency Department, 1993-2000.

Summary — Drowning is the fifth leading cause of home injury death in the United States. While near-drownings are not a leading cause of nonfatal home injuries, an average of more than 10,000 events occur in the home each year that require medical care, emergency department treatment and/or result in days away from work and/or school. Children younger than 5 have the highest rates of drowning and near-drowning injuries that occur in the home. Lapses in adult supervision, in combination with a child's access to water and inability to swim, are thought to be primary contributors to drowning and near-drowning events.

The American Academy of Pediatrics recommends a variety of age group-specific strategies to prevent drownings among children, including, but not limited to: supervision while bathing or around any body of water, removal of standing water from containers, and use of pool-side, U.S. Coast Guard-approved personal flotation devices (life preservers). However, the only evidence-based drowning prevention strategy shown to be effective to date is for those drownings occurring in swimming pools. The proper installation of four-sided fencing around swimming pools with a self-closing gate that is self-latching has been shown to lower the risk of pool drownings.

While children have the highest home drowning rates, older adults are also at increased risk. The circumstances surrounding these drowning events, however, are not clear; additional research is needed. Some may be associated with slips and falls in tubs and showers or into other bodies of water, or with seizure disorders. In addition, living alone reduces the chances of rescue when submersion occurs.

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Chapter 4 -- Leading Causes of Unintentional Home Injury in High-Risk Age Groups

Children and older adults have increased rates of unintentional home injury, compared with all other age groups. This chapter focuses specifically on these high-risk populations.

Children Younger Than 15

Deaths — An average of 2,096 children younger than 15 die each year in the United States as a result of a home injury. Fires and burns, choking and suffocation, and drowning and submersions are leading causes of unintentional home injury death among children in this age group **(Table 4.1)**. Fire and burn deaths are the leading cause for children age 1 to 14 and the second leading cause for children younger than 1. For children younger than 10, falls are among the top five causes of unintentional home injury death. Note that fall and poisoning deaths for children less than a year old are tied as the fourth leading cause of home injury death in this age group, each with a rate of 0.34 per 100,000 persons less than 1 year old **(Table 4.2)**.

Children less than a year old have the highest rate of home injury death, compared to all other childhood age groups, with a rate of 12.19 deaths per 100,000 children less than a year old **(Table 4.2)**. An average of 468 children younger than 1 die each year in the United States as a result of home injury, the majority of which are due to choking and suffocation incidents (62.8%). Children between 1 and 4 have the second highest rate of home injury death per year, in which nearly 75 percent of the injuries are the result of residential fires (43.7%) and drownings (29.3%).

4

Table 4.1. Unintentional Home Injury Death Involving Children. Leading Causes of Death, Ranked by Rate (per 100,000 persons), U.S., 1992-1999.

RANK	Age Group				TOTAL
	<1	**1-4**	**5-9**	**10-14**	**<15**
1	Choking/ Suffocation	Fire/Burn	Fire/Burn	Fire/Burn	Fire/Burn
2	Fire/Burn	Drowning/ Submersion	Drowning/ Submersion	Firearm	Choking/ Suffocation
3	Drowning/ Submersion	Choking/ Suffocation	Choking/ Suffocation	Choking/ Suffocation	Drowning/ Submersion
4	Fall[1] Poisoning[1]	Fall	Firearm	Poisoning	Firearm
5		Struck By/ Against	Fall	Drowning/ Submersion	Poisoning

[1] Tied as fourth leading cause.
Data Source: National Vital Statistics System, 1992-1999.

Table 4.2. Unintentional Home Injury Deaths Involving Children. Average Annual Number and Rate (per 100,000 persons), by Age Group, All Causes, U.S., 1992-1999.

Cause	Age Group <1 Number	Rate	1-4 Number	Rate	5-9 Number	Rate	10-14 Number	Rate	TOTAL <15 Number	Rate
Fall	13	0.34	38	0.25	12	0.06	7	0.04	69	0.09
Poisoning	13	0.34	24	0.15	8	0.04	27	0.14	72	0.12
Fire/Burn	63	1.64	436	2.80	200	1.05	83	0.44	782	1.40
Choking/Suffocation	294	7.66	120	0.78	38	0.20	44	0.23	496	0.86
Drowning/Submersion	61	1.57	293	1.89	42	0.22	23	0.12	417	0.73
Struck By/Against	4	0.10	24	0.16	10	0.05	6	0.03	44	0.08
Cut/Pierce	1	0.03	3	0.02	2	0.01	1	0.01	7	0.01
Overexertion	0	0	0	0	0	0	0	0	0	0
Natural/Environmental	9	0.23	16	0.10	7	0.04	7	0.04	37	0.06
Machinery	0	0	6	0.04	3	0.02	6	0.03	16	0.03
Pedal Cyclist, Other	0	0	0	0	0	0	0	0	0	0
Transport, Other	0	0	0	0	0	0	0	0	0	0
Motor Vehicle	0	0	0	0	0	0	0	0	0	0
Pedestrian, Other	0	0	0	0	0	0	0	0	0	0
Firearm	1	0.01	18	0.12	23	0.12	70	0.37	112	0.20
Miscellaneous	5	0.13	12	0.08	7	0.04	6	0.03	30	0.05
Unspecified	5	0.13	7	0.04	2	0.01	2	0.01	16	0.03
TOTAL	468	12.19	997	6.42	354	1.85	277	1.47	2,097	3.66

Data Source: National Vital Statistics System, 1992-1999.

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Nonfatal Injuries — For every one home injury death among a child younger than 15, there are nearly 1,500 nonfatal home injuries. Children experience an average of more than 3 million unintentional nonfatal injuries in the home each year. Falls are the leading cause of nonfatal home injuries across all childhood age groups **(Table 4.3)**, accounting for an average of nearly 1.3 million injuries each year. Unintentional poisonings are the second leading cause of nonfatal injury for children less than 5 years of age. Nonfatal home injuries as a result of being struck by, or striking against, objects or persons ("struck by/against"), and those caused by sharp objects ("cut/pierce") are also leading causes of nonfatal unintentional home injury among children.

Children between the ages of 1 and 4 have the highest rate of unintentional nonfatal home injury, compared with all other childhood age groups **(Table 4.4)**. Falls account for half (49.5%) of these injuries, with an annual rate of 3,965 per 100,000 children between the ages of 1 and 4. Falls also account for nearly half (47.1%) of the nonfatal injuries experienced by children less than a year old. From 5 years on, this percentage falls to approximately 30 percent. By the time children are between 10 and 14, home injuries involving bicycles or other pedal equipment (occurring in driveways or backyards, for example) become a leading cause, accounting for an average of 66,737 nonfatal injuries each year.

Table 4.3. Nonfatal Unintentional Home Injury Involving Children. Leading Causes of Injury, Ranked by Rate (per 100,000 persons), U.S., 1997-2001.

RANK	Age Group <1	1-4	5-9	10-14	TOTAL <15
1	Fall	Fall	Fall	Fall	Fall
2	Poisoning	Poisoning	Struck By/Against	Struck By/Against	Struck By/Against
3	Struck By/Against	Struck By/Against	Cut/Pierce	Cut/Pierce	Cut/Pierce
4	Miscellaneous	Natural/Environmental	Miscellaneous	Miscellaneous	Poisoning
5	Fire/Burn	Cut/Pierce	Natural/Environmental	Pedal Cyclist	Miscellaneous

Data Source: National Health Interview Survey, 1997-2001.

Table 4.4. Nonfatal Unintentional Home Injuries Involving Children. Average Annual Number and Rate (per 100,000 persons), by Age Group, All Causes, U.S., 1997-2001.

| | Age Group | | | | | | | | TOTAL <15 | |
| | <1 | | 1-4 | | 5-9 | | 10-14 | | | |
Cause	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Fall	54,882	1,395	624,260	3,965	338,615	1,660	269,371	1,345	1,287,129	2,144
Poisoning	21,906	552	186,484	1,189	49,160	243	29,096	143	286,646	474
Fire/Burn	8,114	205	34,725	220	13,232	65	23,754	118	79,825	133
Choking/Suffocation	1,967	50	6,752	43	3,412	17	0	0	12,131	20
Near-Drowning/Submersion	0	0	2,380	15	0	0	0	0	2,380	4
Struck By/Against	8,298	212	157,376	1,001	215,707	1,056	182,474	916	563,854	939
Cut/Pierce	5,729	145	55,078	350	152,394	748	108,415	543	321,617	535
Overexertion	3,511	90	33,102	210	9,774	48	32,826	165	79,213	132
Natural/Environmental	2,480	63	65,967	419	65,502	307	54,530	271	185,478	309
Machinery	0	0	0	0	0	0	0	0	0	0
Pedal Cyclist, Other	0	0	13,222	84	62,310	306	66,737	334	142,269	237
Transport, Other	0	0	4,468	29	7,470	37	21,516	106	33,454	56
Motor Vehicle	0	0	12,105	77	3,674	18	6,679	34	22,458	37
Pedestrian, Other	0	0	2,637	17	0	0	6,323	25	8,960	13
Firearm	*	*	*	*	*	*	*	*	*	*
Miscellaneous	8,331	210	48,077	306	102,063	501	76,122	384	234,593	392
Unspecified	1,314	33	14,282	90	22,705	111	17,977	91	56,277	94
TOTAL	116,532	3,459	1,260,915	9,995	1,043,018	5,933	895,820	5,119	3,316,285	5,229

* - data missing.
Data Source: National Health Interview Survey, 1997-2001.

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Emergency Department Visits — An average of 3.4 million home injuries are treated in hospital emergency departments each year among children less than 15 years of age. More than half of the visits are by children between the ages of 1 and 9, who are treated for fall-related injuries. Falls are the leading cause of home injury resulting in an emergency department visit for all children younger than 15, and being struck by or against an object or person is the second leading cause **(Table 4.5)**.

Fall injuries that occur in the home account for 35 percent of all emergency department visits for children, for an average of 1.2 million visits per year **(Table 4.6)**. Being struck by or against an object or person accounts for an additional 21.3 percent of the visits, for an average of more than 725,000 visits per year. Children between the ages of 1 and 4 have the highest emergency department rates for home injuries, followed by children less than a year old.

Table 4.5. Nonfatal Unintentional Home Injury Resulting in Emergency Department Visits and Involving Children. Leading Causes of Injury, Ranked by Rate (per 100,000 persons), U.S., 1993-2000.

RANK	Age Group				TOTAL <15
	<1	1-4	5-9	10-14	
1	Fall	Fall	Fall	Fall	Fall
2	Struck By/ Against	Struck By/ Against	Struck By/ Against	Struck By/ Against	Struck By/ Against
3	Miscellaneous	Miscellaneous	Cut/Pierce	Cut/Pierce	Cut/Pierce
4	Fire/Burn	Cut/Pierce	Miscellaneous	Miscellaneous	Miscellaneous
5	Unspecified	Natural/ Environmental	Natural/ Environmental	Natural/ Environmental	Natural/ Environmental

Data Source: National Hospital Ambulatory Medical Care Survey -- Emergency Department, 1993-2000.

Table 4.6. Nonfatal Unintentional Home Injuries Resulting in Emergency Department Visits and Involving Children. Average Annual Number and Rate (per 100,000 persons), by Age Group, All Causes, U.S., 1993-2000.

Cause	Age Group								TOTAL <15	
	<1		1-4		5-9		10-14			
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Fall	107,602	2,712.6	567,928	3,551.1	311,021	1,561.9	205,434	1,052.6	1,191,984	2,004.9
Poisoning	9,677	243.5	80,678	508.1	8,116	40.5	10,775	54.5	109,246	183.2
Fire/Burn	15,326	386.0	55,148	344.6	15,196	75.9	11,832	61.0	97,501	164.1
Choking/Suffocation	2,157	54.6	18,117	112.8	3,415	17.2	443	2.3	24,131	40.7
Near-Drowning/Submersion	1,442	36.3	4,324	26.9	768	3.8	0	0	6,534	89.3
Struck By/Against	35,847	907.9	345,960	2,175.5	206,053	1,029.6	139,901	714.9	727,761	1,221.7
Cut/Pierce	11,853	299.0	104,274	654.9	130,085	654.4	123,495	632.0	369,705	621.8
Overexertion	2,752	69.1	32,369	203.5	11,787	58.4	25,976	133.0	72,883	122.4
Natural/Environmental	4,419	111.1	87,272	548.4	74,308	373.0	45,982	234.5	211,981	356.0
Machinery	0	0	1,936	12.2	4,125	20.4	1,330	6.7	7,392	12.4
Pedal Cyclist, Other	0	0	15,008	93.1	47,061	237.8	33,229	169.4	95,298	160.5
Transport, Other	0	0	6,905	43.8	19,235	95.2	11,045	55.9	37,185	62.2
Motor Vehicle	1,737	43.6	3,858	24.1	7,082	35.7	5,327	27.3	18,005	30.3
Pedestrian, Other	0	0	1,963	12.5	1,633	8.0	1,695	8.7	5,291	8.8
Firearm	0	0	0	0	2,610	13.2	2,541	13.2	5,151	8.7
Miscellaneous	20,083	505.9	142,783	895.1	81,521	409.9	52,671	269.2	297,058	459.0
Unspecified	14,084	354.0	45,262	283.9	28,533	144.0	44,967	230.3	132,846	223.0
TOTAL	226,977	5723.7	1,513,784	9,490.5	952,548	4,778.9	716,642	3,665.5	3,409,952	5,731.3

Data Source: National Hospital Ambulatory Medical Care Survey - Emergency Department, 1993-2000.

Adults 65 and Older

Deaths — Each year in the United States, an average of more than 7,000 adults 65 and older die as a result of a home injury. Falls are the leading cause of home injury death **(Table 4.7)**, accounting for 52.5 percent of all home injury deaths for adults between the ages of 65 and 74, 68.2 percent of home injury deaths for adults between 75 and 84, and 78.4 percent of home injury deaths for those 85 and older **(Table 4.8)**. Residential fire injuries are the second leading cause of home injury death for adults 65 and older **(Table 4.7)**, and these rates increase with increasing age **(Table 4.8)**.

Rates of home injury death increase nearly threefold for adults between the ages of 65 and 74 and those between 75 and 84, and nearly eight-fold for adults between 65 and 74 and those 85 and older **(Table 4.8)**.

Table 4.7. Unintentional Home Injury Deaths Involving Older Adults. Leading Causes of Death, Ranked by Rate (per 100,000 persons), U.S., 1992-1999.

RANK	Age Group			TOTAL 65+
	65-74	75-84	85+	
1	Fall	Fall	Fall	Fall
2	Fire/Burn	Fire/Burn	Fire/Burn	Fire/Burn
3	Poisoning	Natural/Environmental	Natural/Environmental	Poisoning
4	Choking/Suffocation	Choking/Suffocation	Unspecified	Natural/Environmental
5	Natural/Environmental	Poisoning	Choking/Suffocation	Choking/Suffocation

Data Source: National Vital Statistics System, 1992-1999.

Table 4.8. Unintentional Home Injury Deaths Involving Older Adults. Average Annual Number and Rate (per 100,000 persons), by Age Group, All Causes, U.S., 1992-1999.

Cause	Age Group						TOTAL 65+	
	65-74		75-84		85+			
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Fall	935	5.05	1,885	16.56	1,932	51.44	4,753	14.11
Poisoning	107	0.79	73	0.65	30	0.80	210	0.62
Fire/Burn	404	1.92	455	4.02	269	7.25	1,128	3.36
Choking/Suffocation	77	0.42	75	0.66	50	1.35	203	0.60
Drowning/Submersion	52	0.28	62	0.55	35	0.94	149	0.44
Struck By/Against	37	0.20	25	0.22	12	0.31	73	0.22
Cut/Pierce	6	0.09	7	0.06	3	0.07	15	0.04
Overexertion	1	0.01	0	0	1	0.01	1	<0.01
Natural/Environmental	70	0.39	82	0.72	57	1.51	209	0.62
Machinery	29	0.13	22	0.20	6	0.16	58	0.17
Pedal Cyclist, Other	0	0	0	0	0	0	0	0
Transport, Other	0	0	0	0	0	0	0	0
Motor Vehicle	0	0	0	0	0	0	0	0
Pedestrian, Other	0	0	0	0	0	0	0	0
Firearm	19	0.10	11	0.10	5	0.13	35	0.10
Miscellaneous	21	0.11	19	0.16	8	0.22	48	0.14
Unspecified	26	0.14	51	0.45	55	1.49	132	0.39
TOTAL	**1,782**	**8.39**	**2,765**	**24.33**	**2,463**	**65.68**	**7,010**	**20.83**

Data Source: National Vital Statistics System, 1992-1999.

Nonfatal Injuries — Older adults in the United States report that they experience an average of 2.3 million unintentional nonfatal home injuries each year. Most of these nonfatal injuries are due to falls. Falls are the leading cause of nonfatal home injury across all older adult age groups **(Table 4.9)**, accounting for more than two-thirds of all nonfatal home injuries. Similar to fall deaths, rates of nonfatal falls increase as age increases, although the magnitude of the increase is much smaller than it is for deaths **(Table 4.10)**. This suggests that with increasing age, survival after a fall diminishes.

Performing movements too strenuous for the body ("overexertion") and being struck by or against a person or object are the second and third leading causes of nonfatal home injury across all older adult age groups, respectively **(Table 4.9)**. Rates of overexertion are highest for adults between 75 and 84 years of age, compared with other age groups **(Table 4.10)**. "Struck by/against" rates are similar across older adult age groups.

Table 4.9. Nonfatal Unintentional Home Injury Involving Older Adults. Leading Causes of Injury, Ranked by Rate (per 100,000 persons), U.S., 1997-2001.

RANK	Age Group 65-74	Age Group 75-84	Age Group 85+	TOTAL 65+
1	Fall	Fall	Fall	Fall
2	Overexertion	Overexertion	Overexertion	Overexertion
3	Struck By/Against	Struck By/Against	Struck By/Against	Struck By/Against
4	Cut/Pierce	Natural/Environmental	Natural/Environmental	Cut/Pierce
5	Poisoning	Poisoning	Miscellaneous	Poisoning

Data Source: National Health Interview Survey, 1997-2001.

Table 4.10. Nonfatal Unintentional Home Injuries Involving Older Adults. Average Annual Number and Rate (per 100,000 persons), by Age Group, All Causes, U.S., 1997-2001.

Cause	65-74 Number	65-74 Rate	75-84 Number	75-84 Rate	85+ Number	85+ Rate	TOTAL 65+ Number	TOTAL 65+ Rate
Fall	584,001	3,256	648,247	5,711	305,018	9,988	1,537,266	4,748
Poisoning	69,904	392	25,668	216	0	0	95,572	292
Fire/Burn	7,474	42	4,695	41	2,139	67	14,309	44
Choking/Suffocation	0	0	0	0	2,108	69	2,108	7
Near-Drowning/Submersion	0	0	0	0	0	0	0	0
Struck By/Against	76,547	427	49,143	432	13,370	434	139,060	429
Cut/Pierce	76,279	425	20,970	182	2,641	87	99,890	308
Overexertion	101,979	568	78,786	688	15,888	511	196,653	607
Natural/Environmental	41,853	234	27,373	236	7,643	245	76,869	236
Machinery	13,340	74	8,286	73	0	0	21,626	67
Pedal Cyclist, Other	0	0	0	0	0	0	0	0
Transport, Other	5,134	28	2,427	21	5,222	163	12,782	39
Motor Vehicle	1,633	9	3,461	31	0	0	5,094	16
Pedestrian, Other	1,860	10	0	0	0	0	1,860	6
Firearm	*	*	*	*	*	*	*	*
Miscellaneous	28,933	162	12,496	109	6,033	205	47,461	147
Unspecified	48,833	273	21,594	194	2,978	98	73,406	227
TOTAL	1,057,770	5,666	903,146	7,805	363,040	11,854	2,323,956	6,995

* - Data missing.
Data Source: National Health Interview Survey, 1997-2001.

Emergency Department Visits — An average of nearly 1.7 million home injuries experienced by older adults each year result in an emergency department visit, and similar to deaths and nonfatal injuries, the majority of these visits are due to falls. In fact, falls are the leading cause of emergency department visits for home injury across all older adult age groups **(Table 4.11)**. The rates of emergency department-treated fall injuries that occur in the home are highest for adults 85 and older, and are more than six times greater than the fall rate for adults between the ages of 65 and 74, and nearly three times greater than the rate for adults between 75 and 84 **(Table 4.12)**. Falls account for 53.5 percent of all emergency department visits for home injuries among the 65–74 age group, 75.1 percent among the 75–84 age group, and 83.7 percent among those 85 and older.

For adults between the ages of 65 and 84, being cut or pierced by an object is the second leading cause of home injury resulting in an emergency department visit; for adults 85 and older, it is the fourth leading cause. "Unspecified" causes rank third for adults 85 and older, indicating the magnitude of the missing data problem in terms of documenting the cause of home injury in medical records **(Table 4.11)**. For adults 65 and older, the cause of injury is not documented in an average of 44,030 home injury cases every year.

Table 4.11. Nonfatal Unintentional Home Injury Resulting in Emergency Department Visits and Involving Older Adults. Leading Causes of Injury, Ranked by Rate (per 100,000 persons), U.S., 1993-2000.

RANK	Age Group			TOTAL
	65-74	75-84	85+	65+
1	Fall	Fall	Fall	Fall
2	Cut/Pierce	Cut/Pierce	Struck By/ Against	Cut/Pierce
3	Struck By/ Against	Struck By/ Against	Unspecified	Struck By/ Against
4	Overexertion	Overexertion	Cut/Pierce	Overexertion
5	Natural/ Environmental	Miscellaneous	Natural/ Environmental	Natural/ Environmental

Data Source: National Hospital Ambulatory Medical Care Survey -- Emergency Department, 1993-2000.

Table 4.12. Unintentional Home Injury Resulting in Emergency Department Visits and Involving Older Adults. Average Annual Number and Rate (per 100,000 persons), by Age Group, All Causes, U.S., 1993-2000.

Cause	65-74 Number	65-74 Rate	75-84 Number	75-84 Rate	85+ Number	85+ Rate	TOTAL 65+ Number	TOTAL 65+ Rate
Fall	333,078	1,846.5	471,886	4,324.5	352,548	11,533.2	1,157,512	3,617.5
Poisoning	8,598	48.1	1,769	15.7	1,202	37.7	11,569	35.7
Fire/Burn	9,292	51.7	7,625	70.5	3,793	118.0	20,709	64.4
Choking/Suffocation	3,454	19.0	978	9.3	346	12.6	4,778	15.0
Near-Drowning/Submersion	0	0	0	0	0	0	0	0
Struck By/Against	60,015	333.1	36,475	333.5	21,019	657.5	117,509	365.8
Cut/Pierce	68,502	379.8	40,435	367.2	9,403	312.1	118,340	369.6
Overexertion	36,678	203.2	15,554	143.9	7,091	237.4	59,322	186.0
Natural/Environmental	36,289	201.4	12,579	114.7	7,096	246.0	55,964	175.5
Machinery	15,517	86.3	4,984	45.3	0	0	20,502	63.8
Pedal Cyclist, Other	593	3.2	127	1.2	757	27.6	1,478	4.7
Transport, Other	4,496	24.9	3,042	27.0	831	26.2	8,369	26.1
Motor Vehicle	2,350	13.1	4,619	41.8	1,335	44.9	8,303	25.8
Pedestrian, Other	0	0	0	0	0	0	0	0
Firearm	0	0	0	0	0	0	0	0
Miscellaneous	25,380	141.2	15,089	135.2	2,964	90.6	43,433	134.0
Unspecified	18,163	100.7	13,083	120.4	12,784	408.2	44,030	137.2
TOTAL	622,404	3,452.0	628,245	5,750.2	421,169	13,752.0	1,671,819	5,222.1

Data Source: National Hospital Ambulatory Medical Care Survey -- Emergency Department, 1993-2000.

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Chapter 5 - Unintentional Home Injury Deaths by State

The table **(Table 5.2)** on the following pages shows the ranking of the five leading causes of death due to unintentional home injury for each of the 50 states and the District of Columbia. The ranking is based on where the state falls in descending order of unintentional home injury death rates, where '1' represents the highest rate. The number of deaths for each state was obtained from the National Vital Statistics System, which collects data from all death certificates filed in vital statistics offices around the United States. The death rates were adjusted for any age differences between states.

Between 1992 and 1999, New Mexico had the highest annual average rate of unintentional home injury deaths (13.03 per 100,000 persons), while Massachusetts had the lowest annual average rate (3.33 per 100,000 persons) **(Figure 5.1 and Figure 5.2)**. Following New Mexico, Mississippi and Arizona had the second and third highest rates, exceeding the national average by 38 percent and 33 percent, respectively **(Table 5.1)**. Following Massachusetts, Utah and Maryland had the lowest rates, with annual average rates of 42 percent and 36 percent lower than the national average, respectively.

In general, death rates are similar for the leading causes of death among states **(Table 5.2)**. However, regional variations can be observed. For example, Southeastern states have high rates of death from residential fires, compared with other leading causes or compared to other states. This may be due to a variety of factors, including differences in the type of home heating, type of construction of the home, and the prevalence of manufactured housing. Rates of drowning deaths are highest in Florida, Arizona, Nevada and California where climates are warmer and swimming pools may be more common.

Overall United States

Table 5.1. Unintentional Home Injury Deaths. Average Annual Number and Rate (per 100,000 persons), U.S., 1992-1999.

Cause	Deaths	Rate*
Falls	5,961	2.25
Poisonings	4,833	1.83
Fires/Burns	3,402	1.29
Suffocations	1,092	0.41
Drownings	823	0.31
Other	1,937	0.73
All	18,048	6.83

* - per 100,000 persons

Data Source: National Vital Statistics System, 1992-1999.

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The reason states differ in their rates of death cannot be explained from the dataset used to obtain the number of deaths. However, factors that may contribute to the differences include:

- Access to health care, especially associated with rurality;
- Socio-demographics, particularly associated with poverty;
- Climate (e.g., related to home heating and its association with fires);
- Cultural differences in home safety practices;
- Reporting of location and causes of death on death certificates;
- Possible differences in alcohol use;
- Building materials in the construction of homes; and
- Tendency to have certain types of homes or features of homes by region (e.g., modular housing, multiple floors, windows without screens, swimming pools).

Unintentional Home Injury Deaths

Figure 5.1. Unintentional Home Injury Deaths. Average Annual Rate (per 100,000 persons), by State, U.S., 1992-1999.

State	Rate
WA	8.14
MT	7.88
ND	5.81
MN	5.49
NH	4.64
VT	5.54
ME	6.02
OR	7.14
ID	7.13
SD	7.88
WI	7.02
MI	5.77
NY	5.49
MA	3.33
WY	7.01
IA	6.96
PA	8.99
RI	4.83
CT	7.44
NV	6.79
UT	3.99
NE	6.30
IL	7.59
IN	5.53
OH	5.84
NJ	5.81
CA	6.88
CO	5.81
KS	6.64
MO	8.01
WV	8.61
VA	5.99
DE	7.93
KY	7.23
MD	4.38
AZ	10.12
NM	13.03
OK	7.49
AR	7.72
TN	7.35
NC	5.83
DC	6.35
SC	7.86
MS	11.00
AL	6.07
GA	8.10
TX	6.85
LA	6.36
FL	7.98
AK	8.40
HI	4.80

Rate
- 0 - 4.99 per 100,000
- 5 - 6.99 per 100,000
- 7 - 8.99 per 100,000
- 9 - 13.99 per 100,000
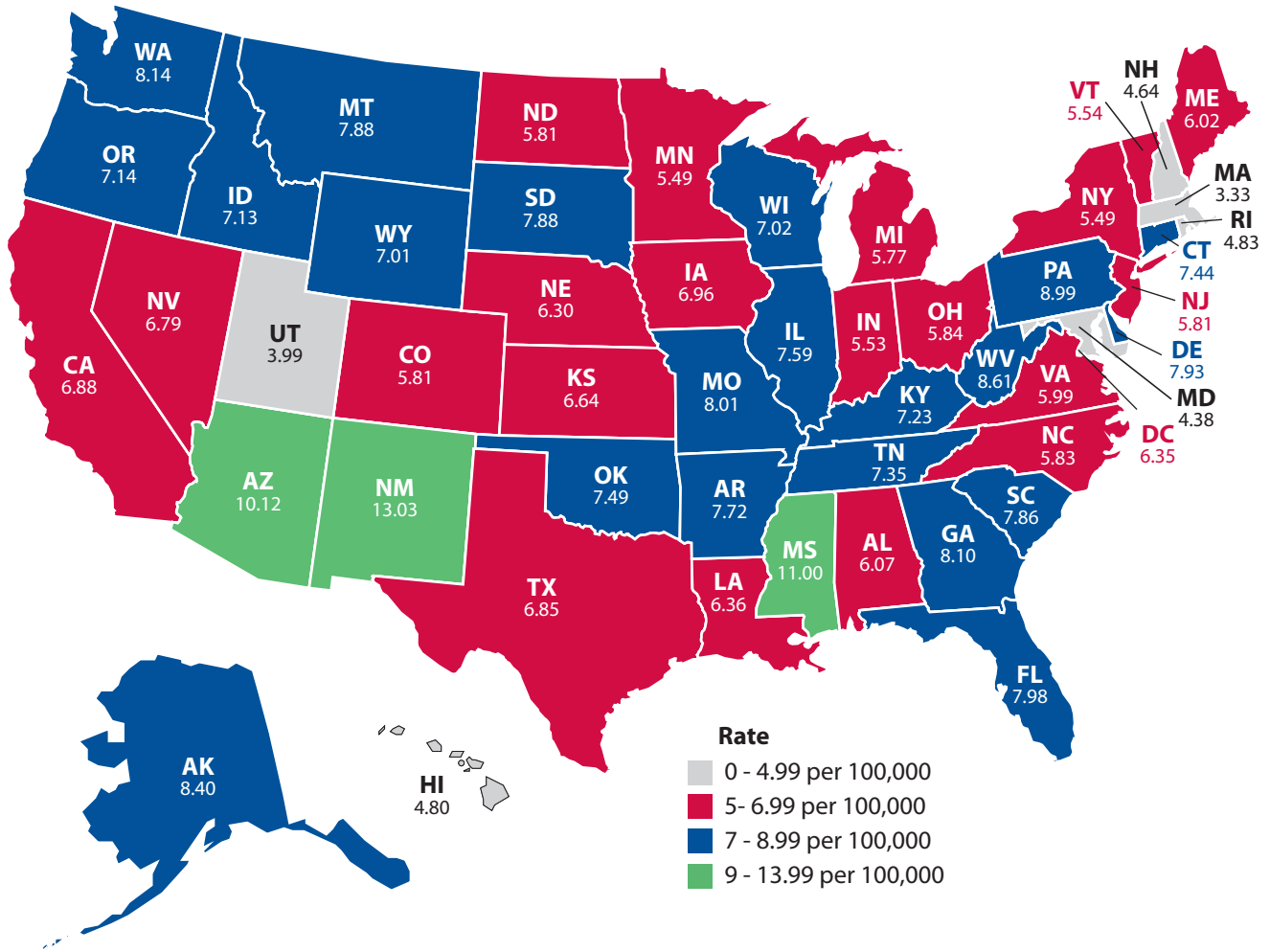
Data Source: National Vital Statistics System, 1992-1999.

Figure 5.2. State-Specific Unintentional Home Injury Deaths, Average Annual Rates (per 100,000 persons), U.S., 1992-1999.
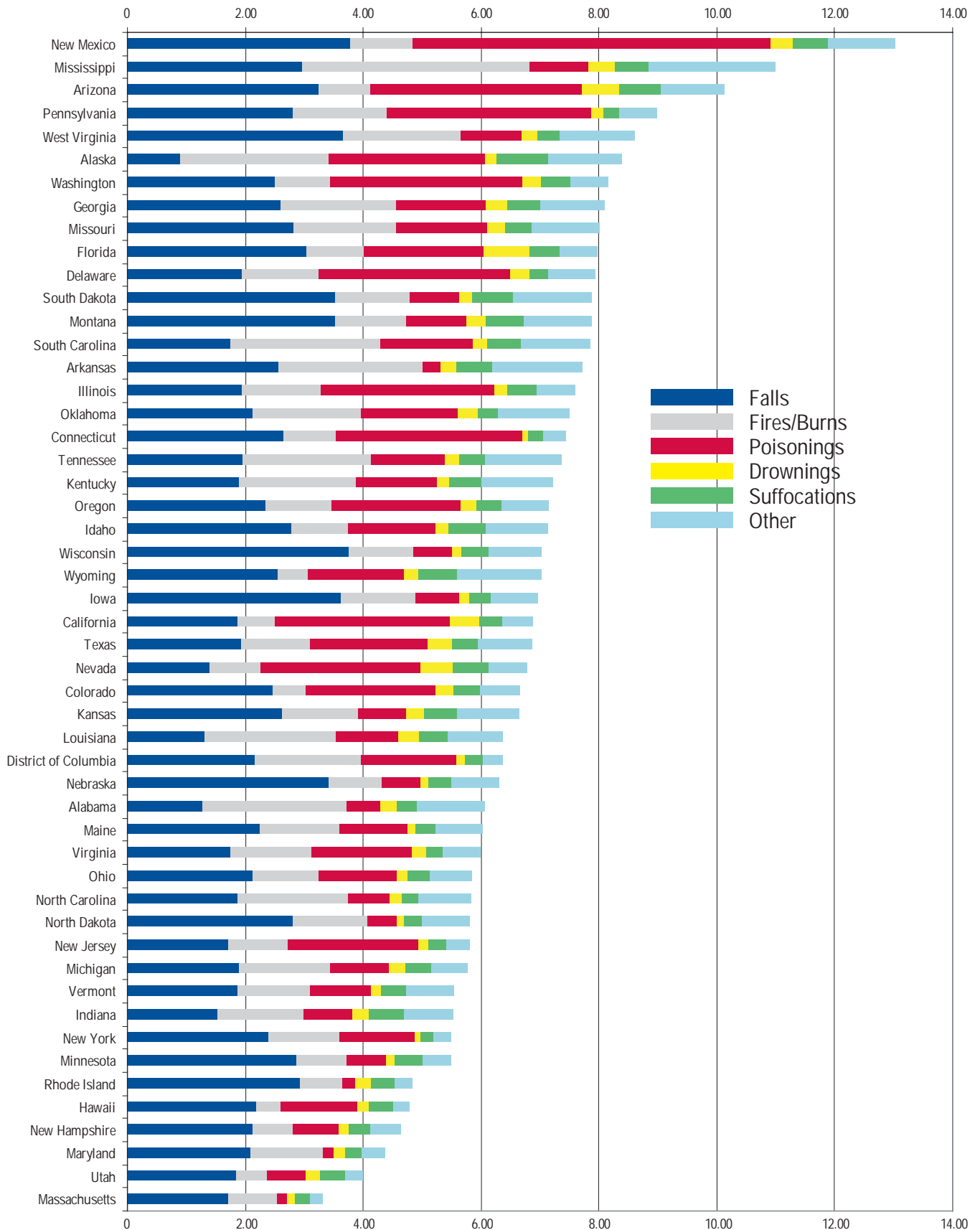
Data Source: National Vital Statistics System, 1992-1999.

Table 5.2. Unintentional Home Injury Deaths. Average Annual Number, Rate (per 100,000 persons) and Rank, by State and Leading Causes, U.S., 1992-1999.

Alabama

Cause	Deaths	Rate*	Rank
Falls	54	1.27	50
Poisonings	24	0.56	46
Fires/Burns	105	2.45	4
Suffocations	14	0.34	38
Drownings	12	0.28	18
All Other	50	1.16	11
All	259	6.07	34

Alaska

Cause	Deaths	Rate*	Rank
Falls	5	0.89	51
Poisonings	16	2.65	10
Fires/Burns	15	2.53	2
Suffocations	5	0.88	1
Drownings	1	0.19	37
All Other	9	1.26	7
All	51	8.40	6

Arizona

Cause	Deaths	Rate*	Rank
Falls	142	3.24	8
Poisonings	159	3.59	2
Fires/Burns	38	0.88	40
Suffocations	31	0.70	2
Drownings	28	0.64	2
All Other	45	1.06	16
All	443	10.12	3

Arkansas

Cause	Deaths	Rate*	Rank
Falls	64	2.56	20
Poisonings	8	0.30	48
Fires/Burns	61	2.44	5
Suffocations	14	0.58	9
Drownings	7	0.29	16
All Other	38	1.54	2
All	192	7.72	15

California

Cause	Deaths	Rate*	Rank
Falls	594	1.86	40
Poisonings	939	2.95	7
Fires/Burns	207	0.65	47
Suffocations	122	0.38	32
Drownings	162	0.51	4
All Other	167	0.52	40
All	2191	6.88	26

Colorado

Cause	Deaths	Rate*	Rank
Falls	93	2.46	23
Poisonings	84	2.21	11
Fires/Burns	21	0.56	48
Suffocations	17	0.46	21
Drownings	11	0.30	14
All Other	26	0.67	32
All	252	6.66	29

Connecticut

Cause	Deaths	Rate*	Rank
Falls	87	2.64	17
Poisonings	103	3.15	6
Fires/Burns	30	0.90	39
Suffocations	8	0.25	49
Drownings	4	0.11	51
All Other	12	0.38	45
All	244	7.44	18

Delaware

Cause	Deaths	Rate*	Rank
Falls	14	1.95	33
Poisonings	24	3.26	4
Fires/Burns	9	1.30	21
Suffocations	2	0.31	41
Drownings	2	0.31	13
All Other	6	0.80	27
All	57	7.93	11

District of Columbia

Cause	Deaths	Rate*	Rank
Falls	12	2.17	28
Poisonings	9	1.64	18
Fires/Burns	10	1.79	13
Suffocations	2	0.30	42
Drownings	1	0.14	45
All Other	2	0.33	46
All	36	6.35	32

Florida

Cause	Deaths	Rate*	Rank
Falls	436	3.05	9
Poisonings	292	2.02	14
Fires/Burns	139	0.98	36
Suffocations	75	0.52	16
Drownings	111	0.78	1
All Other	92	0.64	35
All	1145	7.98	10

Georgia

Cause	Deaths	Rate*	Rank
Falls	191	2.61	19
Poisonings	112	1.53	22
Fires/Burns	140	1.94	10
Suffocations	41	0.57	12
Drownings	26	0.36	8
All Other	78	1.09	15
All	588	8.10	8

Hawaii

Cause	Deaths	Rate*	Rank
Falls	26	2.18	27
Poisonings	15	1.29	26
Fires/Burns	5	0.42	51
Suffocations	5	0.42	29
Drownings	2	0.20	34
All Other	4	0.29	49
All	57	4.80	47

* per 100,000 persons

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Idaho

Cause	Deaths	Rate*	Rank
Falls	33	2.78	16
Poisonings	18	1.49	23
Fires/Burns	11	0.96	37
Suffocations	7	0.63	5
Drownings	3	0.21	30
All Other	12	1.05	17
All	84	7.13	22

Illinois

Cause	Deaths	Rate*	Rank
Falls	232	1.95	33
Poisonings	352	2.95	7
Fires/Burns	159	1.33	20
Suffocations	58	0.49	17
Drownings	25	0.21	30
All Other	78	0.66	34
All	904	7.59	16

Indiana

Cause	Deaths	Rate*	Rank
Falls	89	1.52	47
Poisonings	49	0.84	36
Fires/Burns	85	1.46	17
Suffocations	35	0.60	7
Drownings	16	0.27	21
All Other	48	0.84	23
All	322	5.53	43

Iowa

Cause	Deaths	Rate*	Rank
Falls	103	3.62	4
Poisonings	21	0.74	40
Fires/Burns	36	1.27	24
Suffocations	10	0.36	36
Drownings	5	0.17	41
All Other	23	0.80	27
All	198	6.96	25

Kansas

Cause	Deaths	Rate*	Rank
Falls	68	2.63	18
Poisonings	21	0.82	38
Fires/Burns	33	1.28	22
Suffocations	15	0.56	14
Drownings	8	0.30	14
All Other	27	1.05	17
All	172	6.64	30

Kentucky

Cause	Deaths	Rate*	Rank
Falls	73	1.90	37
Poisonings	53	1.36	24
Fires/Burns	77	1.98	9
Suffocations	21	0.54	15
Drownings	9	0.22	29
All Other	46	1.22	8
All	279	7.23	20

Louisiana

Cause	Deaths	Rate*	Rank
Falls	57	1.32	49
Poisonings	46	1.06	30
Fires/Burns	96	2.21	6
Suffocations	21	0.49	17
Drownings	15	0.35	9
All Other	40	0.92	19
All	275	6.36	31

Maine

Cause	Deaths	Rate*	Rank
Falls	28	2.25	26
Poisonings	14	1.16	29
Fires/Burns	17	1.35	19
Suffocations	4	0.33	40
Drownings	2	0.14	45
All Other	10	0.80	27
All	75	6.02	35

Maryland

Cause	Deaths	Rate*	Rank
Falls	105	2.08	32
Poisonings	9	0.18	50
Fires/Burns	62	1.23	27
Suffocations	14	0.28	48
Drownings	11	0.21	30
All Other	20	0.39	43
All	221	4.38	49

Massachusetts

Cause	Deaths	Rate*	Rank
Falls	104	1.70	46
Poisonings	10	0.16	51
Fires/Burns	52	0.85	44
Suffocations	15	0.25	49
Drownings	9	0.14	45
All Other	13	0.23	51
All	203	3.33	51

Michigan

Cause	Deaths	Rate*	Rank
Falls	182	1.88	38
Poisonings	96	0.99	34
Fires/Burns	151	1.56	16
Suffocations	43	0.45	23
Drownings	27	0.27	30
All Other	60	0.62	39
All	559	5.77	41

Minnesota

Cause	Deaths	Rate*	Rank
Falls	132	2.86	12
Poisonings	31	0.67	42
Fires/Burns	40	0.86	43
Suffocations	22	0.47	20
Drownings	7	0.14	45
All Other	22	0.49	42
All	254	5.49	44

* per 100,000 persons

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Mississippi

Cause	Deaths	Rate*	Rank
Falls	80	2.96	10
Poisonings	27	0.99	34
Fires/Burns	104	3.87	1
Suffocations	16	0.58	9
Drownings	13	0.46	5
All Other	57	2.14	1
All	297	11.00	2

Missouri

Cause	Deaths	Rate*	Rank
Falls	152	2.83	13
Poisonings	84	1.56	21
Fires/Burns	92	1.72	14
Suffocations	25	0.46	21
Drownings	15	0.28	18
All Other	61	1.16	11
All	429	8.01	9

Montana

Cause	Deaths	Rate*	Rank
Falls	31	3.52	5
Poisonings	9	1.01	33
Fires/Burns	11	1.22	28
Suffocations	5	0.62	6
Drownings	3	0.33	10
All Other	9	1.16	11
All	68	7.88	12

Nebraska

Cause	Deaths	Rate*	Rank
Falls	56	3.43	7
Poisonings	11	0.66	43
Fires/Burns	14	0.88	40
Suffocations	6	0.38	32
Drownings	2	0.15	44
All Other	14	0.81	25
All	103	6.30	33

Nevada

Cause	Deaths	Rate*	Rank
Falls	22	1.40	48
Poisonings	44	2.71	9
Fires/Burns	14	0.87	42
Suffocations	10	0.59	8
Drownings	8	0.55	3
All Other	10	0.67	32
All	108	6.79	28

New Hampshire

Cause	Deaths	Rate*	Rank
Falls	25	2.13	29
Poisonings	9	0.76	39
Fires/Burns	8	0.68	46
Suffocations	4	0.35	37
Drownings	2	0.20	34
All Other	6	0.52	40
All	54	4.64	48

New Jersey

Cause	Deaths	Rate*	Rank
Falls	138	1.72	45
Poisonings	177	2.21	11
Fires/Burns	81	1.01	35
Suffocations	24	0.30	42
Drownings	14	0.17	41
All Other	31	0.39	43
All	465	5.81	39

New Mexico

Cause	Deaths	Rate*	Rank
Falls	64	3.77	1
Poisonings	103	6.09	1
Fires/Burns	18	1.07	34
Suffocations	10	0.58	9
Drownings	6	0.38	7
All Other	19	1.14	14
All	220	13.03	1

New York

Cause	Deaths	Rate*	Rank
Falls	435	2.40	24
Poisonings	229	1.26	27
Fires/Burns	219	1.20	29
Suffocations	39	0.21	51
Drownings	21	0.12	49
All Other	54	0.30	47
All	997	5.49	44

North Carolina

Cause	Deaths	Rate*	Rank
Falls	137	1.88	38
Poisonings	53	0.73	41
Fires/Burns	134	1.86	11
Suffocations	21	0.29	44
Drownings	13	0.19	37
All Other	65	0.89	22
All	423	5.83	38

North Dakota

Cause	Deaths	Rate*	Rank
Falls	18	2.80	15
Poisonings	3	0.51	47
Fires/Burns	8	1.27	24
Suffocations	2	0.29	44
Drownings	1	0.12	49
All Other	5	0.82	24
All	37	5.81	39

Ohio

Cause	Deaths	Rate*	Rank
Falls	238	2.13	29
Poisonings	148	1.33	25
Fires/Burns	124	1.11	31
Suffocations	42	0.38	32
Drownings	20	0.18	39
All Other	80	0.72	31
All	652	5.84	37

* per 100,000 persons

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Oklahoma

Cause	Deaths	Rate*	Rank
Falls	70	2.13	29
Poisonings	55	1.66	17
Fires/Burns	60	1.82	12
Suffocations	11	0.34	38
Drownings	11	0.33	10
All Other	39	1.21	9
All	246	7.49	17

South Carolina

Cause	Deaths	Rate*	Rank
Falls	66	1.76	43
Poisonings	59	1.57	20
Fires/Burns	94	2.53	2
Suffocations	22	0.57	12
Drownings	9	0.25	24
All Other	43	1.18	10
All	293	7.86	14

Utah

Cause	Deaths	Rate*	Rank
Falls	37	1.85	42
Poisonings	13	0.66	43
Fires/Burns	10	0.52	49
Suffocations	9	0.44	26
Drownings	5	0.24	25
All Other	5	0.28	50
All	79	3.99	50

Oregon

Cause	Deaths	Rate*	Rank
Falls	75	2.35	25
Poisonings	70	2.19	13
Fires/Burns	35	1.10	32
Suffocations	13	0.41	30
Drownings	9	0.29	16
All Other	24	0.80	27
All	226	7.14	21

South Dakota

Cause	Deaths	Rate*	Rank
Falls	26	3.51	6
Poisonings	6	0.84	36
Fires/Burns	9	1.28	22
Suffocations	5	0.69	3
Drownings	2	0.21	30
All Other	9	1.34	4
All	57	7.88	12

Vermont

Cause	Deaths	Rate*	Rank
Falls	11	1.86	40
Poisonings	6	1.02	32
Fires/Burns	7	1.24	26
Suffocations	3	0.43	28
Drownings	1	0.17	41
All Other	4	0.81	25
All	32	5.54	42

Pennsylvania

Cause	Deaths	Rate*	Rank
Falls	337	2.81	14
Poisonings	418	3.48	3
Fires/Burns	190	1.58	15
Suffocations	35	0.29	44
Drownings	24	0.20	34
All Other	76	0.63	36
All	1080	8.99	4

Tennessee

Cause	Deaths	Rate*	Rank
Falls	103	1.95	33
Poisonings	67	1.26	27
Fires/Burns	114	2.18	7
Suffocations	24	0.45	23
Drownings	12	0.23	27
All Other	67	1.29	5
All	387	7.35	19

Virginia

Cause	Deaths	Rate*	Rank
Falls	117	1.75	44
Poisonings	114	1.71	16
Fires/Burns	91	1.37	18
Suffocations	19	0.29	44
Drownings	15	0.23	27
All Other	42	0.63	36
All	398	5.99	36

Rhode Island

Cause	Deaths	Rate*	Rank
Falls	29	2.93	11
Poisonings	2	0.21	49
Fires/Burns	7	0.72	45
Suffocations	4	0.39	31
Drownings	3	0.28	18
All Other	3	0.30	47
All	48	4.83	46

Texas

Cause	Deaths	Rate*	Rank
Falls	364	1.93	36
Poisonings	381	2.00	15
Fires/Burns	220	1.17	30
Suffocations	82	0.44	26
Drownings	79	0.42	6
All Other	170	0.90	20
All	1296	6.85	27

Washington

Cause	Deaths	Rate*	Rank
Falls	138	2.51	22
Poisonings	180	3.26	4
Fires/Burns	51	0.93	38
Suffocations	27	0.49	17
Drownings	18	0.32	12
All Other	33	0.63	36
All	447	8.14	7

* per 100,000 persons

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West Virginia

Cause	Deaths	Rate*	Rank
Falls	66	3.66	3
Poisonings	19	1.03	31
Fires/Burns	36	1.99	8
Suffocations	7	0.38	32
Drownings	5	0.27	21
All Other	23	1.28	6
All	156	8.61	5

Wisconsin

Cause	Deaths	Rate*	Rank
Falls	194	3.76	2
Poisonings	34	0.65	45
Fires/Burns	56	1.09	33
Suffocations	23	0.45	23
Drownings	9	0.18	39
All Other	47	0.90	20
All	363	7.02	23

Wyoming

Cause	Deaths	Rate*	Rank
Falls	12	2.55	21
Poisonings	8	1.63	19
Fires/Burns	3	0.52	49
Suffocations	3	0.66	4
Drownings	1	0.24	25
All Other	6	1.42	3
All	33	7.01	24

* per 100,000 persons

Data Source: National Vital Statistics System, 1992-1999.

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Chapter 6 -- Unintentional Home Injury Trends

This chapter addresses trends in unintentional injury in the home environment over an eight-year period for deaths (1992–1999), five-year period for nonfatal injuries (1997–2001), and eight-year period for injuries resulting in an emergency department visit (1993–2000). Note that emergency department visit data from 1995 are missing due to data processing errors for the location of injury variable in the National Hospital Ambulatory Medical Care Survey - Emergency Department dataset. Conducting an analysis of trends is important for understanding the changes in the rates of fatal, nonfatal and emergency department visit home injuries over time. This information can be used to determine where intervention efforts may have been successful and where future efforts may potentially be focused.

Unintentional Home Injury Death

Rates of home injury death increased an average of approximately 2 percent per year between 1992 and 1999 **(Figure 6.1)**. Rates of death were consistently higher for unintentional injuries that occurred in the home, compared to those not occurring in the home and those where the location was unknown. Trends in fatal injuries across places of occurrence have increased at similar rates over time. However, while rates of unintentional injury death occurring in the home continued to rise between 1998 and 1999, rates of unintentional injury death not occurring in the home decreased. The factors that may have contributed to this decrease are not clear, although changes in highway safety programs may have played a role, especially since motor vehicle crashes comprise a large percentage of all non-home injury deaths. The increasing rates of home injury death suggest that more work is needed to improve safety in the home, whether the changes are behavioral, environmental or both.

Figure 6.1. Unintentional Fatal Injuries. Rate (per 100,000 persons), by Location, U.S., 1992-1999.

Data Source: National Vital Statistics System, 1992-1999.

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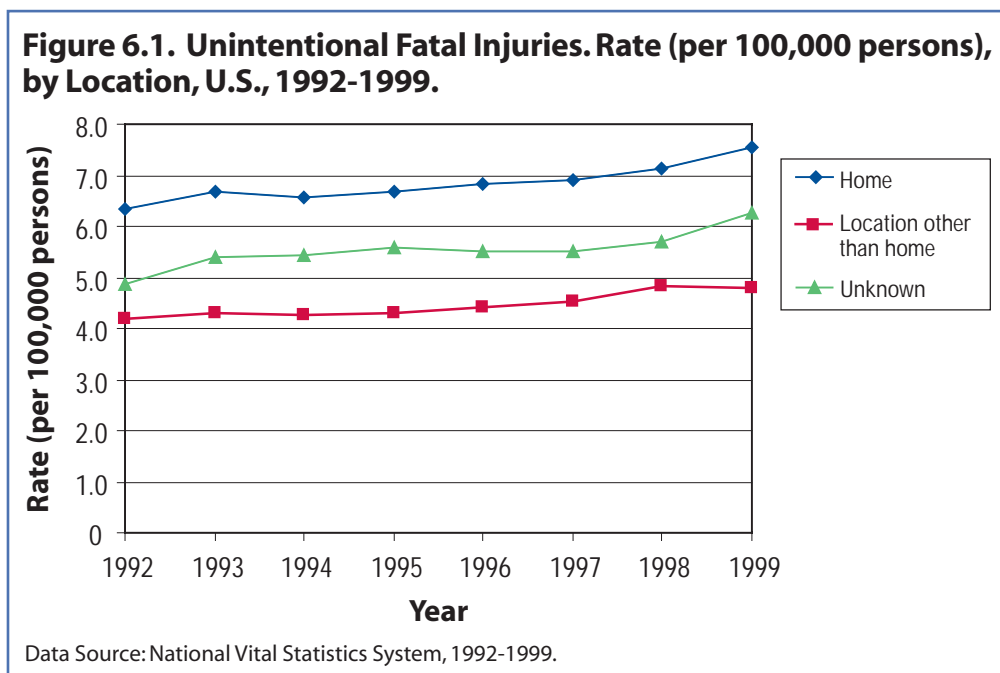
Rates of unintentional home injury death are consistently higher for males than females **(Figure 6.2)**. Rates were fairly steady during the period 1992-1999; rates for men increased an average of 1 percent per year, while rates for women increased an average of 2 percent per year.

Figure 6.2. Unintentional Fatal Injuries in the Home. Rate (per 100,000 persons), by Sex, U.S., 1992-1999.

Data Source: National Vital Statistics System, 1992-1999.
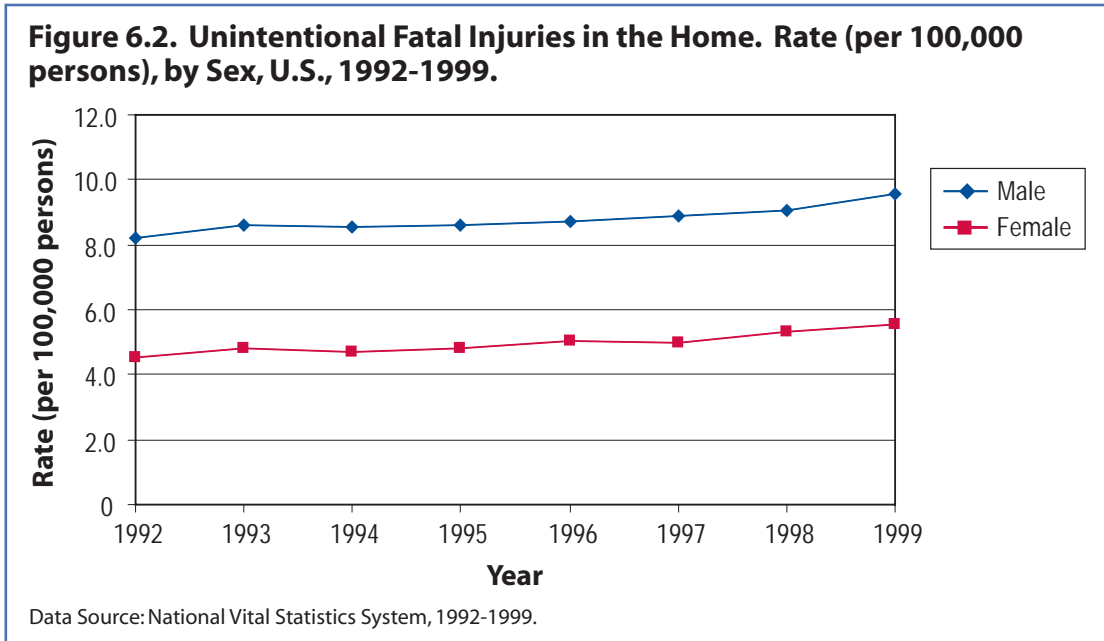
Adults at least 70 years of age had consistently higher rates of unintentional home injury death, compared with all other age groups **(Figure 6.3)**. They also had the largest increases between 1995 and 1999. Between 1992 and 1999, rates of unintentional home injury death increased slightly for adults between the ages of 60 and 69 and those between 20 and 59, while steady decreases in home injury deaths were seen for children younger than 5, with the exception of a small increase between 1998 and 1999. Children between 5 and 9 and adolescents between 10 and 19 experienced similar rates, with little fluctuation over time. Trends in unintentional home injury death across age groups were similar for males and females, although males experienced consistently higher rates than females **(Figure 6.4, Figure 6.5)**.

Figure 6.3. Unintentional Fatal Injuries in the Home. Rate (per 100,000 persons), by Age Group, Both Sexes, U.S., 1992-1999.

Data Source: National Vital Statistics System, 1992-1999.
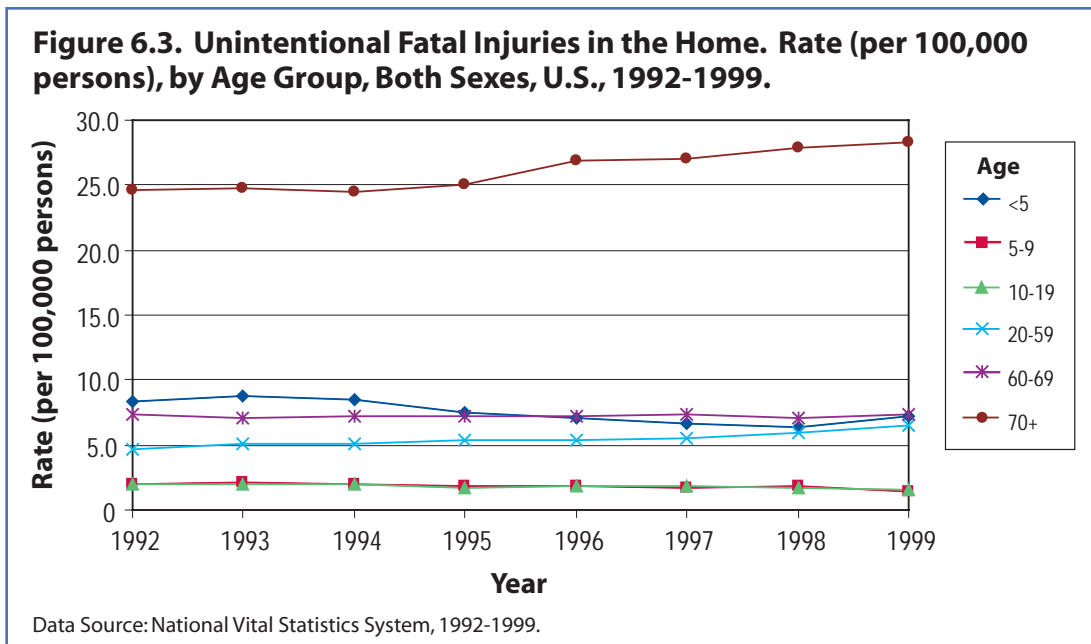
Figure 6.4. Unintentional Fatal Injuries in the Home Involving Males. Rate (per 100,000 persons), by Age Group, U.S., 1992-1999.
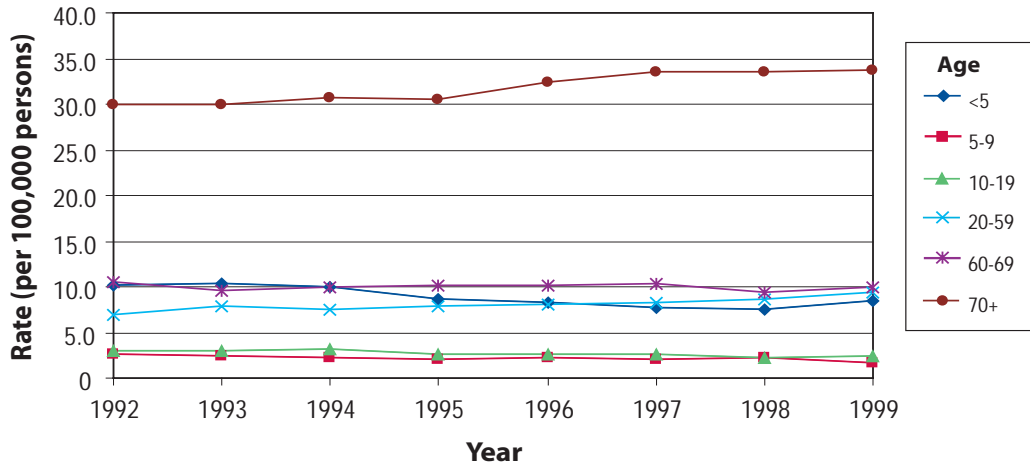
Data Source: National Vital Statistics System, 1992-1999.

Figure 6.5. Unintentional Fatal Injuries in the Home Involving Females. Rate (per 100,000 persons), by Age Group, U.S., 1992-1999.
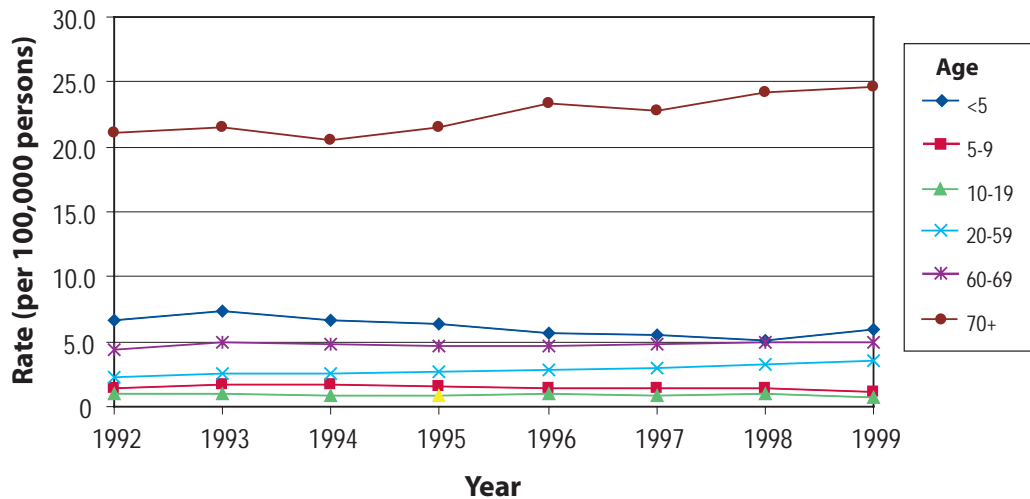
Data Source: National Vital Statistics System, 1992-1999.

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Nonfatal Unintentional Home Injury

Rates of nonfatal unintentional injuries that occurred in the home were consistently lower than those not occurring in the home between 1997 and 2001 **(Figure 6.6)**. Overall, rates of nonfatal unintentional injuries decreased between 1997 and 2001, although injuries occurring in the home decreased at a slower rate than those not occurring at home. In particular, between 1997 and 2001, nonfatal unintentional injuries occurring in the home decreased an average of 7 percent per year, while nonfatal unintentional injuries that occurred in a location other than the home decreased an average of 8 percent per year.

Figure 6.6. Nonfatal Unintentional Injuries. Rate (per 100,000 persons), by Location, U.S., 1997-2001.

Data Source: National Health Interview Survey, 1997-2001.
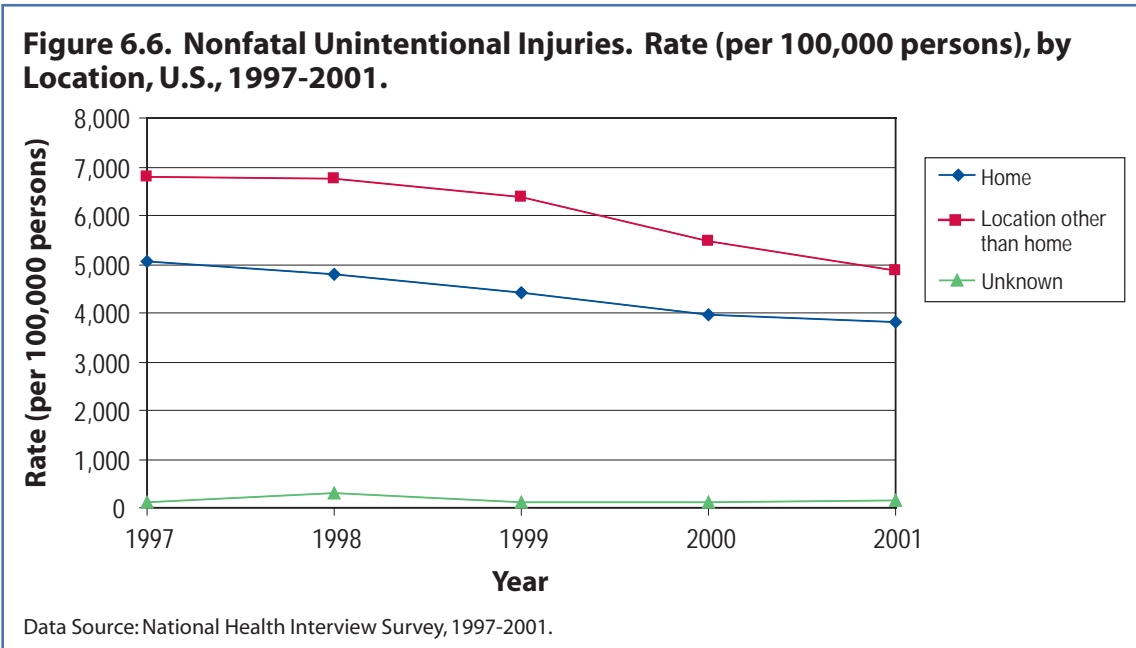
Rates of nonfatal unintentional home injuries were similar for males and females **(Figure 6.7)**, unlike death rates where males had higher rates than females **(Figure 6.2)**. Both sexes experienced decreasing rates between 1997 and 2000, where the rate for males continued to decrease into 2001 while the rate for females slightly increased. Overall, males experienced an average decrease in nonfatal unintentional home injuries of 8 percent per year, while females experienced an overall decrease of 6 percent per year.

Figure 6.7. Nonfatal Unintentional Home Injuries. Rate (per 100,000 persons), by Sex, U.S., 1997-2001.

Data Source: National Health Interview Survey, 1997-2001.
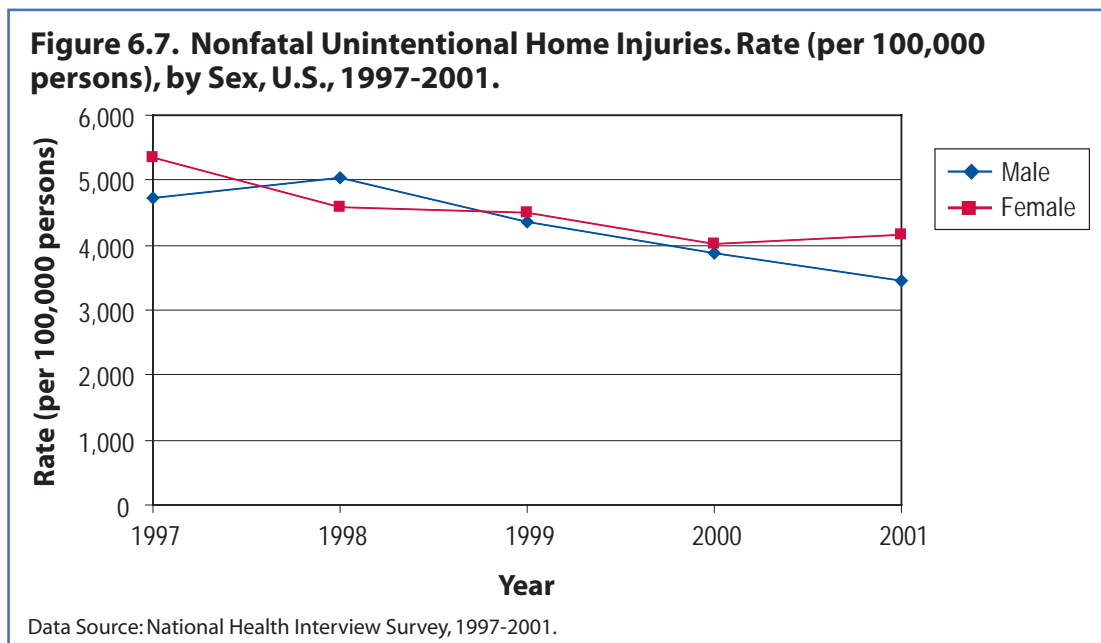
Between 1997 and 2001, adults 70 and older had the highest rates of nonfatal unintentional home injuries **(Figure 6.8)**, where females **(Figure 6.10)** had higher rates than males **(Figure 6.9)**. Both males and females 70 and older and those between 60 and 69 had large increases in nonfatal unintentional home injury rates between 2000 and 2001. Since 1999, children younger than 5 and adolescents between 10 and 19 experienced increasing rates. These increases are seen largely for males younger than 5, who had the highest rates of nonfatal unintentional home injury from 1999 to 2001, compared to males in all other age groups. The increases seen among 10-to-19-year-olds were due to increasing rates among females **(Figure 6.10)**; males in this age group experienced decreasing rates over the time period **(Figure 6.9)**.

Figure 6.8. Nonfatal Unintentional Home Injuries Involving Both Sexes. Rate (per 100,000 persons), by Age Group, U.S., 1997-2001.

Data Source: National Health Interview Survey, 1997-2001.

Figure 6.9. Nonfatal Unintentional Home Injuries Involving Males. Rate (per 100,000 persons), by Age Group, U.S., 1997-2001.

Data Source: National Health Interview Survey, 1997-2001.

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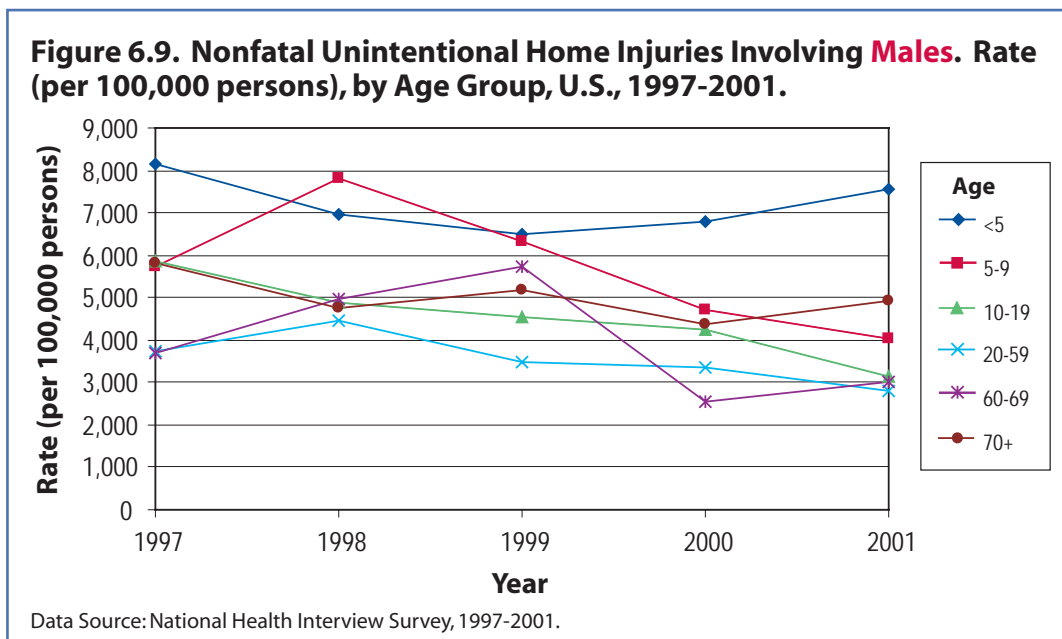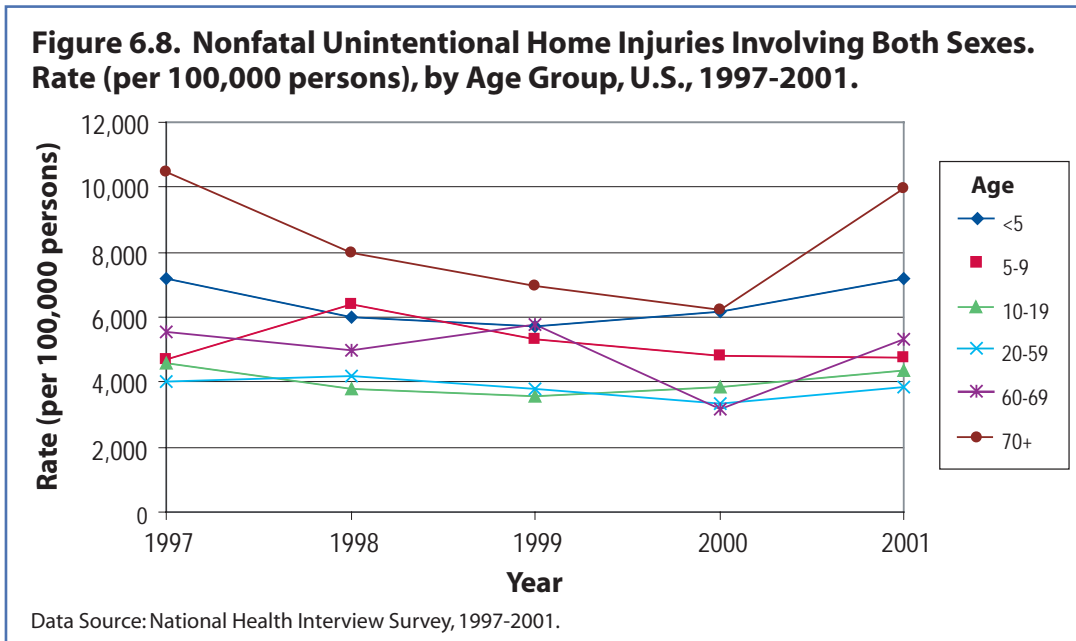
**Figure 6.10. Nonfatal Unintentional Home Injuries Involving Females.
Rate (per 100,000 persons), by Age Group, U.S., 1997-2001.**
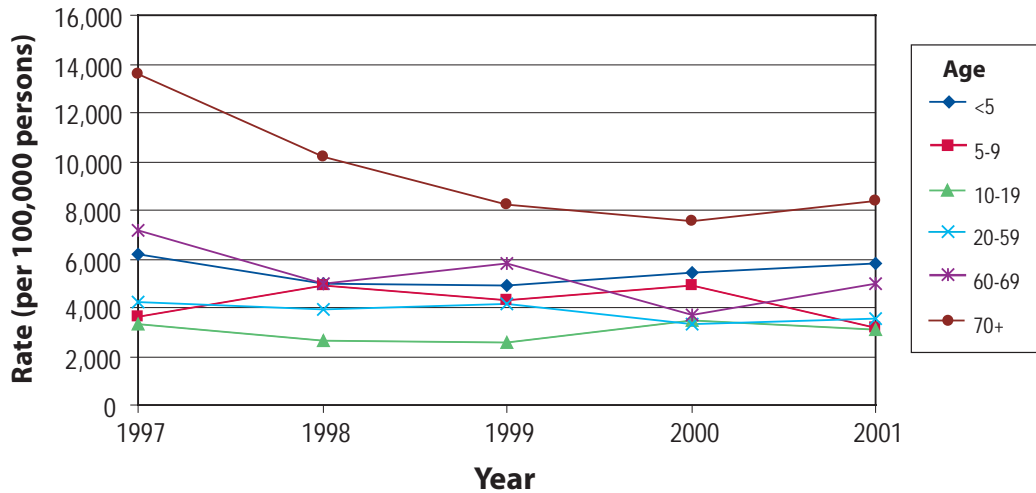
Data Source: National Health Interview Survey, 1997-2001.

Unintentional Home Injury Resulting in Emergency Department Visits

Between 1993 and 2000, rates of unintentional injury resulting in an emergency department visit were consistently lower for injuries that occurred in the home compared with injuries that did not occur in the home **(Figure 6.11)**. Rates of home injury resulting in an emergency department visit increased between 1995 and 2000, and during this time, never exceeded the rates for injury resulting in emergency department visits that occurred in a location other than the home. Between 1993 and 2000, males and females experienced similar rates of unintentional home injury that resulted in an emergency department visit **(Figure 6.12)**.

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**Figure 6.11. Nonfatal Unintentional Injuries Resulting in Emergency
Department Visits. Rate (per 100,000 persons), by Location, U.S., 1993-2000.**
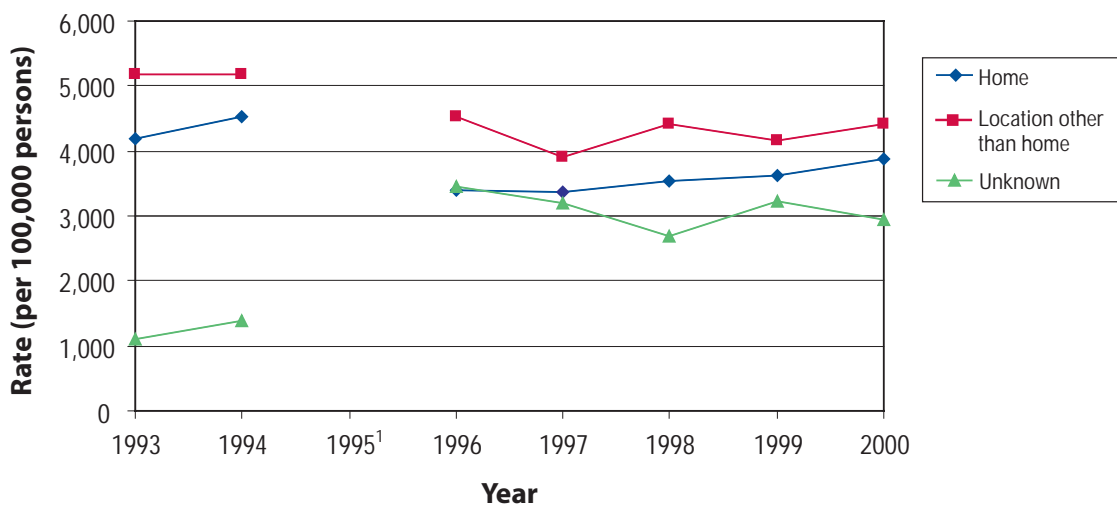
[1]1995 data are missing.
Data Source: National Hospital Ambulatory Medical Care Survey -- Emergency Department, 1993-2000.

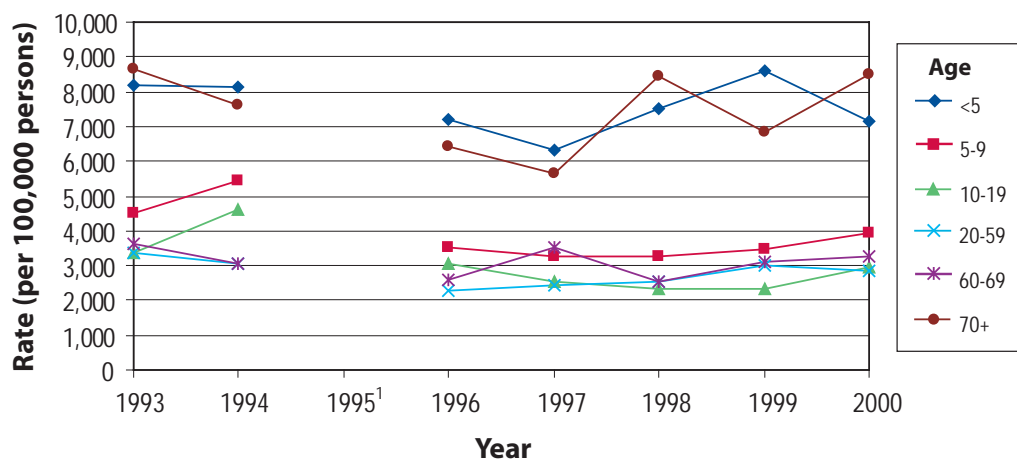**Figure 6.12. Nonfatal Unintentional Home Injuries Resulting in Emergency Department Visits. Rate (per 100,000 persons), by Sex, U.S., 1993-2000.**
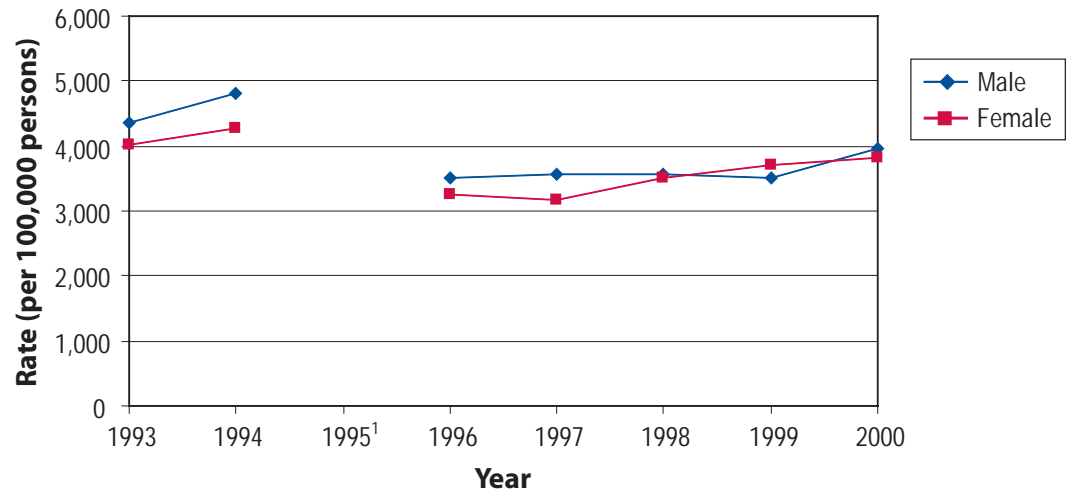
[1]1995 data are missing.
Data Source: National Hospital Ambulatory Medical Care Survey -- Emergency Department, 1993-2000.

Children younger than 5 had the highest rates of unintentional home injury resulting in an emergency department visit **(Figure 6.13)**. These high rates can be attributed to males younger than 5 **(Figure 6.14)**, compared with the rates for females in the same age group **(Figure 6.15)**.

Females 70 and older had the highest rates of unintentional home injury resulting in an emergency department visit, compared to females in all other age groups, between 1993 and 2000 **(Figure 6.15)**. In contrast, males 70 and older experienced much lower rates of emergency department visits than males less than 5 or between 10 and 19 **(Figure 6.14)**.

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Figure 6.13. Nonfatal Unintentional Home Injuries Resulting in Emergency Department Visits, Both Sexes. Rate (per 100,000 persons), by Age Group, U.S., 1993-2000.
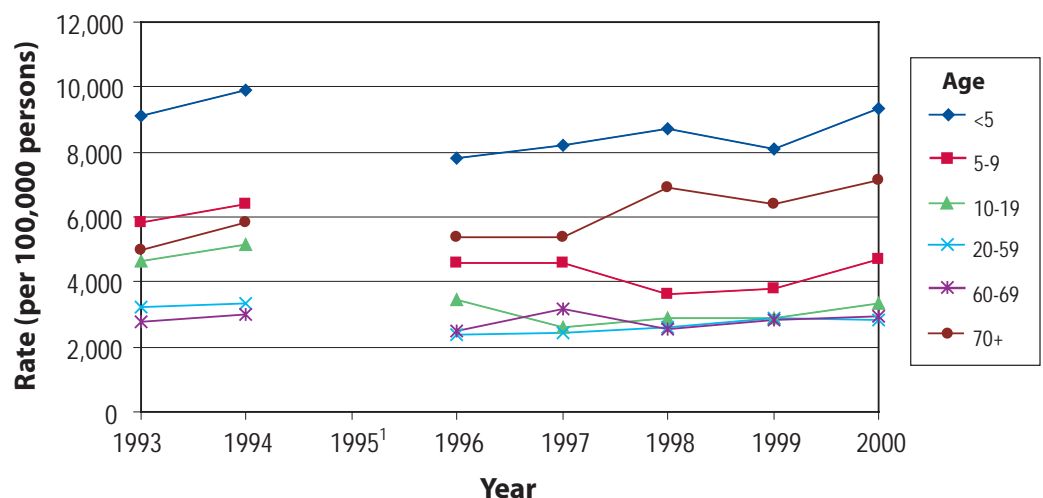
[1]1995 data are missing.
Data Source: National Hospital Ambulatory Medical Care Survey -- Emergency Department, 1993-2000.

Figure 6.14. Nonfatal Unintentional Home Injuries Involving Males Resulting in Emergency Department Visits. Rate (per 100,000 persons), by Age Group, U.S., 1993-2000.
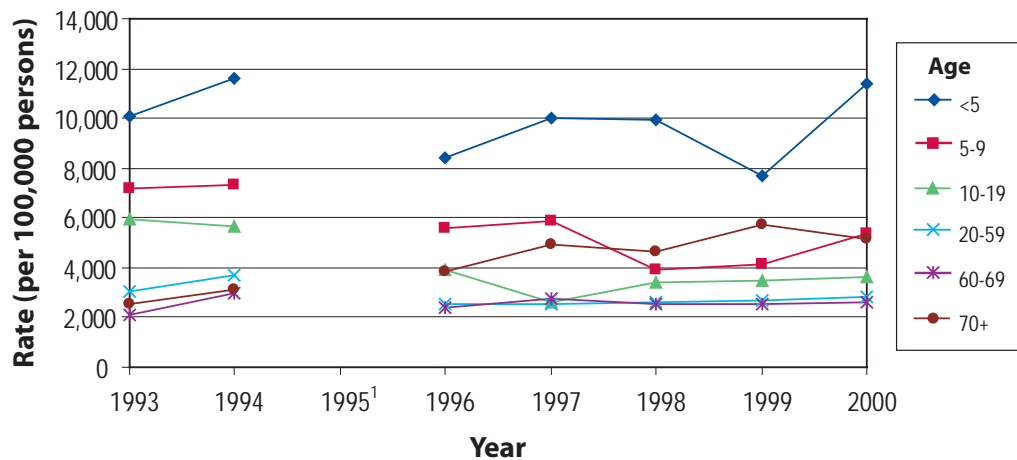
[1]1995 data are missing.
Data Source: National Hospital Ambulatory Medical Care Survey -- Emergency Department, 1993-2000.

Figure 6.15. Nonfatal Unintentional Home Injuries Involving Females Resulting in Emergency Department Visits. Rate (per 100,000 persons), by Age Group, U.S., 1993-2000.

[1]1995 data are missing.
Data Source: National Hospital Ambulatory Medical Care Survey -- Emergency Department, 1993-2000.

Trends in Unintentional Fatal and Nonfatal Home Injury by Leading Causes

Falls

Deaths — Between 1992 and 1999, adults 70 and older had the highest rates of death due to falls that occurred in the home, compared with all other age groups, followed by adults between 60 and 69 **(Figure 6.16)**. Between 1995 and 1999, rates of fall death increased among adults 70 and older, while rates in all other age groups remained relatively stable. Overall, rates of death from falls occurring in the home increased an average of 4 percent per year across all age groups. Males consistently experienced higher rates of death than females over the eight-year period **(Figure 6.17)**. Both sexes, however, experienced similarly increasing trends over time.

Figure 6.16. Fatal Falls in the Home. Rate (per 100,000 persons), by Age Group, U.S., 1992-1999.
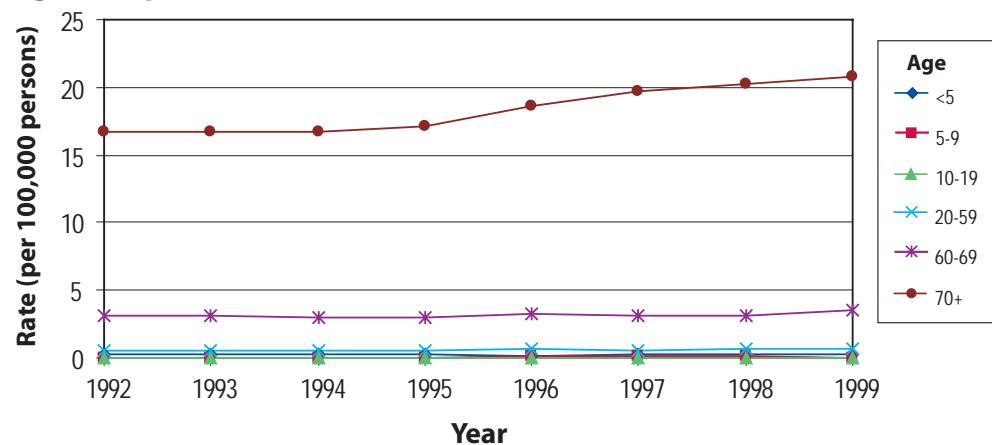
Data Source: National Vital Statistics System, 1992-1999.

Figure 6.17. Fatal Falls in the Home. Rate (per 100,000 persons), by Sex, U.S., 1992-1999.

Data Source: National Vital Statistics System, 1992-1999.

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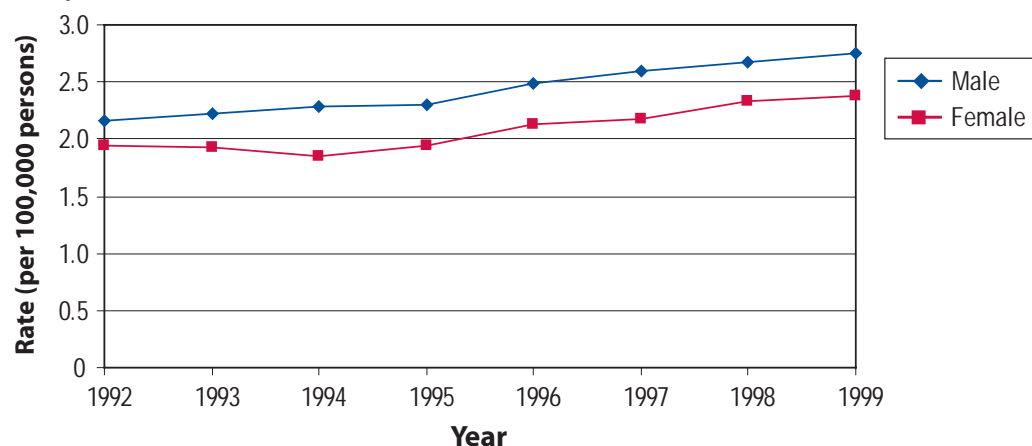
Nonfatal Injuries — Similar to fall deaths, adults 70 and older have the highest rates of nonfatal unintentional fall injuries that occur in the home **(Figure 6.18)**. While adults 60 to 69 have the second highest rates of fall death **(Figure 6.16)**, children younger than 5 have the second highest rate of nonfatal home falls. The pattern of nonfatal fall injuries that occur in the home is different from those for fall deaths **(Figure 6.16)** and falls requiring emergency department care **(Figure 6.20)**. With the exception of an increase between 2000 and 2001, nonfatal fall injuries occurring in the home decreased over the 1997 to 2000 time period, but worsened in severity as fall deaths increased between 1997 and 1999 and fall injuries resulting in an emergency department visit increased between 1997 and 2000. In addition, unlike fall deaths or falls resulting in an emergency department visit, females consistently had higher rates of nonfatal unintentional home fall injuries over time **(Figure 6.19)**.

Figure 6.18. Nonfatal Falls in the Home. Rate (per 100,000 persons), by Age Group, U.S., 1997-2001.
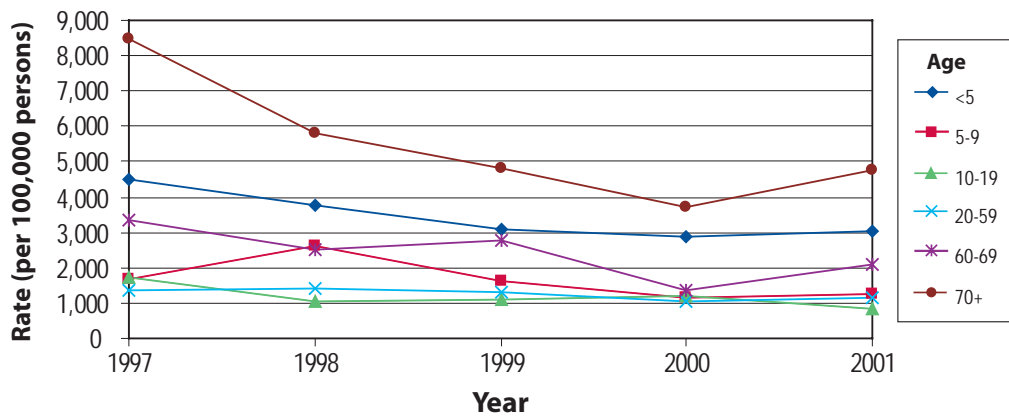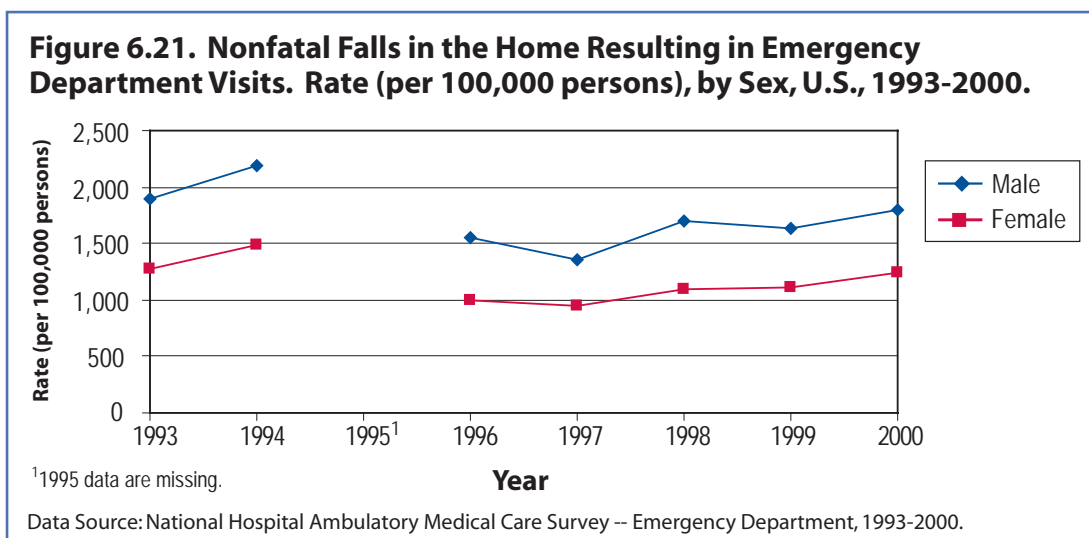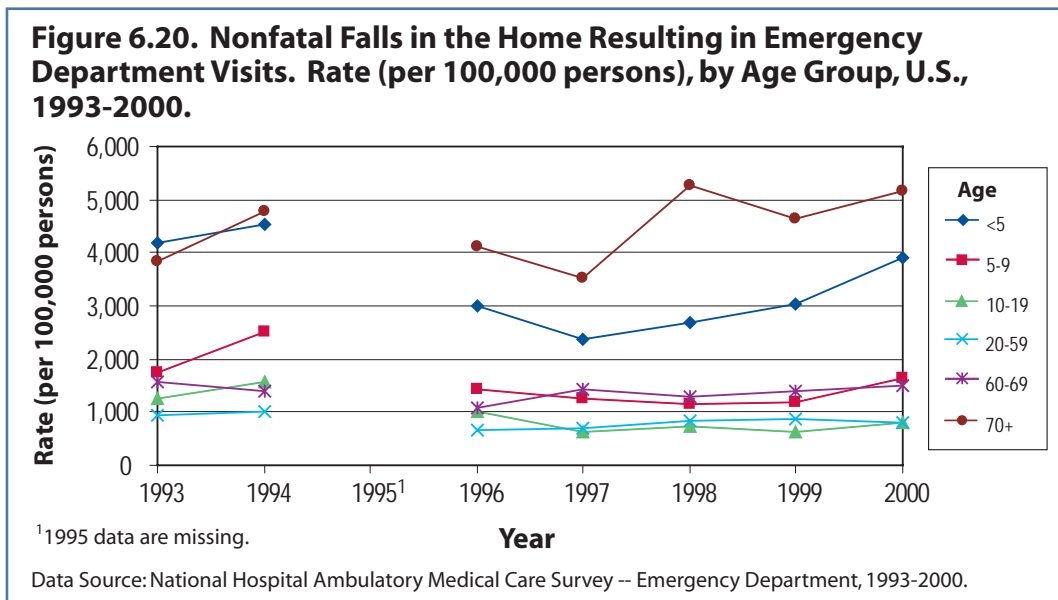
Data Source: National Health Interview Survey, 1997-2001.

Figure 6.19. Nonfatal Falls in the Home. Rate (per 100,000 persons), by Sex, U.S., 1997-2001.
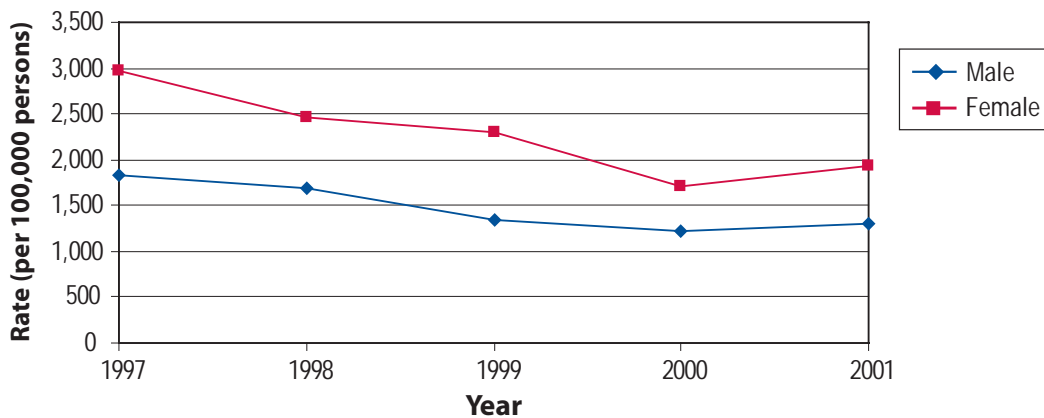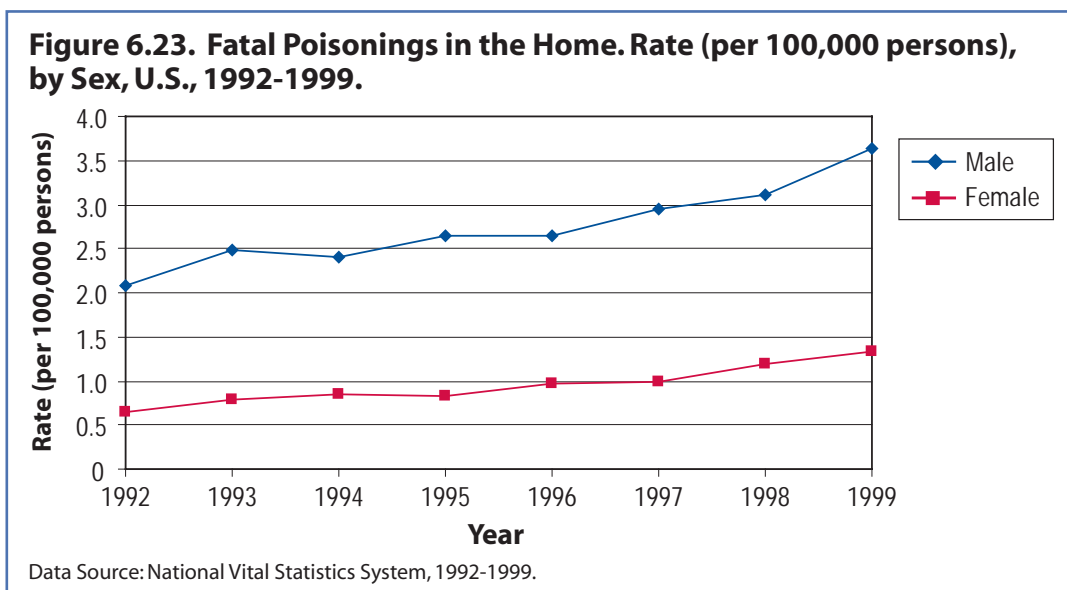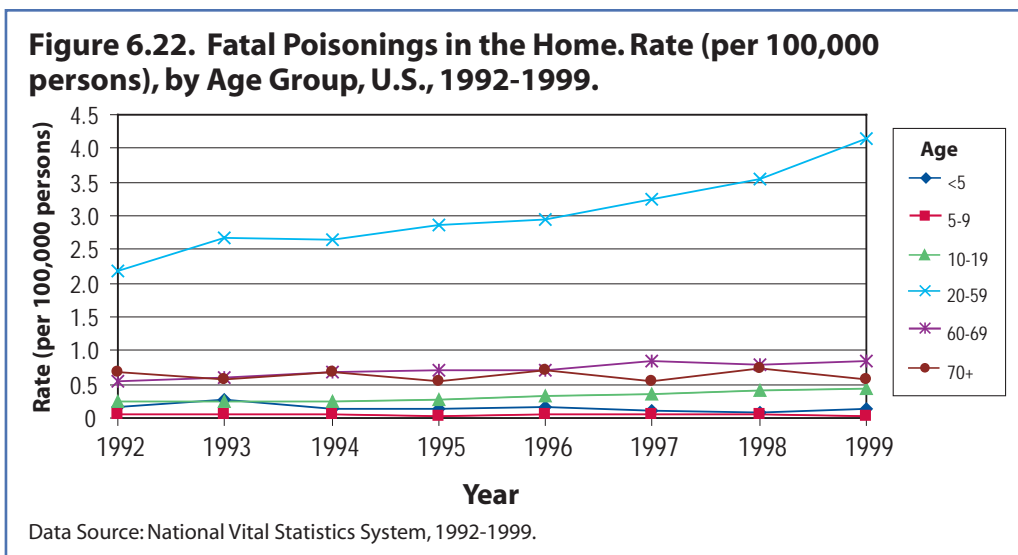
Data Source: National Health Interview Survey, 1997-2001.

Emergency Department Visits — Rates of falls occurring in the home and resulting in an emergency department visit were greatest for adults 70 and older, followed by children younger than 5 years of age **(Figure 6.20)**. Beginning in 1997, large increases in injuries requiring emergency department care were seen for adults 70 and older and children under 5. Between 1999 and 2000, increases were also seen for children between 5 and 9 and adolescents between 10 and 19. The increased rates over time can have important medical care cost implications to the individuals injured, as well as their families. Between 1995 and 2000, males had higher rates of home fall injuries resulting in an emergency department visit, compared with females **(Figure 6.21)**. Trends over this period were similar for both sexes.

Figure 6.20. Nonfatal Falls in the Home Resulting in Emergency Department Visits. Rate (per 100,000 persons), by Age Group, U.S., 1993-2000.

[1]1995 data are missing.

Data Source: National Hospital Ambulatory Medical Care Survey -- Emergency Department, 1993-2000.

Figure 6.21. Nonfatal Falls in the Home Resulting in Emergency Department Visits. Rate (per 100,000 persons), by Sex, U.S., 1993-2000.

[1]1995 data are missing.

Data Source: National Hospital Ambulatory Medical Care Survey -- Emergency Department, 1993-2000.

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Poisonings

Deaths — Rates of death due to poisonings in the home increased between 1992 and 1999 among adults between the ages of 20 and 59 **(Figure 6.22)**. Overall rates were highest among adults between 40 and 49 followed by adults between 30 and 39. Poisoning deaths occurring in the home remained relatively stable between 1992 and 1999 for all other age groups, although slight increases are seen among 10-to-19-year-olds **(Figure 6.22)**. Males consistently experienced higher rates of poisoning death between 1992 and 1999, compared with females **(Figure 6.23)**. Although home poisoning deaths increased for both males and females over the time period, rates among males increased at a slightly faster rate than those for females.

Figure 6.22. Fatal Poisonings in the Home. Rate (per 100,000 persons), by Age Group, U.S., 1992-1999.

Data Source: National Vital Statistics System, 1992-1999.

Figure 6.23. Fatal Poisonings in the Home. Rate (per 100,000 persons), by Sex, U.S., 1992-1999.

Data Source: National Vital Statistics System, 1992-1999.

Nonfatal Injuries — Trends in nonfatal unintentional poisonings occurring in the home cannot be assessed due to missing data between 1997 and 1999 across all age groups **(Table 6.1)** and both sexes **(Table 6.2)**. Poisoning data from the National Health Interview Survey were maintained in two separate files, one file containing 1997–1999 data and the other containing 2000–2001 data. In the former, data on injury intent and location of the injury event were missing. Therefore, poisonings occurring between 1997 and 1999 were treated as "unknown" and excluded from all trend analyses.

Table 6.1. Nonfatal Poisonings in the Home. Rate (per 100,000 persons), by Age Group, U.S., 1997-2001.

Age	1997	1998	1999	2000	2001
<5	*	*	*	1,202	918
5-9	*	*	*	199	287
10-19	*	*	*	231	156
20-59	*	*	*	138	229
60-69	*	*	*	332	121
70+	*	*	*	304	273
Total Rate	*	*	*	260	267

* - data missing.

Data Source: National Health Interview Survey, 1997-2001.

Table 6.2. Nonfatal Poisonings in the Home. Rate (per 100,000 persons), by Sex, U.S., 1997-2001.

Sex	1997	1998	1999	2000	2001
Male	*	*	*	177	165
Female	*	*	*	340	365
Total Rate	*	*	*	260	267

* - data missing.

Data Source: National Health Interview Survey, 1997-2001.

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Emergency Department Visits — Between 1996 and 2000, children younger than 5 had significantly higher rates of poisonings resulting in an emergency department visit, compared with all other age groups **(Figure 6.24)**. With the exception of adults between 60 and 69, patterns in the rates of poisoning across all age groups were similar; poisonings resulting in an emergency department visit increased between 1996 and 1998, decreased in 1999 and increased again in 2000. However, these changes are only significant for children younger than 5. Males and females had similar rates and patterns of poisoning injuries resulting in an emergency department visit over time **(Figure 6.25)**.

Figure 6.24. Nonfatal Poisoning in the Home Resulting in Emergency Department Visits. Rate (per 100,000 persons), by Age Group, U.S., 1993-2000.

[1] 1995 data are missing.

Data Source: National Hospital Ambulatory Medical Care Survey -- Emergency Department, 1993-2000.

Figure 6.25. Nonfatal Poisonings in the Home Resulting in Emergency Department Visits. Rate (per 100,000 persons), by Sex, U.S., 1993-2000.

[1] 1995 data are missing.

Data Source: National Hospital Ambulatory Medical Care Survey -- Emergency Department, 1993-2000.

Fires and Burns

Deaths — While fires and burns remain the leading cause of home injury-related death for children younger than 5, rates significantly decreased over time among this age group **(Figure 6.26)**. Rates of home fire/burn deaths also decreased, although not as radically, for adults 70 and older. Deaths due to fires and burns occurring in the home decreased an average of 5 percent per year over the seven-year time period between 1992 and 1999 across all age groups. Overall, males and females experienced similar decreasing trends in fatal home injuries resulting from fires and burns, although males had consistently higher rates than females **(Figure 6.27)**.

Figure 6.26. Fatal Fires/Burns in the Home. Rate (per 100,000 persons), by Age Group, U.S., 1992-1999.
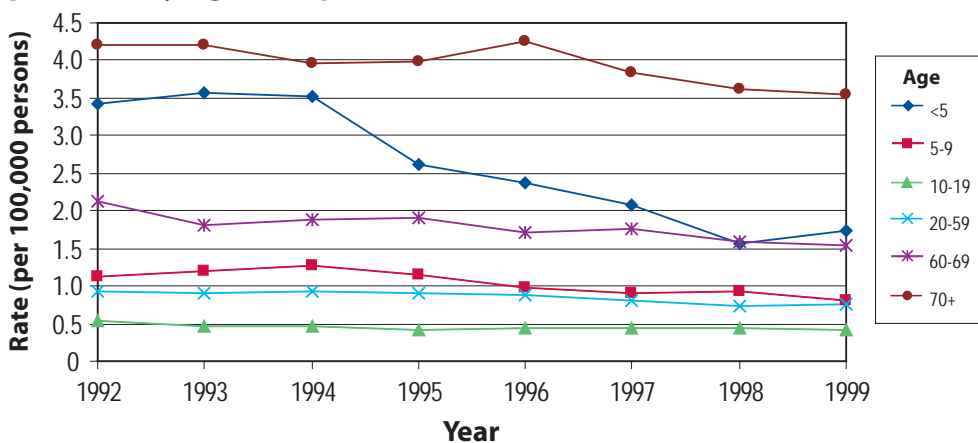
Data Source: National Vital Statistics System, 1992-1999.

Figure 6.27. Fatal Fires/Burns in the Home. Rate (per 100,000 persons), by Sex, U.S., 1992-1999.

Data Source: National Vital Statistics System, 1992-1999.

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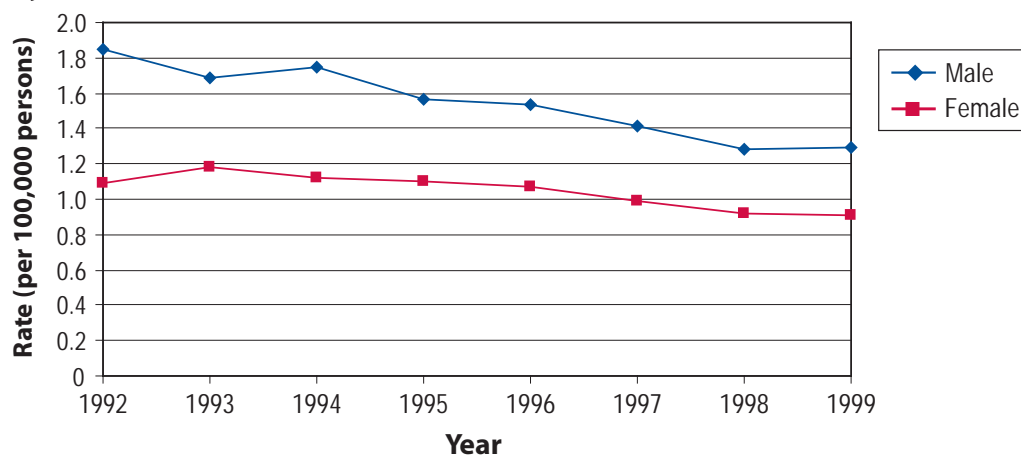
Nonfatal Injuries — Children younger than 5 experienced large reductions in the rate of nonfatal unintentional fire and burn home injuries between 1998 and 2000 **(Figure 6.28)**. Children younger than 5 had the highest rates of nonfatal unintentional fire and burn home injuries between 1997 and 2001, with the exception of 2000, where older children and adolescents between 10 and 19 and adults 70 and older had the highest rates. Males and females had unstable rates of nonfatal unintentional fire and burn home injuries over the five-year time period **(Figure 6.29)**.

Figure 6.28. Nonfatal Fires/Burns in the Home. Rate (per 100,000 persons), by Age Group, U.S., 1997-2001.
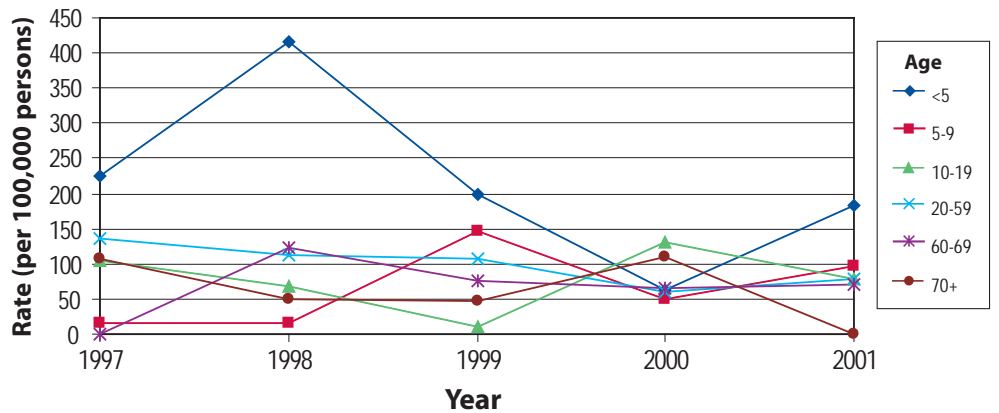
Data Source: National Health Interview Survey, 1997-2001.

Figure 6.29. Nonfatal Fires/Burns in the Home. Rate (per 100,000 persons), by Sex, U.S., 1997-2001.
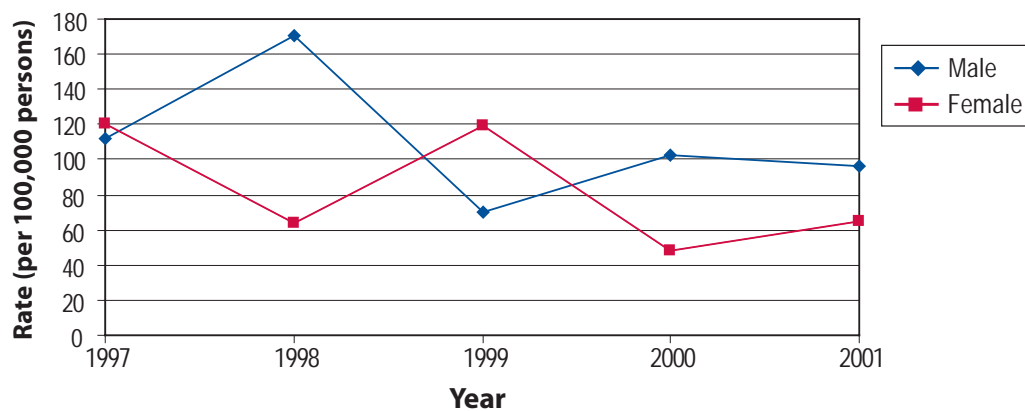
Data Source: National Health Interview Survey, 1997-2001.

Emergency Department Visits — Similar to nonfatal fire and burn injuries occurring in the home (Figure 6.28), fire and burn home injuries resulting in emergency department visits were consistently higher for children younger than 5, compared with all other age groups (Figure 6.30). These trends are different for fire and burn home injuries resulting in death, where adults 70 and older had consistently higher rates, compared with all other age groups (Figure 6.26). Patterns of fire and burn home injuries resulting in an emergency department visit varied across age groups between 1993 and 2000, and clear patterns do not emerge. Males and females had a similar pattern of fire and burn home injury rates resulting in emergency department visits over time (Figure 6.31).


Figure 6.30. Nonfatal Fires/Burns in the Home Resulting in Emergency Department Visits. Rate (per 100,000 persons), by Age Group, U.S., 1993-2000.
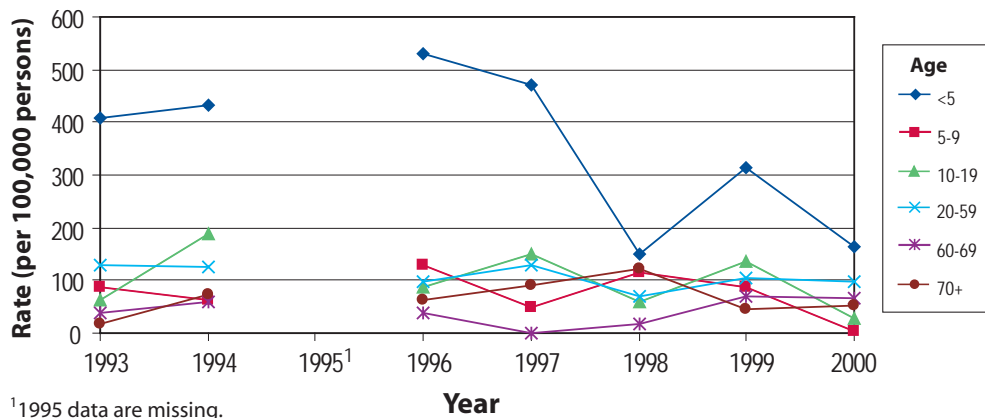
[1]1995 data are missing.

Data Source: National Hospital Ambulatory Medical Care Survey -- Emergency Department, 1993-2000.

Figure 6.31. Nonfatal Fires/Burns in the Home Resulting in Emergency Department Visits. Rate (per 100,000 persons), by Sex, U.S., 1993-2000.

[1]1995 data are missing.

Data Source: National Hospital Ambulatory Medical Care Survey -- Emergency Department, 1993-2000.
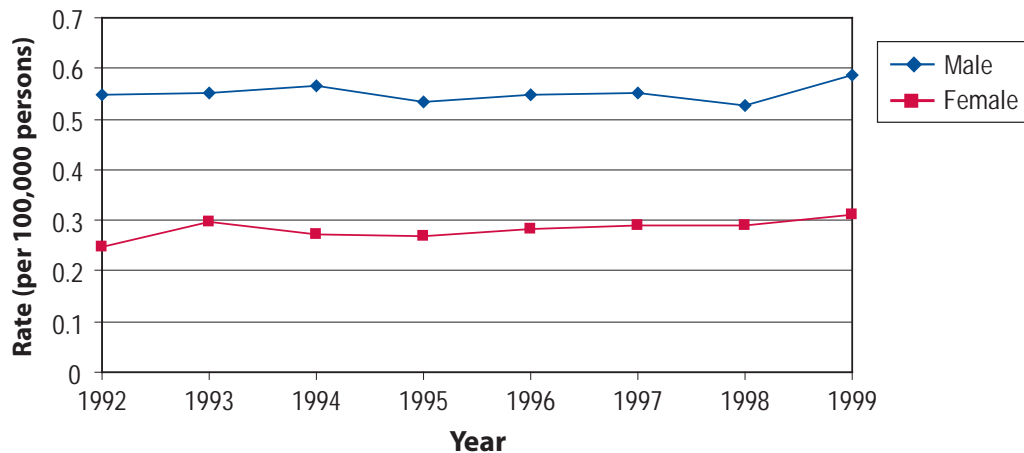
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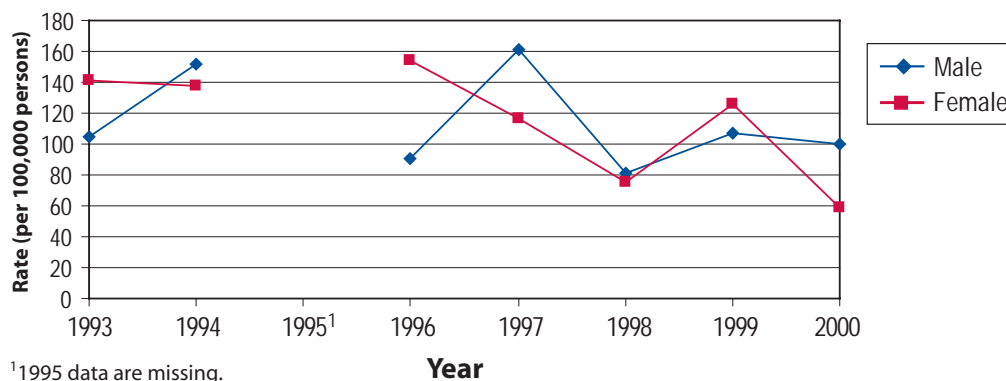
Choking and Suffocation

Deaths — Rates of fatal choking and suffocations occurring in the home were consistently higher for children younger than 5, compared with all other age groups, over time **(Figure 6.32)**. Rates of fatal choking and suffocation injuries occurring in the home remained relatively constant over time, with the exception of an increase among children younger than 5 between 1998 and 1999. Males had consistently higher rates of home choking and suffocation deaths than females between 1992 and 1999 **(Figure 6.33)**. For both sexes, death rates did not change over time.

Figure 6.32. Fatal Chokings/Suffocations in the Home. Rate (per 100,000 persons), by Age Group, U.S., 1992-1999.
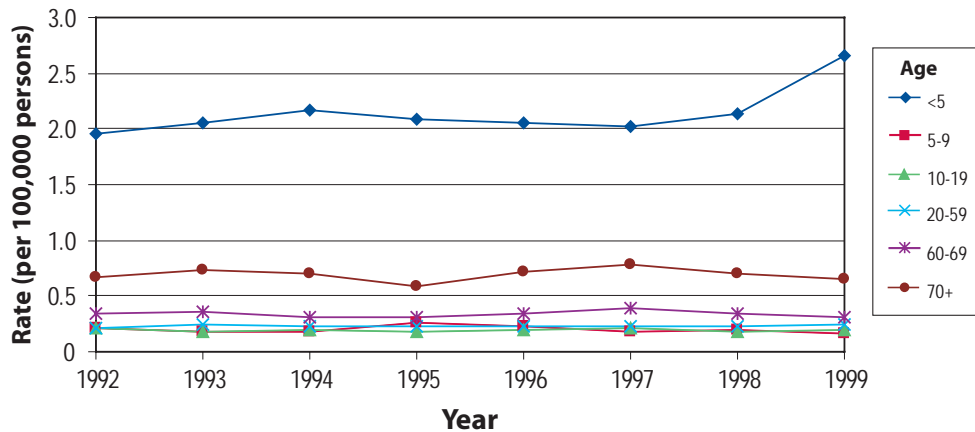
Data Source: National Vital Statistics System, 1992-1999.

**Figure 6.33. Fatal Chokings/Suffocations in the Home. Rate (per 100,000 persons), by Sex, U.S., 1992-1999.**

Data Source: National Vital Statistics System, 1992-1999.

Nonfatal Injuries and Emergency Department Visits — The low number of nonfatal choking and suffocation injuries prohibits the comparison of trends.

Drownings and Submersions

Deaths — Between 1992 and 1999, children younger than 5 had consistently higher rates of drownings occurring in the home, compared to all other age groups, followed by adults 70 and older **(Figure 6.34)**. Rates of drowning in the home remained relatively steady over time across all age groups and both sexes **(Figure 6.35)**. Males had consistently higher rates of home drownings than females between 1992 and 1999.

Figure 6.34. Drownings/Fatal Submersions in the Home. Rate (per 100,000 persons), by Age Group, U.S., 1992-1999.

Data Source: National Vital Statistics System, 1992-1999.

Figure 6.35. Drownings/Fatal Submersions in the Home. Rate (per 100,000 persons), by Sex, U.S., 1992-1999.

Data Source: National Vital Statistics System, 1992-1999.
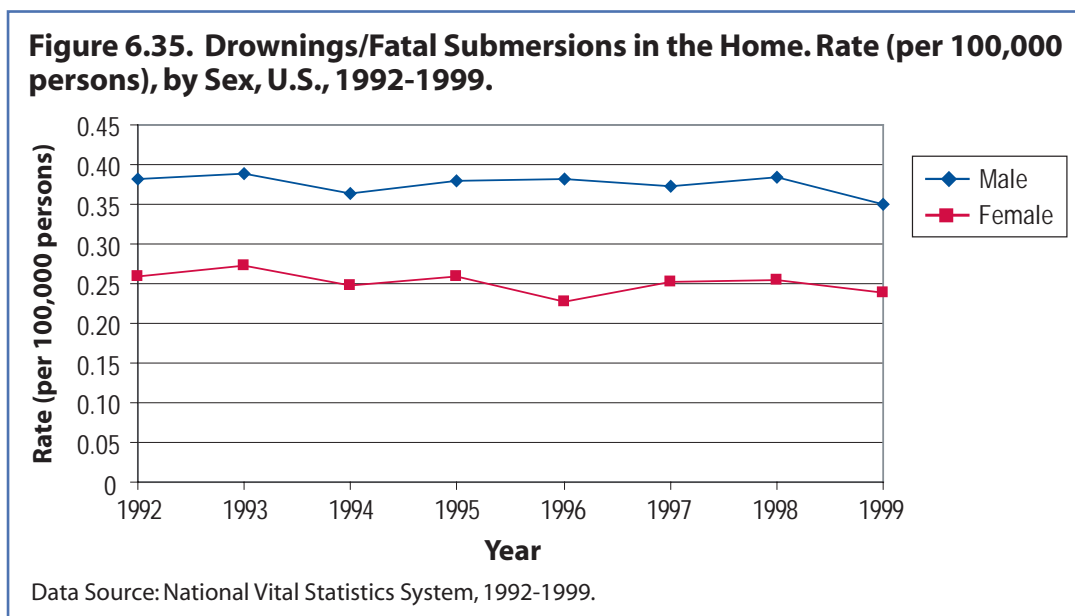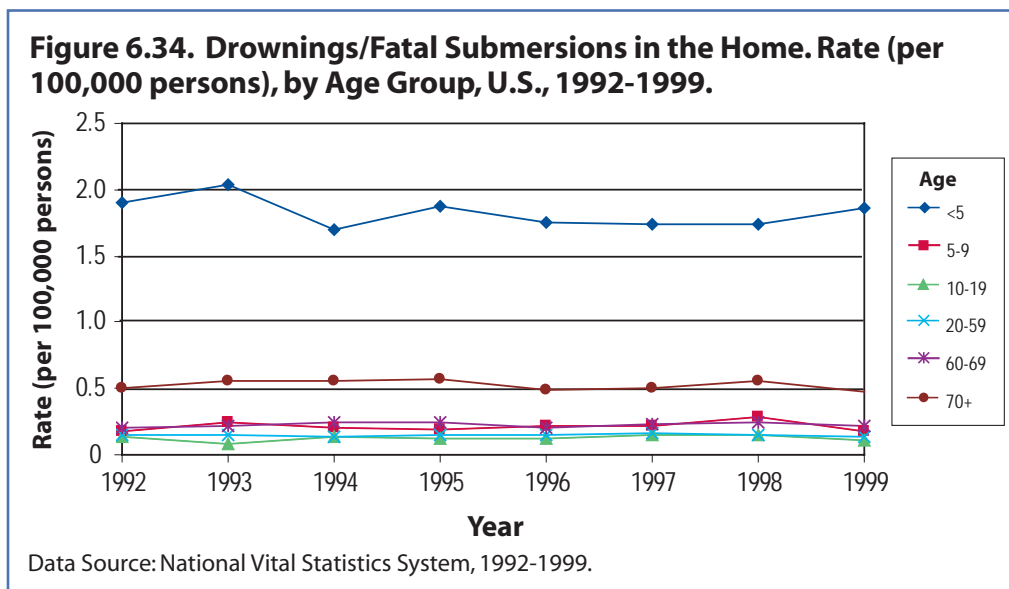
Nonfatal Injuries and Emergency Department Visits — The low number of near-drownings and missing data from both the National Health Interview Survey and National Hospital Ambulatory Medical Care Survey- Emergency Department prohibit the comparison of trends.

Chapter Summary

Describing the overall patterns in fatal and nonfatal home injury trends is difficult. Changes in data collection over time, changes in patterns of health care utilization, and demographic changes all interact and make the detection of clear trends problematic. It is clear, however, that the problem of home injuries has not diminished in recent years, relative to non-home unintentional injuries. In some cases, such as falls occurring in the home among older adults, home poisonings among children younger than 5, and home poisoning deaths among adult males, the data indicate possible rises in incidence in recent years.

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Chapter 7 -- Unintentional Home Injury Cost Trends

Burden of Home Injury to Society

Medically Treated Home Injuries

Unintentional injuries that occur in the home cost society at least $222 billion per year in medical costs, with an additional $165 billion in medical costs from injuries that possibly occur in the home **(Table 7.1)**. This totals $387 billion per year, which exceeds the medical costs for injuries resulting from motor vehicle crashes, acts of suicide, or violence. Overall, unintentional injuries in the home accounted for 19 to 33 percent of all injury costs in the five-year period between 1997 and 2001. Over this period, medical costs for home injuries decreased between 1997 and 1999 and started increasing in 2000.

Table 7.1. Cost of Injury by Cause and the Portion Resulting from Home Injury, U.S., 1997-2001 (inflation-adjusted to year 2000 dollars, in billions of dollars).

Cause	1997	1998	1999	2000	2001	Average across all years
Unintentional Definitely at Home	252	214	195	214	231	222
Unintentional Possibly at Home	211	165	126	137	187	165
Motor Vehicle	277	258	251	230	238	251
Suicide Acts	96	100	91	95	98	96
Violence	109	101	97	87	95	98
Other Unintentional	257	375	435	346	311	345
TOTAL ($, billions)	1,203	1,213	1,194	1,109	1,161	1,176

Data Sources: National Vital Statistics System; National Hospital Discharge Survey; National Health Interview Survey; National Electronic Injury Surveillance System - All Injury Program.

Quality-Adjusted Life Years Lost Due to Unintentional Home Injuries

Between 1997 and 2001, more than 1.7 million quality-adjusted life years were lost annually due to unintentional deaths and nonfatal injuries that occurred in the home **(Table 7.2)**. Quality-adjusted life years refer to the estimated number of years a person would have lived a healthy life had he or she not died or suffered a disability as a result of the home injury, in addition to the individual's quality of life following an injury.

The third largest age group dying from home injuries is children less than 1 year of age (refer to Chapter 1). Consider the potential years of healthy life that were lost due to the home injury death that occurred at the beginning of life.

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Table 7.2. Quality-Adjusted Life Years Lost Due to All Unintentional Home Injuries, U.S., 1997-2001 (in thousands of years).

	1997	1998	1999	2000	2001	Average across all years
Life Years Lost	2,060	1,708	1,521	1,739	1,846	1,775

Data Sources: National Vital Statistics System; National Hospital Discharge Survey; National Health Interview Survey; National Electronic Injury Surveillance System - All Injury Program.

Cost of Unintentional Home Injuries, by Cause

Falls by far cost society the most money in medical care, compared with medical costs from other causes of unintentional home injury. Falls cost $100 billion annually, followed by home injuries resulting from a person being stuck by or against an object, which cost $19 billion per year. Between 1997 and 2001, the annual cost of fall injuries represented 45 percent of the total costs for medically treated unintentional home injuries.

Table 7.3. Cost of All Unintentional Home Injuries, by Cause, U.S., 1997-2001 (inflation-adjusted to year 2000 dollars, in billions of dollars).

Cause	1997	1998	1999	2000	2001	Average across all years
Fall	132	97	82	80	112	100
Struck By/Against	18	16	26	19	16	19
Poisoning	14	15	17	24	22	18
Cut/Pierce	17	19	14	12	12	15
Overexertion	17	15	14	10	9	13
Bite/Sting	9	9	4	20	19	12
Fire/Burn	8	6	7	6	6	7
Bicycle/Tricycle	4	7	3	4	5	5
Non-Motor-Vehicle Transportation	1	2	4	11	6	5
Hot Object	4	5	3	4	2	4
Suffocation	4	4	2	3	4	3
Natural/Environmental	2	1	3	3	3	3
Caught in-between Objects	3	2	2	3	3	3
Appliances & Electrical Tools	4	4	3	3	1	3
Drowning/Submersion	2	2	2	2	2	2
Firearm	2	2	2	1	1	2
Foreign Body	5	1	2	2	3	2
Miscellaneous	2	2	2	3	1	2
Unspecified	3	1	2	2	2	2
Motor Vehicle	1	2	2	1	1	1
Electrocution	0	1	0	0	0	0
TOTAL ($, billions)	252	213	196	213	230	221

Data Sources: National Vital Statistics System; National Hospital Discharge Survey; National Health Interview Survey; National Electronic Injury Surveillance System - All Injury Program.

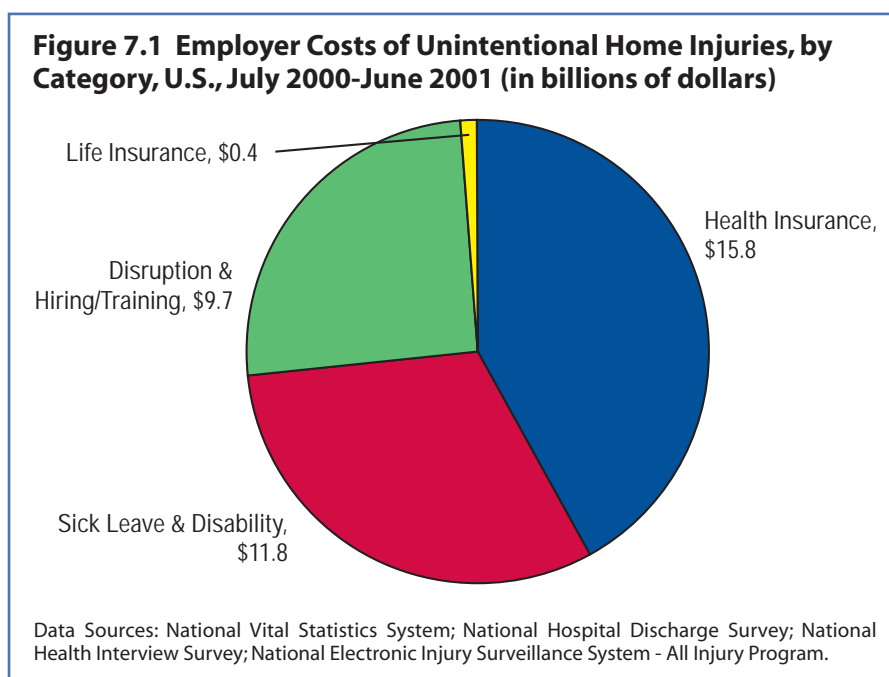**7**

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Burden of Home Injury to Employers

Recent publicity has focused on corporate layoffs as a cost-cutting tool. Debate has contrasted the "bottom line" with "corporate responsibility." Injuries account for a substantial portion of health-related costs. Cost-conscious employers can evaluate their potential fringe benefit savings from safety programs. This section shows that by reducing home injuries, the potential health care and other fringe benefit savings to employers are large.

Employer Costs of Unintentional Home Injuries, by Category

During the one-year period from July 2000 to June 2001, unintentional home injuries cost employers almost $38 billion. As **Figure 7.1** indicates, employer health care (medical) spending on home injuries was $15.8 billion. Another $11.8 billion was spent on sick leave and disability insurance for those injured at home. Disruption caused by the injuries and efforts for training/retraining or hiring new employees cost employers another $9.7 billion, and life insurance payments cost employers another $400 million. Overall, employer costs of home injury total $281 per employee annually.

Figure 7.1 Employer Costs of Unintentional Home Injuries, by Category, U.S., July 2000-June 2001 (in billions of dollars)

Life Insurance, $0.4

Health Insurance, $15.8

Disruption & Hiring/Training, $9.7

Sick Leave & Disability, $11.8

Data Sources: National Vital Statistics System; National Hospital Discharge Survey; National Health Interview Survey; National Electronic Injury Surveillance System - All Injury Program.

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Employer Costs of Unintentional Home Injuries, by Severity

Between July 2000 and June 2001, employer costs per home-injured person increased as the severity of the injury increased **(Table 7.4)**. An employee or dependent injured at home cost an employer $765 on average if the injured person was not hospitalized. A hospitalized injury cost an employer almost $20,000 and a fatality almost $30,000. These costs can have a great impact on small businesses, potentially leading to the closure of many that are already financially constrained.

Table 7.4. Employer Costs per Unintentionally Home Injured Person, by Injury Severity and Cost Category, U.S., July 2000-June 2001.

Cost Category	Non-Hospitalized Survivor	Hospitalized Survivor	Fatal Injury
Health Insurance	264	11,044	4,136
Sick Leave & Disability	220	7,279	0
Disruption & Hiring/Training	281	1,256	6,745
Life Insurance	0	0	19,045
TOTAL ($)	765	19,579	29,927

Data Sources: National Vital Statistics System; National Electronic Injury Surveillance System - All Injury Program.

In total, nonfatal home injuries that did not result in hospitalization cost employers $23.8 billion between July 2000 and June 2001, and those that resulted in hospitalization cost employers $13.4 billion **(Figure 7.2)**. In the same year, fatal injuries that occurred at home cost employers more than $500 million.

Figure 7.2. Employer Costs of Unintentional Home Injuries, by Injury Severity, U.S., July 2000-June 2001 (in billions of dollars).
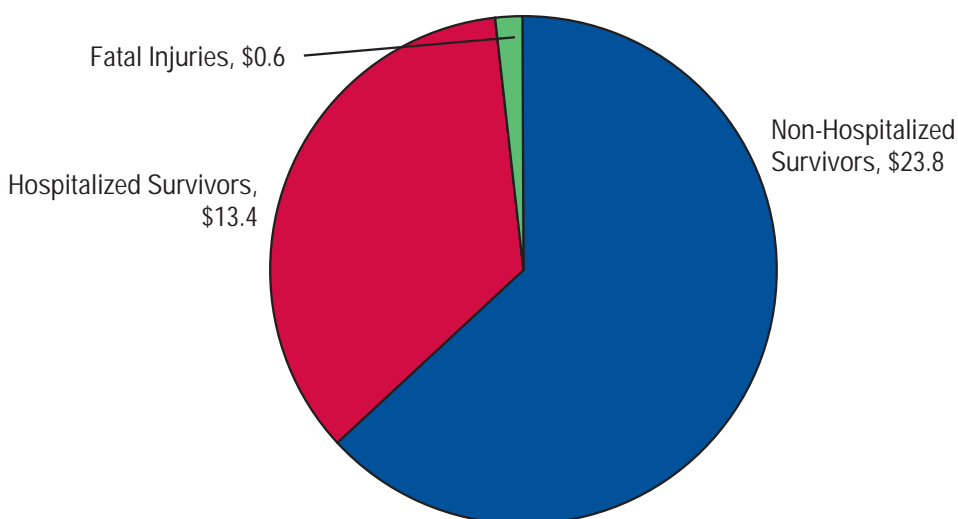
Fatal Injuries, $0.6
Hospitalized Survivors, $13.4
Non-Hospitalized Survivors, $23.8

Data Sources: National Vital Statistics System; National Electronic Injury Surveillance System - All Injury Program.

Employer Costs of Unintentional Home Injuries, by Cause of Injury

Forty-three percent of employer costs of unintentional home injury come from falls **(Table 7.5)**. Safety programs aimed at reducing falls in the home can reap sizeable benefits for employers.

Table 7.5 Employer Costs of Unintentional Home Injuries, by Cause of Injury, U.S., July 2000-June 2001 (in billions of dollars).

Cause	Total Cost	Percentage
Fall	16.4	43
Struck By/Against	4.8	13
Overexertion	3.9	10
Cut/Pierce	2.3	6
Bite/Sting	2.0	5
Poisoning	1.7	5
Foreign Body	1.3	4
Fire/Burn	1.1	3
Unspecified	1.0	3
Cyclist/Pedestrian	0.6	2
Miscellaneous	0.7	2
Motor Vehicle	0.3	1
Other Transportation	0.5	1
Suffocation	0.3	1
Appliances & Electrical Tools	0.3	1
Drowning/Submersion	0.2	1
Firearms	0.2	0
Natural/Environmental	0.1	0
TOTAL	$37.7	100

Data Sources: National Vital Statistics System; National Electronic Injury Surveillance System - All Injury Program.

Safety Programs Can Produce Savings

In balancing the goals of competitiveness and goodwill to employees, alternative strategies to cost-cutting become attractive. Employer health care (medical) spending for unintentional home injuries was $15.8 billion in the one-year period between July 2000 and June 2001. Another $12.2 billion was spent on sick leave and life and disability insurance for unintentional home injuries. Safety programs are an alternative to reduce these costs without reducing the benefits offered to employees. Protecting employees from home injury can be a beneficial investment of time and resources.

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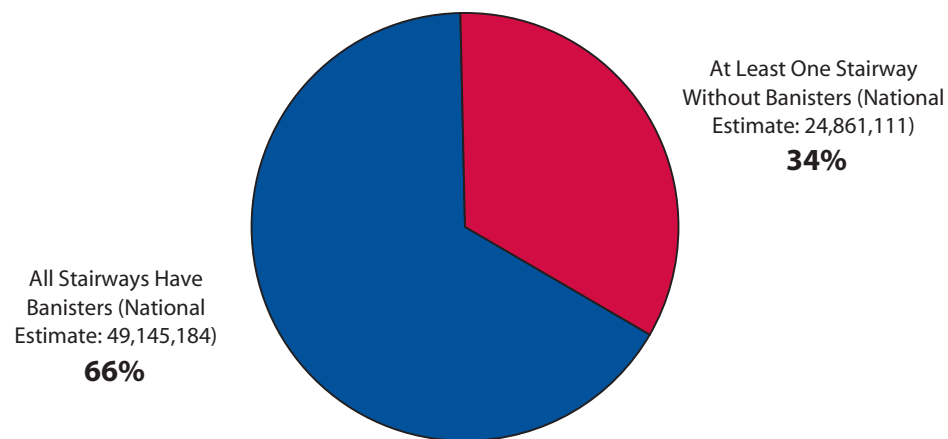# Chapter 8 -- The State of Home Safety in America - 2002 Survey

This chapter presents results from a telephone survey of 1,003 households in 48 states and Washington, D.C., conducted in the spring of 2002. The purpose of the survey was to collect information about home safety issues and the use of home safety devices for the three leading causes of unintentional home injury death in the United States — falls, poisonings and fires/burns. It also examined firearm storage practices and safety behaviors. This chapter is reprinted from *The State of Home Safety in America (2002),* where more details about the study methods are described.

Falls

Stairways & Ladders

About 20 percent of fatal falls that happen in a home environment involve steps, stairways or ladders. When asked, 56 percent of respondents said that their household contains an indoor stairway with four or more steps, and more than one-quarter (28%) reported having such a stairway on the outside of the home. Of those homes with stairs either inside, outside or both, 34 percent did not have banisters or handrails by the stairway **(Figure 8.1)**. Stairways without handrails or banisters were present in 30 percent of homes with adults 70 or older and in 43 percent of the households in which children 6 or younger live **(Figure 8.2)**.

Figure 8.1. Percentage and National Estimate of Stairways Without Banisters/Handrails in U.S. Households, 2002.

At Least One Stairway Without Banisters (National Estimate: 24,861,111)
34%

All Stairways Have Banisters (National Estimate: 49,145,184)
66%

Note: Responses represent those respondent-households with at least four steps either inside and/or outside of the home. Population estimate is 74,058,974.

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Figure 8.2. Prevalence of Stairways Without Banisters/ Handrails in U.S. Households, by Presence of Young Children and Older Adults Living in the Home, 2002.
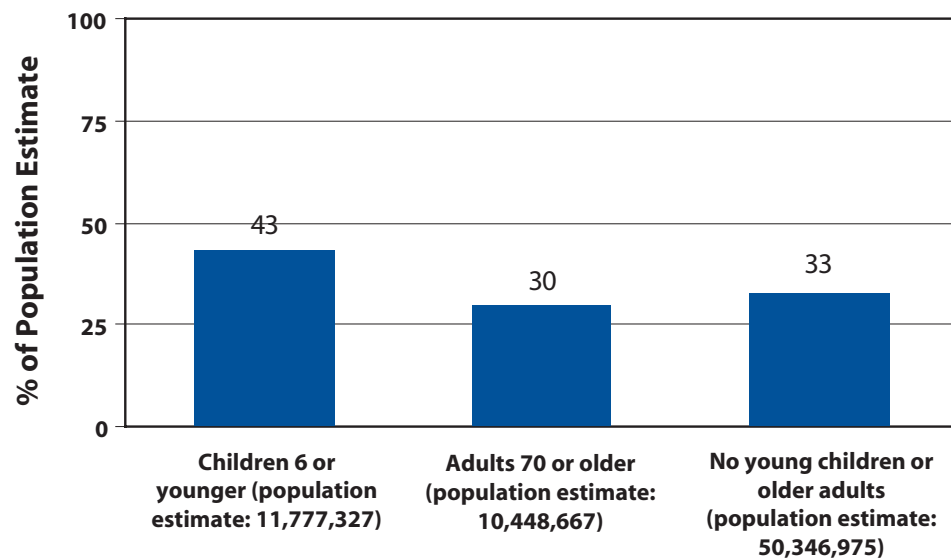
Note: Responses represent those respondent-households with at least four steps either inside and/or outside of the home. Households with persons in multiple or unknown age groups are excluded.

Sixty percent of those interviewed reported that someone in the household uses a ladder with at least four or more steps, or one that is at least four feet high. Reported ladder use was higher among those in owner-occupied homes (74%), compared to those in renter-occupied homes (28%).

Window Devices

Among those whose homes had windows at a second floor level or above, only one-quarter reported that window safety devices, such as window locks or safety guards, were installed. Among those households in which young children live or visit, 73 percent of those with windows at a second-floor level or above reported that no safety devices were installed on the windows.
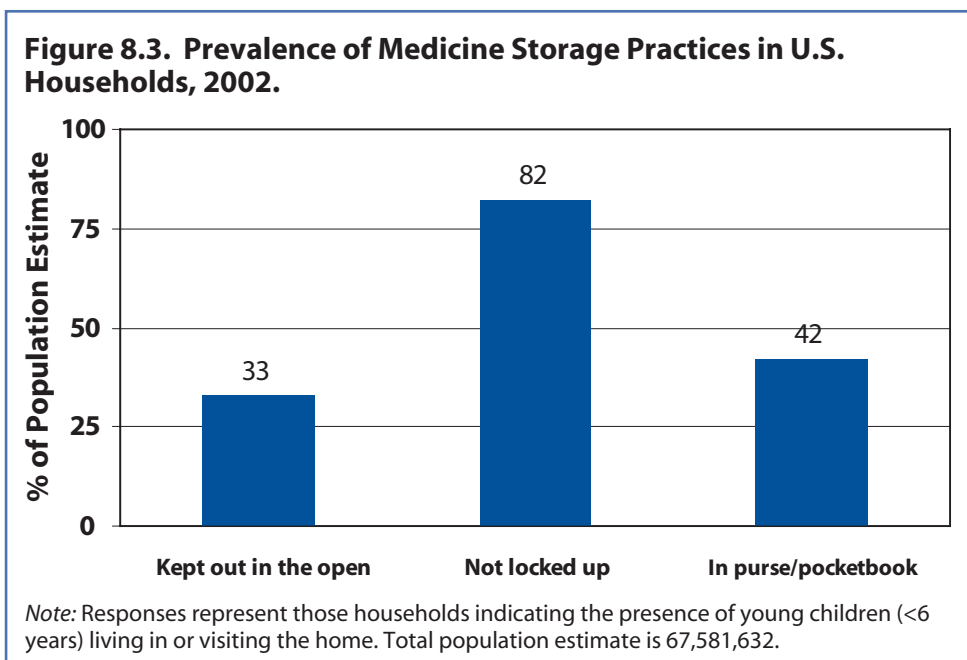
Bathroom Safety

Grab bars and non-skid mats are designed to prevent falls in the bathroom. Seventy percent of respondents indicated that there were either grab bars or non-skid mats in their household bathrooms. Twenty-five percent had grab bars installed, and 63 percent had non-skid mats. The figures are higher among those households with an adult 70 years or older, in which 45 percent had grab bars installed and 79 percent had non-skid mats.
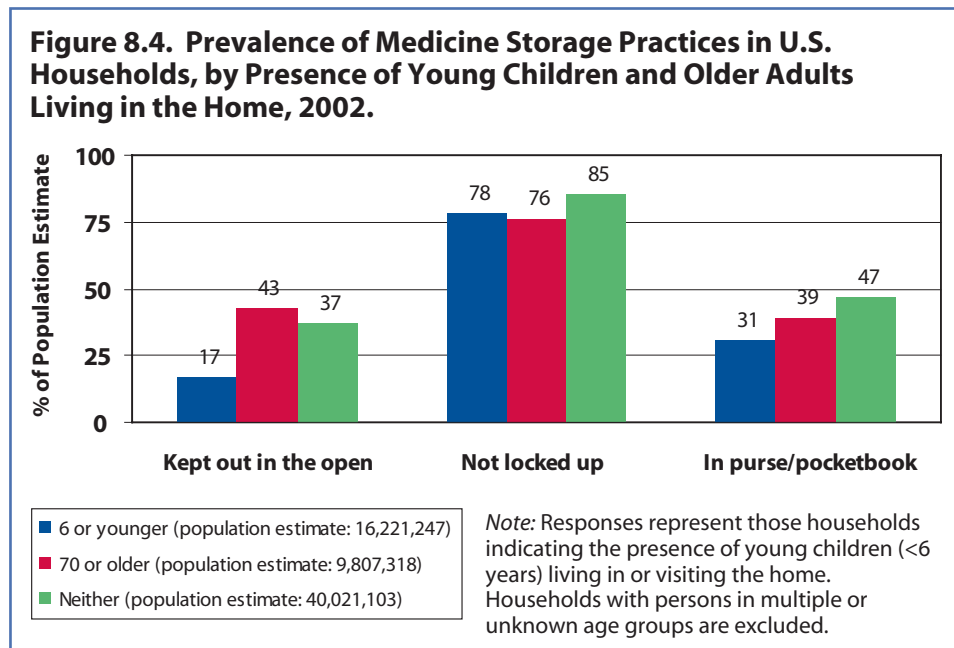
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Poisonings

Medicines and Chemicals

In those homes in which children younger than 6 live or visit at least once a year, the proportion of ever keeping medicines in an unsecured location, such as on a table, shelf or countertop, was 33 percent, while 82 percent reported keeping medicines in an unlocked drawer or cabinet, and 42 percent reported keeping medicines in a purse **(Figure 8.3)**.
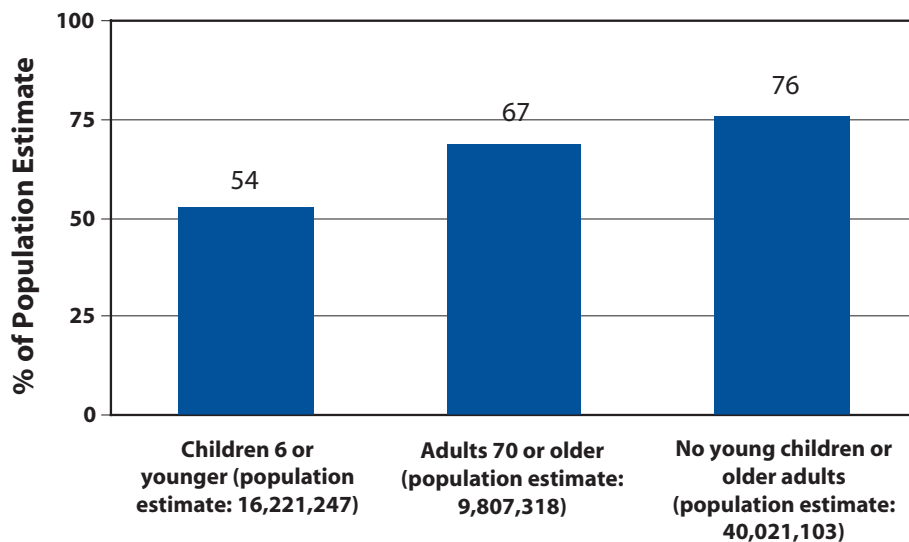
Figure 8.3. Prevalence of Medicine Storage Practices in U.S. Households, 2002.

Note: Responses represent those households indicating the presence of young children (<6 years) living in or visiting the home. Total population estimate is 67,581,632.

Respondents in homes inhabited by young children were less likely to report storing medicines in open areas such as tabletops or countertops (17%), compared to respondents in homes inhabited by persons age 70 or older, but where children visit (43%) **(Figure 8.4)**. A large percentage of homes with adults 70 and older (76%) and those where young children live (78%) reported keeping medicines in unlocked cabinets or drawers.

Figure 8.4. Prevalence of Medicine Storage Practices in U.S. Households, by Presence of Young Children and Older Adults Living in the Home, 2002.

- 6 or younger (population estimate: 16,221,247)
- 70 or older (population estimate: 9,807,318)
- Neither (population estimate: 40,021,103)

Note: Responses represent those households indicating the presence of young children (<6 years) living in or visiting the home. Households with persons in multiple or unknown age groups are excluded.

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More than one-half (54%) of homes with children younger than 6 living there reported that household chemicals like cleaners, bleach or kerosene are never stored in locked places **(Figure 8.5)**. Among those households (n = 350) reporting that they keep chemicals used in a shop or garden – like turpentine, fertilizer or pesticides – 59 percent reported that they store them in unlocked places that a 5 year old might be able to open **(Figure 8.6)**, even if it meant they might have to climb up on something to reach it. In addition, shop and garden chemicals are not kept locked in 57 percent of the households where children younger than 6 live **(Figure 8.7)**.

Figure 8.5. Prevalence of U.S. Households in Which Household Chemicals are Not Locked Up, by Presence of Young Children and Older Adults Living in the Home, 2002.

Note: Responses represent those households indicating the presence of young children (<6 years) living in or visiting the home. Households with persons in multiple or unknown age groups are excluded.

Figure 8.6. Prevalence of Storage Practices of Chemicals in U.S. Households, by Type of Chemical, 2002.
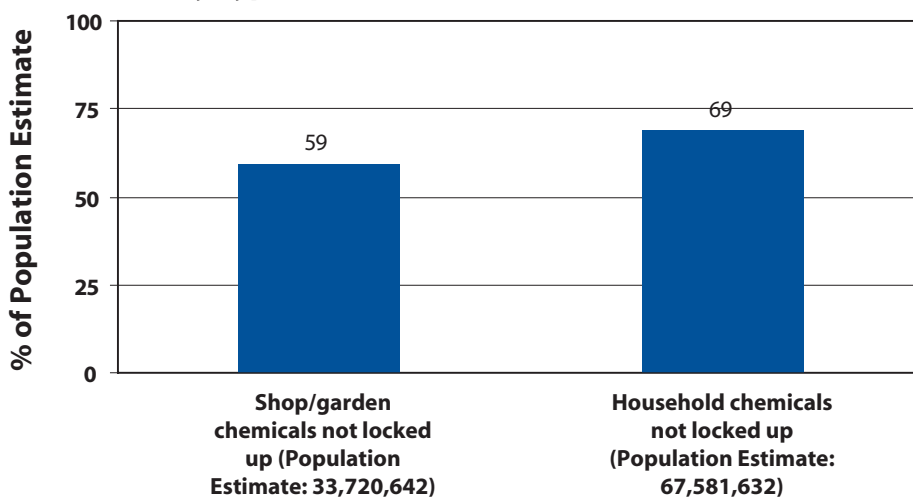
Note: Responses represent those households indicating the presence of young children (<6 years) living in or visiting the home. Responses for "Shop/garden chemicals in unlocked place" represent households with shop or garden chemicals stored at home.

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Figure 8.7. Prevalence of U.S. Households in Which Shop/Garden Chemicals are Stored Unlocked, by Presence of Young Children and Older Adults Living in the Home, 2002.
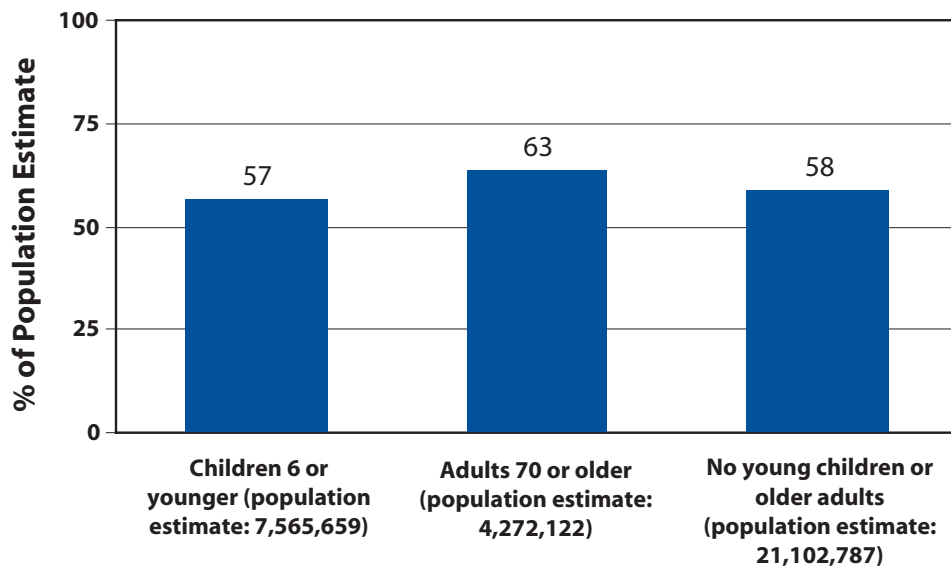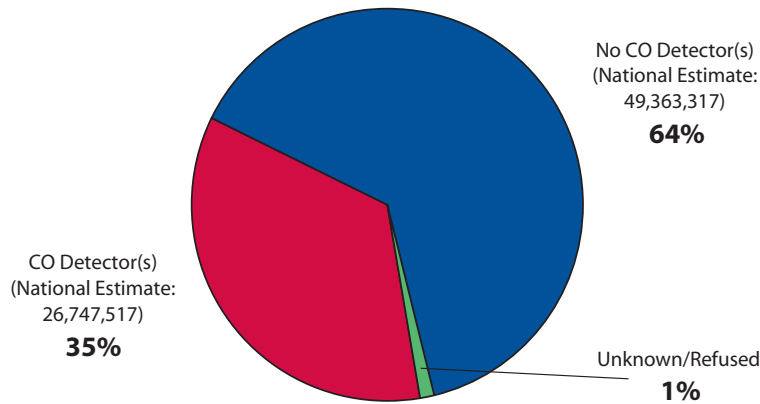

Note: Responses represent those households indicating the presence of young children (<6 years) living in or visiting the home, with shop or garden chemicals stored at home. Households with persons in multiple or unknown age groups are excluded.

Carbon Monoxide (CO)

About 5 percent of all unintentional home poisoning deaths are caused by carbon monoxide not associated with a residential fire. Carbon monoxide can be emitted by burning of wood, kerosene or coal, as well as by sources of gas or motor vehicles. Slightly less than one-third (31%) of households used fireplaces or wood stoves. The largest proportions of fireplace users were in freestanding houses rather than other types of structures and were located in the Western part of the United States. Kerosene heater use was reported by only 3 percent of the respondents, with highest usage among manufactured home dwellers. Approximately two-thirds (67%) of respondents used gas, wood, kerosene, coal, or fuel oil as their major household heating source, and 51 percent of homes had gas appliances of some sort. However, fewer than one-third (29%) of all homes overall reported having a carbon monoxide detector.

Even though children and older adults are the most susceptible to carbon monoxide poisoning, the prevalence of carbon monoxide detectors in homes with children younger than 7 living there (30%) was about the same as the general population. The prevalence of carbon monoxide detectors in homes with adults 70 and older (28%) was also similar to the national percentage. Those respondents who used gas, wood, kerosene, coal or fuel oil as their primary household heating source, or whose homes had gas appliances of some sort, were slightly more likely to have a carbon monoxide detector (35%) than the overall average **(Figure 8.8)**.
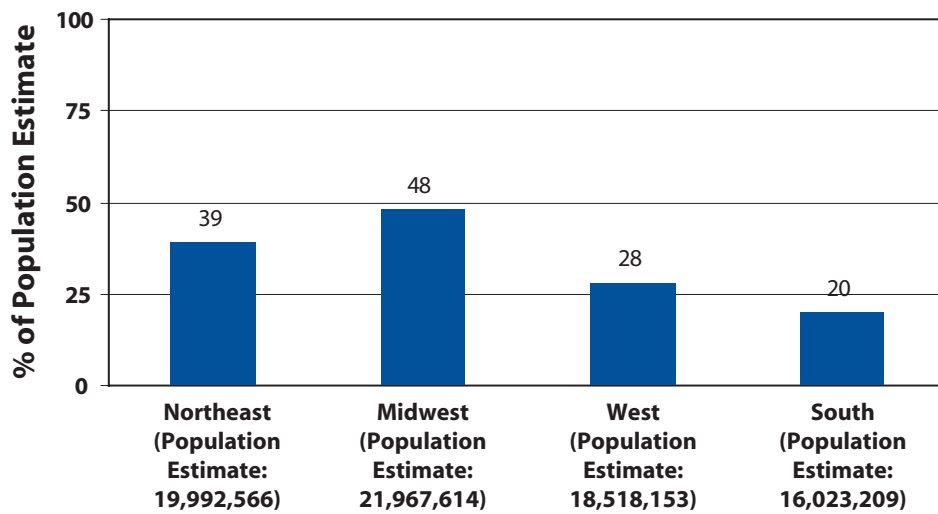
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Figure 8.8. Percentage and National Estimate of Carbon Monoxide Detectors in U.S. Households, 2002.

No CO Detector(s)
(National Estimate:
49,363,317)
64%

CO Detector(s)
(National Estimate:
26,747,517)
35%

Unknown/Refused
1%

Note: Responses represent those households in which gas, wood, kerosene, coal or fuel oil is used as a primary heating source, and/or those that contain gas appliances. Population estimate is 76,501,542.
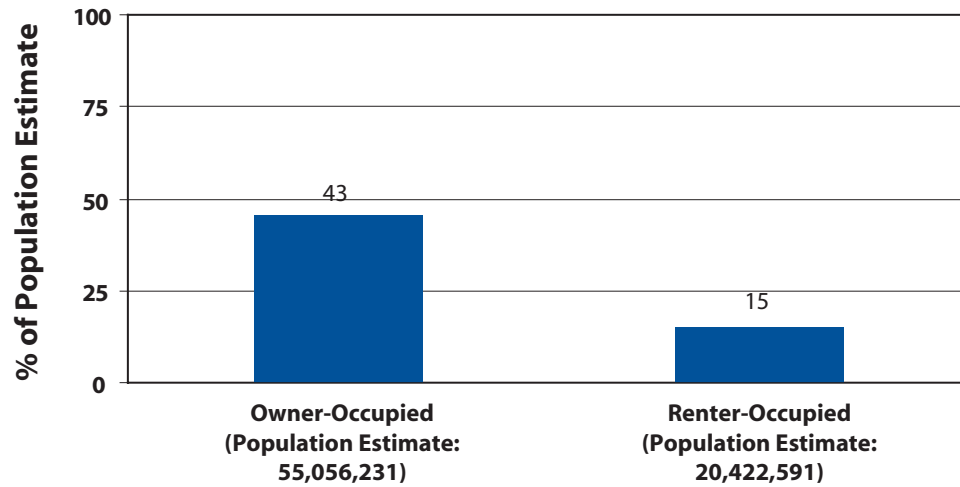
Among those households using gas, wood, kerosene, coal or fuel oil for heating or containing gas appliances, those in the South (20%) and West (28%) were less likely to have a carbon monoxide detector than those in the Northeast (39%) and Midwest (48%) **(Figure 8.9)**. Additionally, renter-occupied homes were substantially less likely to have a carbon monoxide detector compared to owner-occupied homes (15% vs. 43%) **(Figure 8.10)**.

Figure 8.9. Prevalence of Carbon Monoxide Detectors in U.S. Households, by Region, 2002.

% of Population Estimate

|	
Northeast (Population Estimate: 19,992,566)	39
Midwest (Population Estimate: 21,967,614)	48
West (Population Estimate: 18,518,153)	28
South (Population Estimate: 16,023,209)	20

Note: Responses represent those households in which gas, wood, kerosene, coal or fuel oil is used as a primary heating source, and/or those that contain gas appliances. Unknown/refused responses are excluded.

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Figure 8.10. Prevalence of Carbon Monoxide Detectors in U.S. Households, by Whether Home is Renter- or Owner-Occupied, 2002.

Note: Responses represent those households in which gas, wood, kerosene, coal or fuel oil is used as a primary heating source, and/or those that contain gas appliances.

Fires, Burns and Scalds

Smoke Alarms

Almost all (97%) respondents said there were smoke alarms installed in their homes. Households with smoke alarms contain a variety of types: 65 percent of homes had battery-operated alarms only, 25 percent had electric smoke alarms only, and 8 percent used more than one type of alarm **(Figure 8.11)**. Eighty percent of respondents reported that there was at least one smoke alarm on each level of the home **(Figure 8.12)**. The presence of smoke alarms on each level was more common in renter-occupied homes (86%) than owner-occupied homes (77%) **(Figure 8.13)**.

Figure 8.11. Percentage and National Estimate of Types of Smoke Alarms in U.S. Households, 2002.
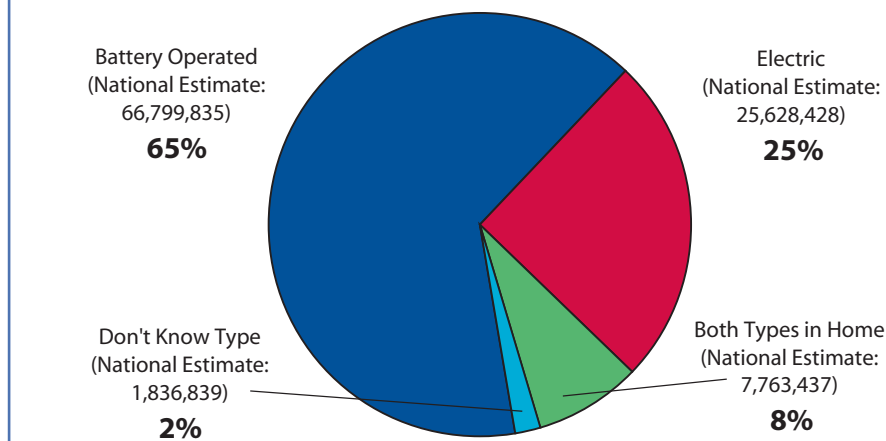

Note: Population estimate is 102,008,539.

Figure 8.12. Percentage and National Estimate of U.S. Households with at Least One Smoke Alarm on Each Level, 2002.
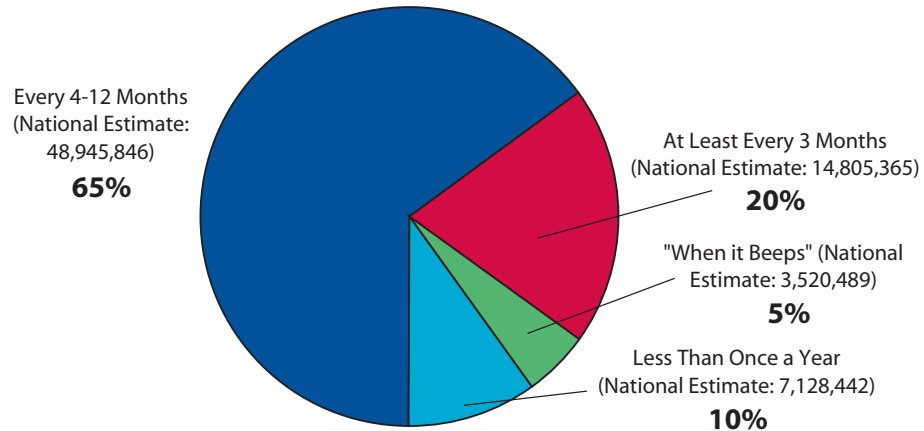
Smoke Alarm(s)
on Each Level
(National Estimate:
84,618,260)
80%

No Smoke Alarms
on Some Level(s)
(National Estimate:
20,513,005)
19%

Don't Know
1%
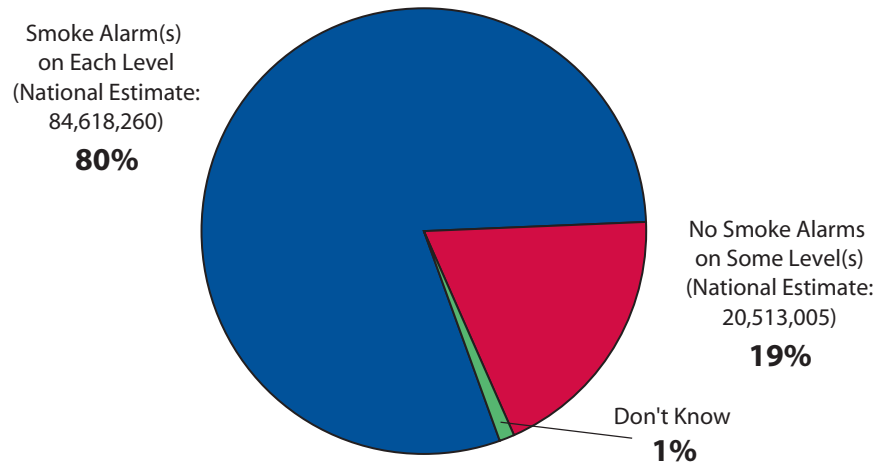
Note: Population estimate is 105,810,000.

Figure 8.13. Prevalence of U.S. Households with at Least One Smoke Alarm on Each Level, by Whether Home is Renter- or Owner-Occupied, 2002.

% of Population Estimate

Owner-Occupied
(Population Estimate:
72,061,509) — 77

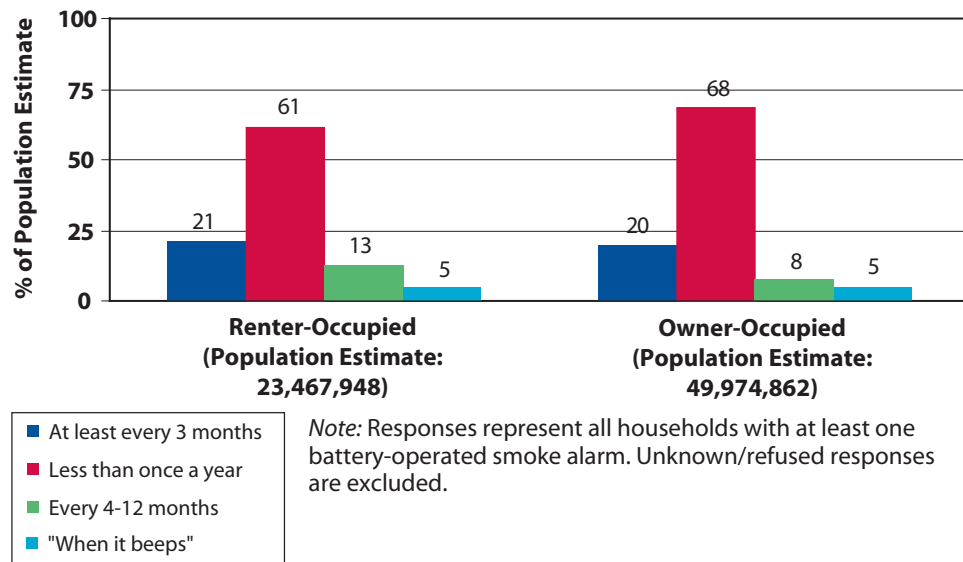Renter-Occupied
(Population Estimate:
32,444,921) — 86

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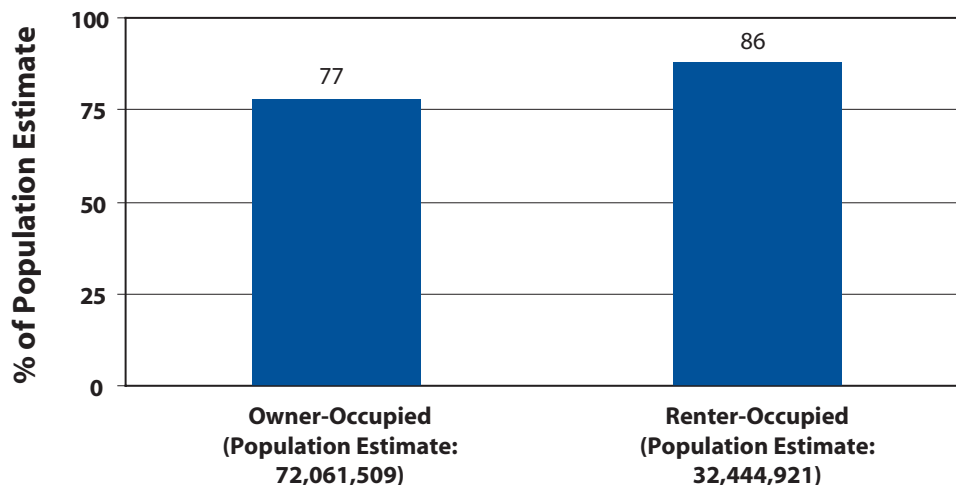
Testing of smoke alarms was reported by 89 percent of all applicable households, but only 20 percent of respondents said the alarms in their homes were tested at least quarterly (every three months) **(Figure 8.14)**. Renter- and owner-occupied households had similar percentages in the frequency of when smoke alarms were tested **(Figure 8.15)**. In households with battery-operated smoke alarms, only 20 percent said the alarms in their homes were tested at least quarterly.

Figure 8.14. Percentage and National Estimate of the Frequency of Testing Smoke Alarms in U.S. Households, 2002.
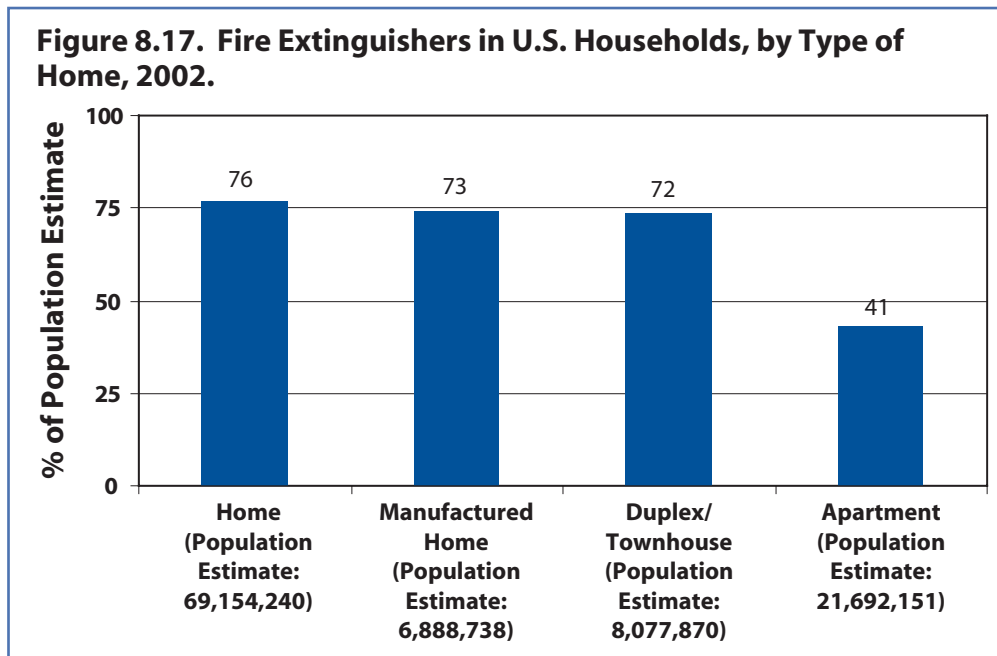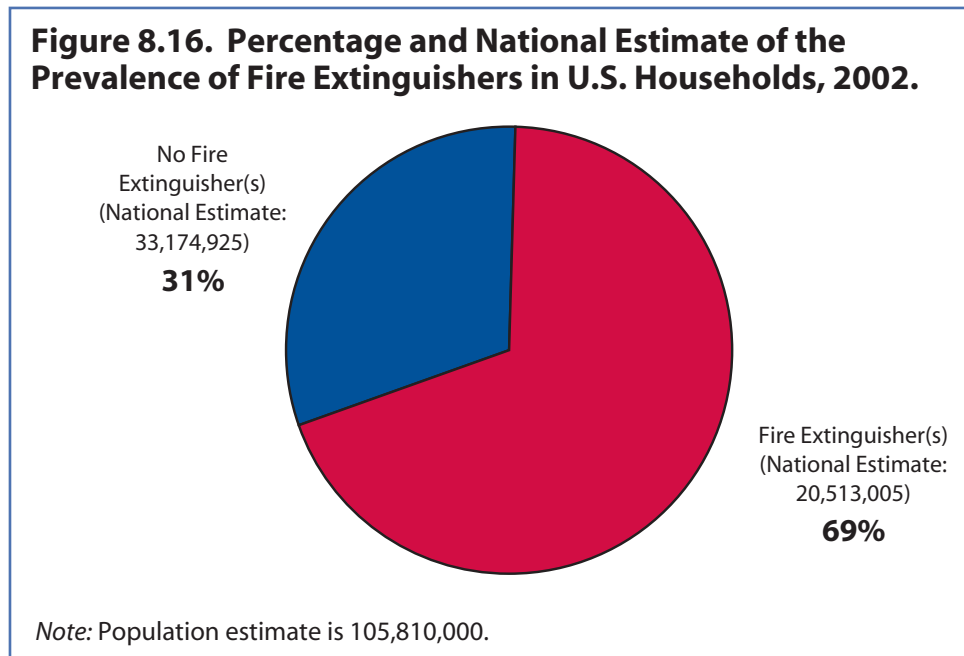

Every 4-12 Months
(National Estimate:
48,945,846)
65%

At Least Every 3 Months
(National Estimate: 14,805,365)
20%

"When it Beeps" (National
Estimate: 3,520,489)
5%

Less Than Once a Year
(National Estimate: 7,128,442)
10%

Note: Responses represent all households with at least one battery-operated smoke alarm. Population estimate is 74,543,273.

Figure 8.15. Frequency of Testing Smoke Alarms in U.S. Households, by Whether Home is Renter- or Owner-Occupied, 2002.
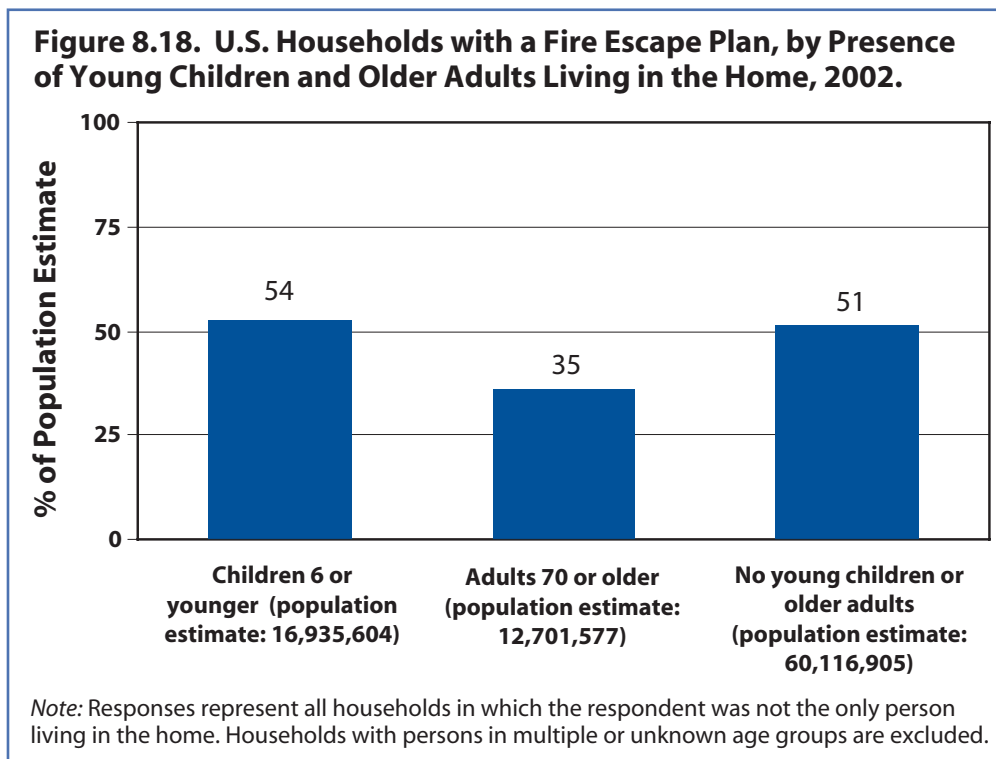

% of Population Estimate

Renter-Occupied
(Population Estimate:
23,467,948)

Owner-Occupied
(Population Estimate:
49,974,862)

- At least every 3 months
- Less than once a year
- Every 4-12 months
- "When it beeps"

Note: Responses represent all households with at least one battery-operated smoke alarm. Unknown/refused responses are excluded.

8

Fire Extinguishers

More than two-thirds of the households (69%) reported having fire extinguishers **(Figure 8.16)**, with the lowest proportion among those residing in apartments (41%), compared to houses (76%) and manufactured homes (73%) **(Figure 8.17)**.

Figure 8.16. Percentage and National Estimate of the Prevalence of Fire Extinguishers in U.S. Households, 2002.

No Fire Extinguisher(s) (National Estimate: 33,174,925) **31%**

Fire Extinguisher(s) (National Estimate: 20,513,005) **69%**

Note: Population estimate is 105,810,000.

Figure 8.17. Fire Extinguishers in U.S. Households, by Type of Home, 2002.

% of Population Estimate

Home (Population Estimate: 69,154,240)	Manufactured Home (Population Estimate: 6,888,738)	Duplex/ Townhouse (Population Estimate: 8,077,870)	Apartment (Population Estimate: 21,692,151)
76	73	72	41

8

Fire Escape Planning

Forty-nine percent of the respondents who had more than one person living in the home reported having discussed a fire escape plan. Fifty-four percent of households with young children reported having discussed an escape plan, compared to 35 percent of households containing persons 70 or older **(Figure 8.18)**. Respondents living in apartments were the least likely to report that they had a fire escape plan (32%), compared to those living in houses (55%), manufactured homes (49%), or either duplexes or townhouses (39%).

Figure 8.18. U.S. Households with a Fire Escape Plan, by Presence of Young Children and Older Adults Living in the Home, 2002.

Note: Responses represent all households in which the respondent was not the only person living in the home. Households with persons in multiple or unknown age groups are excluded.

Scalds

Seventy-five percent of respondents indicated that they did not know the temperature of the setting on their hot water heaters, and 91 percent were unaware of the temperature of water at the tap. In homes with those most vulnerable to scald burns (young children and older adults), the percentages of those unaware of the hot water heater setting were 82 percent in homes with young children and 77 percent in homes with older adults. Almost no one could report the temperature of the water at the tap, with 93 percent of homes with young children and 91 percent of those with older adults reporting they did not know the temperature.

8

Firearm Storage Practices

Among respondents whose households contained at least one firearm (31 percent of all households and 33 percent of those where children younger than six live or visit) **(Figure 8.19)**, nearly one-half (46%) reported that all guns were kept locked up, and 28 percent reported use of gun locks. Forty-nine percent of respondents in homes in which young children live or visit reported keeping all guns locked up, and 32 percent reported using gun locks.

Figure 8.19. Percentage and National Estimate of Firearms in U.S. Households, 2002.

No Firearm(s)
(National Estimate:
69,839,914)
66%

Don't Know/Refused
3%

Firearm(s)
(National Estimate:
33,034,285)
31%

Note: Population estimate is 105,810,000.
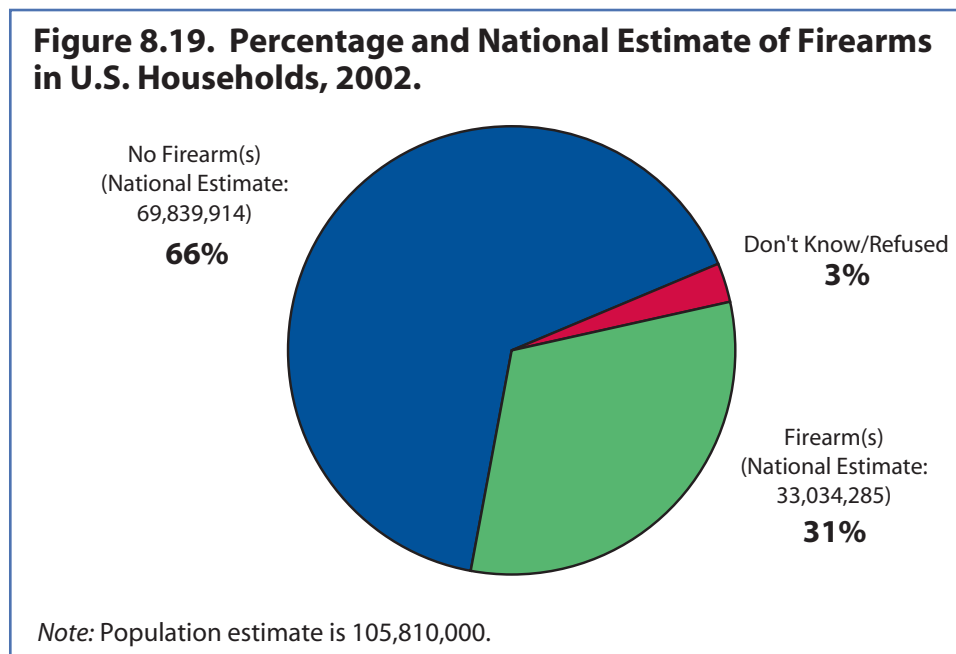
Activities to Improve Home Safety

When we asked, "What one thing, if anything, would you *most* like to do in the next year to prevent unintentional injuries in your home?", 44 percent of the respondents specified a particular safety practice, 33 percent could not think of anything they would change, and 22 percent said they would do nothing **(Table 8.1)**. Of those who identified something they would like to change, 39 percent named something related to fall prevention, while 23 percent said they would like to do something related to fire prevention. Other activities mentioned were associated with electrical safety, protection from violence or intruders, prevention of carbon monoxide poisoning, or an assortment of other issues (e.g., drowning and poisoning prevention, safety for babies, and sports safety). Of all households, fall prevention was more often mentioned as a desired change by respondents who said that someone had fallen in their home in the last year, compared to respondents where no one had experienced a fall.

8

Table 8.1. Desired Safety Practices to Improve Safety at Respondent's Home in the Next Year.

Desired Safety Practice Related to Preventing ...	Percent of Total	National Estimate
Falls	39	18,268,218
Fires/Burns	23	10,877,945
Injuries in General	5	2,353,827
Electrical Injuries	5	2,263,408
Violence or Burglary	4	2,111,528
Carbon Monoxide Poisoning	3	1,445,823
Drownings/Submersions	2	*
Poisonings	2	*
Injuries to Babies	1	*
Recreational & Sporting Activities	<1	*
All Else	15	7,150,490
TOTAL	100	46,959,239

NOTE: Data represent those households in which the respondent indicated something she/he would like to do for home safety. Missing data (noted with asterisks above) indicate that a reliable national estimate could not be generated.

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8

References

A.M. Best and Co. Best aggregates and averages. Oldwick, NJ: A.M. Best and Co., 1996.

American Academy of Pediatrics. Drowning in infants, children and adolescents (RE9319). Pediatrics 1993;92(2):292-294.

Bar-on ME, Boyle RM, Endriss EK. Parental decisions to use infant walkers. Injury Prevention 1998;4(4):299-301.

Bass JK, Ortega L, Rosales C, Petersen NJ, Philen RM. What's being used at home: a household pesticide survey. Pan American Journal of Public Health 2001;9(3):138-144.

Baum CR, Shannon MW. The lead concentration of reconstituted infant formula. Clinical Toxicology 1997;35(4):371-375.

Berkowitz M, Harvey C, Greene CG, Wilson SE. The economic consequences of spinal cord injury. Washington, DC: Paralysis Society of America of the Paralyzed Veterans of America, 1990.

Binder S, Matte TD, Kresnow M, Houston B, Sacks JJ. Lead testing of children and homes: results of a national telephone survey. Public Health Reports 1996;111(4):342-346.

Binns HJ, LeBailly SA, Fingar AR, Saunders S. Evaluation of risk assessment questions used to target blood lead screening in Illinois. Pediatrics 1999;103(1):100-106.

Binns HJ, LeBailly SA, Poncher J, Kinsella R, Saunders SE. Is there lead in the suburbs? Risk assessment in Chicago suburban pediatric practices. Pediatrics 1994;93(2):164-171.

Blum C, Shield J. Toddler drowning in domestic swimming pools. Injury Prevention 2000;6(4):288-290.

Bolen JC, Sacks JJ, Bland SD. Injury prevention behaviors: a report card for the nation, 1995. Preventive Medicine 1999;29(3):195-201.

Branscome JM, Crimmel BL. Changes in job related health insurance, 1996-1999. Rockville, MD: Agency for Healthcare Research and Quality. MEPS Chartbook No. 10, AHRQ Publication No. 02-0030, 2002.

Chatterjee BF, Imm P. Firearm prevalence and storage practices in Wisconsin households. Wisconsin Medical Journal 1996:95(5):286-291.

Clarke A, Walton WW. Effect of safety packaging on aspirin ingestion by children. Pediatrics 1979;63(5):687-693.

Coffman S, Martin V, Prill N, Langly B. Perceptions, safety behaviors, and learning needs of parents of children brought to an emergency department. Journal of Emergency Nursing 1998; 24(2):133-139.

Cohen MA, Miller TR. The cost of mental heath care for victims of crime. Journal of Interpersonal Violence 1998;13(1):93-110.

Coury DL, Kasten EF, Shepherd L, Mirvis B. The Columbus PROBE Group: Infant walker use in private practice populations. American Journal of Diseases of Children 1992; 146:507.

Dalton MA, Sargent JD, Stukel TA. Utility of a risk assessment questionnaire in identifying children with lead exposure. Archives of Pediatric and Adolescent Medicine 1996;150(2):197-202.

DiLillo D, Damashek D, Peterson L. Maternal use of baby walkers with young children: recent trends and possible alternatives. Injury Prevention 2001;7(3):223-227.

Douglas MR, Mallonee S, Istre GR. Estimating the prevalence of homes with functioning smoke alarms: a comparison of telephone surveys and household survey results. American Journal of Public Health 1999;89(7):1112-1114.

Drongowski RA, Smith SJ, Coran AG, Cullen ML. Firearm ownership in households with children. Journal of Pediatric Surgery 1998;33(4):589-593.

Expectancy Data. The dollar value of the day- 1998 dollar valuation. Expectancy Data, Shawnee Mission, KS, 2000.

Farah MM, Simon HK, Kellermann AL. Firearms in the home: parental perceptions. Pediatrics 1999;104(5):1059-1063.

Forjuoh SN, Cohen JH, Dearwater SR. Firearm ownership and storage practices in Pennsylvania homes. Injury Prevention 1996;2(4):278-282.

France EK, Gitterman BA, Melinkovich P, Wright RA. The accuracy of a lead questionnaire in predicting elevated pediatric blood lead levels. Archives of Pediatric and Adolescent Medicine 1996;150(9):958-963.

Gielen AC, Wilson ME, Faden RR, Wissow L, Harvilchuck JD. In-home injury prevention practices for infants and toddlers: the role of parental beliefs, barriers, and housing Quality. Health Education Quarterly 1995;22(1):85-95.

Gielen AC, Wilson ME, McDonald EM, Serwint JR, Andrews JS, Hwang WT, Wang MC. Randomized trial of enhanced anticipatory guidance for injury prevention. Archives of Pediatric and Adolescent Medicine 2001;155(1):42-49.

Gill TM, Williams CS, Robison JT, Tinetti ME. A population-based study of environmental hazards in the homes of older persons. American Journal of Public Health 1999;89(4):553-556.

Gillespie LD, Gillespie WJ, Robertson MC, Lamb SE, Cumming RG, Rowe BH. Interventions for preventing falls in elderly people. Cochrane Database Systematic Reviews 2003;(4):CD000340.

Gold MR, Siegel JE, Russell LB, Weinstein MC (Eds.). Cost-Effectiveness in Health and Medicine. New York, NY: Oxford University Press, 1996.

Goldberg BW, von Borstel ER, Dennis LK, Wall E. Firearm injury risk among primary care patients. The Journal of Family Practice 1995;41(2):158-162.

Gotsch K, Annest JL, Holmgreen P. Nonfatal choking-related episodes among children- United States, 2001. Morbidity and Mortality Weekly Report 2002;51(42):945-948.

Haan MN, Gerson M, Zishka BA. Identification of children at risk for lead poisoning: an evaluation of routine pediatric blood lead screening in an HMO-insured population. Pediatrics 1996;97(1):79-83.

Harvey PA, Sacks JJ, Ryan GW, Bender PF. Residential smoke alarms and fire escape plans. Public Health Reports 1998;113(5):459-464.

Haught K, Grossman D, Connell F. Parents' attitudes toward firearm injury prevention counseling in urban pediatric clinics. Pediatrics 1995;96(4):649-653.

Hemenway D, Richardson E. Characteristics of automatic or semiautomatic firearm ownership in the United States. American Journal of Public Health 1997;87(2):286-288.

Hemenway D, Solnick SJ, Azrael DR. Firearm training and storage. Journal of the American Medical Association 1995;273(1):46-50.

Hendricks CM, Reichert A. Parents' self-reported behaviors related to health and safety of very young children. Journal of School Health 1996;66(7):247-251.

Hensler DR, Marquis MS, Abrahams AF, Berry SH, Ebener PA, Lewis EG, Ling EA, MacCoun RJ, Manning WG, Rogowski JA, Vaiana ME. Compensation for accidental injuries in the United States. Santa Monica, CA: RAND Corporation. Report No. R-3999-HHS/ICJ, 1991.

Home Safety Council. The State of Home Safety in America: The Facts About Unintentional Injuries in the Home, 2002 Edition. Wilkesboro, NC: Home Safety Council, 2002.

Howard KA, Webster DW, Vernick JS. Beliefs about the risks of guns in the home: analysis of a national survey. Injury Prevention 1999;5(4):284-289.

Howes DR. An evaluation of the effectiveness of child-resistant packaging. Washington, DC: US Consumer Product Safety Commission, 1978.

Hunt DK, Lowenstein SR, Badgett RG, Marine WM, Garrett CJ, Steiner JF. Detection of injury-prone behaviors among internal medicine patients. Journal of General Internal Medicine 1992; 7(6):573-582.

Jadack RA, Pare B, Kachur P, Zenilman JM. Self-reported weapon ownership, use and violence experience among clients accessing an inner-city sexually transmitted disease clinic. Research in Nursing and Health 2000;23(3):213-221.

Johnson KC, Ford DE, Smith GS. The current practices of internists in prevention of residential injury. American Journal of Preventive Medicine 1993;9(1):39-44.

Johnston BD, Britt J, D'Ambrosio L, Mueller BA, Rivara FP. A preschool program for safety and injury prevention delivered by home visitors. Injury Prevention 2000;6(4):305-309.

Kakalik JS, Pace NM. Costs and compensation paid in tort litigation (R-3391-ICJ). Santa Monica, CA: RAND Corporation, 1986.

Kellermann AL, Fuqua-Whitley DS, Sampson SR, Lindenmann W. Public opinion about guns in the home. Injury Prevention 2000;6(3):189-194.

Lawrence BA, Miller TR, Jensen AF, Fisher D, Zamula W. Estimating the costs of nonfatal consumer product injuries in the United States. Journal for Injury and Safety Promotion 2000; 7(2):97-113.

Liller KD, Craig J, Crane N, McDermott RJ. Evaluation of a poison prevention lesson for kindergarten and third-grade students. Injury Prevention 1998;4(3):218-221.

Liller KD, Kent EB, Arcari C, McDermott RJ. Risk factors for drowning and near-drowning among children in Hillsborough County, Florida. Public Health Reports 1993;108(3):346-353.

Liller KD, Kent EB, McDermott RJ. Postpartum patients' knowledge, risk perceptions, and behaviors pertaining to childhood injuries. Journal of Nurse-Midwifery 1991;36(6):355-360.

Logan P, Branche CM, Sacks JJ, Ryan G, Peddicord J. Childhood drownings and fencing of outdoor pools in the United States, 1994. Pediatrics 1998;101(6):E3.

Mayer JP, Anderson C, Gabriel K, Soweid R. A randomized trial of an intervention to prevent lawnmower injuries in children. Patient Education and Counseling 1998;34(3):239-246.

Mayer M, LeClere FB. Injury prevention measures in households with children in the United States, 1990. Advance Data 1994;(250):1-16.

McKnight RH, Struttmann TW, Mays JR. Finding homes without smoke detectors: one step in planning burn prevention programs. Journal of Burn Care and Rehabilitation 1995;16(5):548-556.

McLoughlin E, Annest JL, Fingerhut LA, Rosenberg HM, Kochanek KD, Pickett D, Berenholz G. Recommended framework for presenting injury mortality data. Morbidity and Mortality Weekly Report Recommendations and Reports 1997;46(RR-14).

McLoughlin E, Fingerhut L, Weiss H, Annest L. A proposed mechanism/intent matrix for presenting E-coded data. Unpublished report. Atlanta, GA: National Center for Injury Prevention and Control, Centers for Disease Control and Prevention. July 1995.

Miller TR. The plausible range for the value of life: red herrings among the mackerel. Journal of Forensic Economics 1990;3(3):75-89.

Miller TR. Variations between countries in values of statistical life. Journal of Transport Economics and Policy 2000;34(2):169-188.

Miller TR, Cohen MA, Wiersema B. Victim costs and consequences: a new look. Washington, DC: National Institute of Justice, 1996.

Miller TR, Lawrence BA, Jensen AF, Waehrer GM, Spicer RS, Lestina DC, Cohen MA. Estimating the cost of consumer product injuries: the revised injury cost model. Final report to the U.S. Consumer Product Safety Commission, January 1998a.

Miller TR, Lestina DC, Spicer RS. Highway crash costs in the United States by driver age, blood alcohol level, victim age, and restraint use. Accident Analysis and Prevention 1998b;30(2):137-150.

Miller TR, Romano EO, Spicer RS. The cost of childhood unintentional injuries and the value of prevention. The Future of Children 2000;10(1):137-163.

Mobley C, Sugarman JR, Deam C, Giles L. Prevalence of risk factors for residential fire and burn injuries in an American Indian Community. Public Health Reports 1994;109(5):702-705.

Moreland J, Richardson J, Chan DH, O'Neill J, Bellissimo A, Grum RM, Shanks L. Evidence-based guidelines for the secondary prevention of falls in older adults. Gerontology 2003;49(2):93-116.

Morrison TC, Hofstetter CR, Hovell M. Firearm ownership and safety practices: a random-digit dial survey of San Diego. American Journal of Preventive Medicine 1995;11(6):364-370.

Mull DS, Agran PF, Winn DG, Anderson CL. Household poisoning exposure among children of Mexican-born mothers: an ethnographic study. Western Journal of Medicine 1999;171(1):16-19.

National Center for Injury Prevention and Control, Centers for Disease Control and Prevention. Blood lead levels among children in high-risk areas - California, 1987-1990. Morbidity and Mortality Weekly Report 1992;41(17):291-294. Available online at: http://www.cdc.gov/mmwr/preview/mmwrhtml/00016606.htm.

National Center for Injury Prevention and Control, Centers for Disease Control and Prevention. Falls and hip fractures among older adults. Available online at: http://www.cdc.gov/ncipc/factsheets/falls.htm.

National Center for Injury Prevention and Control, Centers for Disease Control and Prevention. Fire deaths and injuries: fact sheet. Available online at: http://www.cdc.gov/ncipc/factsheets/fire.htm.

National Center for Injury Prevention and Control, Centers for Disease Control and Prevention. Poisonings: fact sheet. Available online at: http://www.cdc.gov/ncipc/factsheets/poisoning.htm.

National Center for Injury Prevention and Control, Centers for Disease Control and Prevention. Spotlight on choking episodes among children. Available online at: http://www.cdc.gov/ncipc/duip/spotlite/choking.htm.

National Center for Injury Prevention and Control, Centers for Disease Control and Prevention. Table 1. Recommended framework of E-Code groupings for presenting injury mortality and morbidity data (may 15, 2003). Available online at: http://www.cdc.gov/ncipc/whatsnew/matrix2.htm.

National Center for Injury Prevention and Control, Centers for Disease Control and Prevention. WISQARS Injury Data. Available online at: http://www.cdc.gov/ncipc/wisqars/default.htm.

National Fire Protection Association. NFPA fact sheets: automatic fire sprinkler systems. Available online at: http://www.nfpa.org/Research/NFPAFactSheets/Sprinkler/Sprinkler.asp.

National Fire Protection Association. NFPA fact sheets: home fires. Available online at: http://www.nfpa.org/Research/nfpafactsheets/homefire/homefire.asp.

National Fire Protection Association. NFPA fact sheets: smoke alarms- make them work for your safety. Available online at: http://www.nfpa.org/Research/NFPAFactSheets/alarms/alarms.asp.

National SAFE KIDS Campaign. Injury facts: burn injuries. Available online at: http://www.safekids.org/tier3_cd.cfm?folder_id=540&content_item_id=1011.

National Safety Council. Injury Facts, 2001 Edition. Itasca, IL: National Safety Council, 2001.

Nelson DE, Grant-Worley JA, Powell K, Mercy J, Holtzman D. Population estimates of household firearm storage practices and firearm carrying in Oregon. Journal of the American Medical Association 1996;275(22):1744-1748.

Nordstrom DL, Zwerling C, Stromquist AM, Burmeister LF, Merchant JA. Rural population survey of behavioral and demographic risk factors for loaded firearms. Injury Prevention 2001;7(2):112-116.

Pichoff BE, Schydlower M, Stephenson SR. Children at risk for accidental burns from hot tap water. Texas Medicine 1994;90(11):54-58.

Polivka BJ, Ryan-Wenger N. Health Promotion and injury prevention behaviors of elementary school children. Pediatric Nursing 1999;25(2):127-134.

Porter EJ, Severtson DJ. Indicators of possible lead exposure among children attending public lead screening clinics: implications for primary prevention. Public Health Nursing 1997;14(1):12-19.

Powell KE, Jacklin BC, Nelson DE, Bland S. State estimates of household exposure to firearms, loaded firearms, and handguns, 1991 through 1995. American Journal of Public Health 1998;88(6):969-972.

Price JH, Clause M, Everett SA. Patients' attitudes about the role of physicians in counseling about firearms. Patient Education and Counseling 1995;25(2):163-170.

Public Health Service and Health Care Financing Administration. International Classification of Diseases, Ninth Revision, Clinical Modification. Sixth Edition. Washington, DC: United States Public Health Service, 1998.

Robin LF, Beller M, Middaugh JP. Statewide assessment of lead poisoning and exposure risk among children receiving Medicaid services in Alaska. Pediatrics 1997;99(4):E9.

Quan L, Gore EJ, Wentz K, Allen J, Novack AH. Ten-year study of pediatric drownings and near-drownings in King County, Washington: lessons in injury prevention. Pediatrics 1989;83(6):1035-1040.

Rodgers GB. The effectiveness of child-resistant packaging for aspirin. Archives of Pediatrics and Adolescent Medicine 2002;156(9):929-933.

Rodgers GB. The safety effects of child-resistant packaging for oral prescription drugs: two decades of experience. Journal of the American Medical Association 1996;275(21):1661-1665.

Runyan CW. Using the Haddon Matrix: introducing the third dimension. Injury Prevention 1998;4(4):302-307.

Runyan CW, Bangdiwala SI, Linzer MA, Sacks JJ, Butts J. Risk factors for fatal residential fires. New England Journal of Medicine 1992;37(12):859-863.

Santer LJ, Stocking CB. Safety practices and living conditions of low-income urban families. Pediatrics 1991;88(6):1112-1118.

Schaffer SJ, Kincaid MS, Endrest N, Weitzman M. Lead poisoning risk determination in a rural setting. Pediatrics 1996;97(1):84-90.

Schaffer SJ, Szilagyi PG, Weitzman M. Lead poisoning risk determination in an urban population through the use of a standardized questionnaire. Pediatrics 1994;93(2):159-163.

Scherz RG. Prevention of childhood aspirin poisoning: clinical trials with three child-resistant containers. New England Journal of Medicine 1971;285(24):1361-1362.

Schuster M, Franke T, Bastian A, Sor S, Halfon N. Firearm storage patterns in US homes with children. American Journal of Public Health 2000;90(4):588-594.

Schwarz DF, Grisso JA, Miles C, Holmes JH, Sutton RL. An injury prevention program in an urban African-American community. American Journal of Public Health 1993;83(5):675-680.

Senturia YD, Christoffel KK, Donovan M. Children's household exposure to guns: a pediatric practice-based survey. Pediatrics 1994;93(3):469-475.

Senturia YD, Christoffel KK, Donovan M. Gun storage patterns in US homes with children: a pediatric practice-based survey. Pediatric Practice Research Group. Archives of Pediatrics and Adolescent Medicine 1996;150(3):265-269.

Sharp GB, Carter MA. Prevalence of smoke detectors and safe tap-water temperatures among welfare recipients in Memphis, Tennessee. Journal of Community Health 1992;17(6):351-365.

Shaughnessy AF, Cincotta JA, Adelman A. Family practice patients' attitudes toward firearm safety as a preventive medicine issue: a HARNET study. Journal of the American Board of Family Practitioners 1999;12(5):354-359.

Sibert JR, Craft AW, Jackson RH. Child-resistant packaging and accidental child poisoning. Lancet 1977;2(8032):289-290.

Smith SK, DeFrances CJ, Langan PA. Tort cases in large counties (Special Report NCJ-153177). Washington, DC: U.S. Department of Justice, April 1995.

Snyder DC, Mohle-Boetani JC, Palla B, Fentersheib M. Development of a population-specific risk assessment to predict elevated blood lead levels in Santa Clara County, California. Pediatrics 1995;96(4):643-648.

Spangenberg KB, Wagner MT, Hendrix S, Bachman DL. Firearm presence in households of patients with Alzheimer's Disease and related dementias. Journal of the American Geriatrics Society 1999;47(10):1183-1186.

Stennies G, Ikeda R, Ledbetter S, Houston B, Sacks J. Firearm storage practices and children in the home, United States, 1994. Archives of Pediatrics and Adolescent Medicine 1999;153(6):586-590.

Stevens MM, Gaffney CA, Tosteson TD, Mott LA, Olson A, Ahrens MB, Konings EK. Children and guns in a well-child cohort. Preventive Medicine 2001;32(3):201-206.

Stiles NJ, Bratcher D, Ramsbottom-Lucier M, Hunter CG. Evaluating fire safety in older persons through home visits. Journal of the Kentucky Medical Association 2001;99(3):105-110.

Striph KB. Prevalence of lead poisoning in a suburban practice. The Journal of Family Practice 1995;41(1):65-71.

Sutton PM, Athanasoulis M, Flessel P, Guirguis G, Haan M, Schlag R, Goldman LR. Lead levels in the household environment of children in three high-risk communities in California. Environmental Research 1995;68(1):45-57.

Thompson DC, Rivara FP. Pool fencing for preventing drowning in children. Cochrane Database of Systematic Reviews 2000;(2):CD001047.

Thompson R, Summers S, Rampey-Dobbs R, Mani MM, Hiebert JH, Schneider S. The effect of instruction on burn prevention in eighth-grade students in preparation for babysitting. Journal of Burn Care & Rehabilitation 1992;13(4):482-486.

United States Consumer Product Safety Commission. Child-resistant lighters protect young children. Available online at: http://www.cpsc.gov/cpscpub/pubs/5021.html.

United States Consumer Product Safety Commission. Household extension cords can cause fires. Available online at: http://www.cpsc.gov/cpscpub/pubs/5032.html.

United States Consumer Product Safety Commission. Overheated clothes dyers can cause fires. Available online at: http://www.cpsc.gov/cpscpub/pubs/5022.html.

United States Bureau of the Census. National population estimates. Available online at: http://eire.census.gov/popest/archives/national/nat_90s_detail/nat_90s_4.php.

United States Department of Justice, Bureau of Justice and Statistics. Criminal victimization in the United States, 1999. Available online at: http://www.ojp.usdoj.gov/bjs/abstract/cvusst.htm.

United States Fire Administration. Fire in the United States: 1989-1998. Emmitsburg, MD: Federal Emergency Management Association, United States Fire Administration, National Fire Data Center, 2001.

Walton WW. An evaluation of the Poison Prevention Packaging Act. Pediatrics 1982;69(3):363-370.

Weil DS, Hemenway D. Loaded guns in the home: analysis of a national random survey of gun owners. Journal of the American Medical Association 1992;267(22):3033-3037.

Wiktor SZ, Gallaher MM, Baron RC, Watson ME, Sewell CM. Firearms in New Mexico. Western Journal of Medicine 1994;161(2):137-139.

Wiley CC, Casey R. Family experiences, attitudes, and household safety practices regarding firearms. Clinical Pediatrics 1993;32(2):71-76.

Wintemute GJ, Wright MA. The attitude-practice gap revisited: risk reduction beliefs and behaviors among owners of residential swimming pools. Pediatrics 1991;88(6):1168-1171.

Zaloshnja E, Miller TR. The economic burden of traffic crashes in employers. Washington, DC: Department of Transportation, National Highway Traffic Safety Administration, 2003. Available online at: http://www.nhtsa.dot.gov/people/injury/airbags/EconomicBurden/index.html.

Zwerling C, Merchant JA, Nordstrom DA, Stromquist AM, Burmeister LF, Reynolds SJ, Kelly KM. Risk factors for injury in rural Iowa: round one of the Keokuk County rural health study. American Journal of Preventive Medicine 2001;20(3):230-233.

Technical Appendices

APPENDIX I: Methods for Estimating Fatal and Nonfatal Unintentional Home Injury

National Datasets

Datasets from the National Center for Health Statistics (Centers for Disease Control and Prevention) were selected to obtain the most complete picture of the incidence and patterns of fatal and nonfatal unintentional home injury in the United States. A description of these datasets is included in **Table AI.1**.

Table AI.1. Description of national datasets.

Data Source	Description
National Vital Statistics System (NVSS)	**Federal compilation of fatality information from death certificates.** **Estimates of unintentional home injury *deaths* were obtained from NVSS.**
National Health Interview Survey (NHIS)	**Principal source of information on the health of the civilian noninstitutionalized population in the United States based on a national household survey.** **Estimates of unintentional *nonfatal* home injuries occurring three months prior to survey administration, and which required solicitation of advice or therapy from any health care professional and/or resulted in lost work days and/or school, were obtained from NHIS.**
National Hospital Ambulatory Medical Care Survey - Emergency Department (NHAMCS-ED)	**Utilization and provision of ambulatory care services in hospital emergency departments based on a national sample of visits to emergency departments of noninstitutional general and short-stay facilities, exclusive of federal, military and Veterans Administration hospitals.** **Estimates of unintentional home injuries resulting in an *emergency department visit* were obtained from NHAMCS-ED.**

All data and codebooks were downloaded from The Inter-University Consortium for Political and Social Research (ICPSR) at the University of Michigan in Ann Arbor (http://www.icpsr.umich.edu/index.html). Established in 1962, the ICPSR is a member-based organization with over 500 domestic and international college and university members. The ICPSR maintains and provides access to an archive of data for purposes of research and instruction.

Analysis Datasets

Subsets of the National Center for Health Statistics (NCHS) datasets were created based on three factors: (1) death/health condition was an injury or poisoning, (2) injury or poisoning was unintentional, and (3) injury or poisoning occurred at home.

Injury and poisoning cases were identified by "external cause of injury codes" (E-codes) available in the NCHS datasets. E-codes are assigned in accordance with the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) for the purpose of classifying environmental events, circumstances, and conditions for causes of injury and poisoning. The ICD-9-CM was designed by the United States Public Health Service and the World Health Organization for the classification of morbidity and mortality information for statistical purposes, the indexing of hospital records by disease and operations, and data storage and retrieval. E-codes between 800 and 999 (E800-E999) are used to classify deaths and nonfatal health conditions resulting in an injury or poisoning.

E-codes were grouped to classify the manner, or intent, of the injury or poisoning incident using a framework developed by the National Center for Injury Prevention and Control (NCIPC) and the National Center for Health Statistics of the Centers for Disease Control and Prevention. The recommended framework is presented in full on the NCIPC website at http://www.cdc.gov/ncipc/whatsnew/matrix2.htm. For purposes of this report, only *unintentional* injury and poisoning cases were selected for analysis. E-codes corresponding to unintentional injury and poisoning incidents are presented in **Table AI.2**.

Table AI.2. Recommended framework of E-code groupings for presenting injury mortality and morbidity data. Unintentional injury only.

Data Source	Description
All Injury	E800 - E869, E880 - E929
Cut/Pierce	E920 (.0-.9)
Drowning/Submersion	E830 (.0-.9), E832 (.0-.9), E910 (.0-.9)
Fall	E880.0 - E886.9, E888
Fire/Burn	E890.0 - E899, E924 (.0-.9)
Firearm	E922 (.0-.3, .8,.9)
Machinery	E919 (.0-.9)
Motor Vehicle	E810 - E819 (.0-.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
Natural/Environmental	E900.0 - E909, E928 (.0-.2)
Overexertion	E927
Poisoning	E850.0 - E869.9
Struck By/Against	E916 - E917.9
Choking/Suffocation	E911 - E913.9
Miscellaneous	E846 - E848, E914 - E915, E918, E921 (.0-.9), E922 (.4-.5), E923 (.0-.9), E925.0 - E926.9, E928 (.3,.8), E929 (.0-.5,.8)
Unspecified	E887, E928.9, E929.9

The data were further stratified by location to obtain all unintentional injury and poisoning cases that *occurred at home*. Each of the national datasets had a variable for the place of occurrence, which allowed stratification of incidents occurring at home, compared with those that occurred in a location other than the home and those where the location was unknown.

Limitations of the Data

National Health Interview Survey (NHIS) -- Poisoning data from NHIS were archived in ICPSR in two separate files, one for years 1997 through 1999 and the second for years 2000 through 2001. In the first file (1997 – 1999), data for the intent and location of nonfatal poisoning cases were not available. Therefore, nonfatal poisonings between 1997 and 1999 were not included in the analysis for this report.

National Hospital Ambulatory Medical Care Survey- Emergency Department (NHAMCS-ED) -- Data processing errors in the ICPSR dataset for NHAMCS-ED resulted in the exclusion of 1995 data in the analysis for this report.

APPENDIX II: Unintentional Home Injury Costing Methods

Using methods presented in *The State of Home Safety in America (2002)*, unintentional home injury costs were estimated for years 1997-2001. For comparison purposes, the cost for injuries caused by violence, motor vehicles, suicide acts, and other unintentional mechanisms were also estimated.

Costing Methods

The costing follows the approach recommended by the Panel on Cost-Effectiveness in Health and Medicine (Gold et al., 1996). A societal perspective that includes all costs associated with the injuries (e.g., costs to victims, families, government, insurers, and taxpayers) is used for all cost calculations. The costs are incidence-based, meaning all costs that will result from an injury over time are counted in the year the injury occurs. For costs that will occur in future years, the "present value" is estimated, defined as the amount one would have to invest today in order to pay these costs when they come due. The present value of future costs depends on how many years in the future the costs are borne and on the discount rate. This report uses the 3 percent discount rate that the Panel recommends.

Costing Mortality, National Health Interview Survey and National Hospital Discharge Survey Data

Medical Costs. To calculate the cost of hospital-admitted nonfatal injuries, lengths of hospital stays for each injury were multiplied by costs per day of stay, by diagnosis and age group. The per diem costs came from 1994-1995 Maryland and New York data adjusted to match the average per diem in the United States. Only these two states accurately track costs by service, not just charges. Because hospital costs exclude physician and allied health personnel (e.g., physical therapist) fees, professional fees were added by applying the estimated ratio of professional fees to hospital payments from 1992-1994 Civilian Health and Medical Program of the Uniformed Services (CHAMPUS) data. Medical costs incurred after discharge were obtained by applying the ratio of inpatient payments to short-term, pre-hospital and post-hospital discharge spending (on average, 6 months after discharge) provided by the National Medical Expenditure Survey (NMES). Multiplying this ratio times the inpatient-cost estimates yields estimated short-term costs.

Lifetime medical costs (beyond 6 months) were estimated from the short-term medical costs. The Detailed Claims Information (DCI) database of the National Council on Compensation Insurance and the Medstat private health insurance claims file provide data by diagnosis group on the percentage of lifetime medical payments paid in the first six months after injury. Dividing the short-term costs by the percentage paid in the short term yields estimated lifetime costs. The DCI and Medstat files do not fully capture lifetime costs for paralyzing spinal cord injuries or for catastrophic injuries resulting in institutionalization in a nursing home. Spinal cord injury medical costs use cost trajectory data from Berkowitz et al. (1990). Costs for cases discharged to nursing homes apply the length of stay and per diem estimates from Lawrence et al. (2000). The violence costs add mental health care costs from Cohen and Miller (1998).

Finally, the costing accounts for the cost of processing medical payments. Claims processing costs are a fraction of medical claims payments, which vary by payer. From published insurance statistics and studies of Medicare and Medicaid claims processing costs, Lawrence et al. (2000) estimated the payer-specific ratios of claims processing costs. Multiplying these ratios by the medical costs for the payer identified in the discharge data yields the processing cost estimates.

Medical costs of nonfatal injuries not admitted to the hospital were computed from CHAMPUS data on costs per visit and the number of visits in the first six months, NMES data on ancillary payments, and the claims processing cost ratios. DCI data for non-admitted cases were used to estimate lifetime costs from these short-term costs.

Medical costs of fatalities were estimated by taking into account their probability of occurrence at six different places of death (death-on-scene, death-on-arrival, death at the emergency department, death at the hospital after inpatient admission, death at home, and death at a nursing home) by cause and age group (computed from National Vital Statistics System data). Medical cost at each place of death was estimated by taking into account the medical costs associated with the intervention of a coroner, funeral, emergency department (including transportation and administrative costs), hospital (including transportation and administrative costs), and nursing home. Coroner and funeral cost estimates came from published national surveys. Emergency department cost was estimated from South Carolina data. Hospital-based costs were estimated from Maryland and New York data. Nursing home costs were estimated using the methods of Lawrence et al. (2000).

Work Loss Costs. For nonfatal injuries, the work loss cost is the sum of the lifetime loss due to permanent disability plus the cost due to temporary disability. Probabilities that injuries to employed people caused wage work loss came from the National Health Interview Survey (NHIS). The days of work loss per temporarily disabled person losing work were estimated from the 1993 Survey of Occupational Injury and Illness of the U.S. Bureau of Labor Statistics.

For fatalities and permanently disabling injuries, the present value of lifetime work losses was computed using a standard age-earnings model (Miller et al., 1998a). Probabilities of permanent disability by diagnosis group, and whether hospital-admitted, were estimated from the DCI as was the percentage disabled for injuries causing partial, permanent disability.

Household work days lost were estimated from wage work days lost. The value of household work came from published data (Expectancy Data 2000), as did the fringe benefit rate to apply to the wage losses. Work losses by family and friends who care for injured children were computed by assuming that someone would stay home and care for a child for the same number of days that an adult suffering a similar injury would have lost from work.

Quality-of-Life Cost. Medical costs, other resource costs and work losses are readily measured in monetary terms. Placing a monetary value on pain, suffering, and lost quality of life, however, is challenging and controversial. For this reason, this portion of burden is first quantified with a non-monetary measure, quality-adjusted life years, or QALYs. A QALY is a health outcome measure that assigns a value of 1 to a year of perfect health and 0 to death (Gold et al., 1996). QALY loss is determined by the duration and severity of the health problem. The fraction of perfect health lost for each year that a victim is recovering from a health problem or living with a residual disability is estimated and then summed over years. People killed lose a full QALY per life-year, a conventional assumption that ignores pre-existing conditions and the general decline in health as people age. As Gold et al. (1996) recommend, like costs, this report discounts future QALY losses to present value at a 3 percent discount rate. This discount rate is necessary to account for the uncertainty over future health and medical treatments; for example, someday we may cure paralysis, or the victim might die of cancer next year.

To estimate this cost, first the years of potential life lost to fatal injuries plus the quality-adjusted life years (QALY) lost to nonfatal injuries were summed (Miller et al., 2000). For each death, the years of potential life lost were estimated from a life expectancy table. The nonfatal QALY estimates combined

physician ratings of the impact of injuries over time on a person's ability to think, see, walk, and so forth, and on pain, with diagnosis-specific DCI data on the probability that an injury would permanently reduce earning capacity or prevent the victim from working. Second, the estimated impairment impacts were translated into QALY losses using survey data that weighted the relative importance respondents placed on different dimensions of impact.

To value the lost years, one starts by estimating the value people place on survival. The value of survival is measured from the amounts people spend (in dollars or time) for safety. Sixty-five technically sound, "willingness to pay" studies have estimated this value (Miller, 1990 & 2000). They examine such things as markets for auto safety features and smoke alarms, extra wages paid to get workers to take risky jobs, and speed choice when driving.

The value of survival is essentially the combined value of future work and quality of life. Subtracting the lost future work yields the quality of life costs per death. To value nonfatal injuries from the QALY losses, one calculates the percentage of lifetime survival lost to each injury then multiplies this percentage times the value of survival. The value of survival used is $104,236 per QALY.

Costing the National Electronic Injury Surveillance System Data

To cost the National Electronic Injury Surveillance System (NEISS) data, this report adapted the U.S. Consumer Product Safety Commission's Injury Cost Model (ICM). The ICM was built from the same medical and work-loss costs used to cost the National Health Interview Survey (NHIS) and National Hospital Discharge Survey (NHDS) data throughout this report. The medical costing procedures and data are identical except that long-term medical cost patterns are not tailored by age in the ICM. National Medical Expenditure Survey and NHIS data were used to differentiate the costs of non-admitted injury victims treated in emergency departments from victims treated only in doctors' offices or clinics. Work loss costing methods are also identical.

Costing of lost quality of life, however, is done quite differently. The ICM places a dollar value on quality of life lost using equations derived from analysis of the pain and suffering component of 1,986 jury awards and settlements to victims of nonfatal injuries involving consumer products. The cases include product liability cases, cases involving bicyclists injured by motor vehicles, and premises liability cases that involved consumer products (e.g., a leg broken in falling down the stairs or tripping over a toy that a child dropped on the sidewalk). Class action suits were excluded from the analysis.

The ICM includes several minor cost factors that were not considered in the costs for other injuries. These cost factors represent less than 3 percent of the costs of consumer product injury. Losses to family and friends were estimated as: (1) a fixed cost of transporting the victim to and from the treatment facility, plus (2) an additional daily cost for visitors of hospital-admitted patients. Employer losses were estimated analytically from supervisor and worker wage data in combination with assumptions about the amount of nonproductive time resulting from an injury. A product liability insurance component reflects costs associated with defending the insured manufacturer or seller, the costs of claims investigation and payment, and general underwriting and administrative expenses. It excludes insurance sales costs. Estimated insurance costs are derived from aggregated insurance industry data (A.M. Best and Co., 1996). Legal costs include court and claims expenses, plaintiff attorney fees and time spent by plaintiffs, defendants and witnesses. Estimates are based on survey research data on the probability of reaching different stages of litigation, for example filing a lawsuit or a trial (Smith, 1995) and the variable costs at each stage of litigation (Kakalik, 1986).

Note Regarding Cost Data

Note that the cost figures presented in this report for year 1998 and those that appear in *The State of Home Safety in America (2002)*, which presents cost figures for year 1998, differ due to refinements in the costing procedures used by the Pacific Institute for Research and Evaluation for estimating the cause of injury for cases that were missing cause codes. The refinements for the second edition were made to: (1) assure consistency with ICD-10 cause categories used in the more recent years of mortality data, and (2) improve estimates for causes that were previously estimated from very small numbers of raw cases.

Also note that cost figures may not add to the totals presented in the tables due to rounding of figures to the nearest dollar.

APPENDIX III: The State of Home Safety in America - 2002 Survey Methods

Instrument Content and Development

The questionnaire was designed to elicit information about several issues important to home safety with particular emphasis on falls, fires, scalds, carbon monoxide poisoning, poisoning by other means, and firearms. Questions were directed at identifying the presence of safety hazards (e.g., presence of space heaters, absence of stair railings) as well as protective practices (e.g., carbon monoxide detectors, smoke alarms and firearm storage practices). In addition, information was collected about household composition and socio-demographics (e.g., ages of persons living in the household, income, home ownership), prior injuries occurring in the home, features of the home (e.g., type of dwelling, number of floors) and geographic region. Finally, we asked respondents to indicate: "What one thing, if anything, would you most like to do in the next year to prevent unintentional injuries in your home?".

Questionnaire development involved multiple drafts reviewed by members of the study team as well as Home Safety Council personnel. A complete draft of the instrument was pre-tested and final revisions were made based on feedback from the interviewers. The final instrument included 92 items and was administered in approximately 10 minutes.

Sampling of Respondents

Sampling involved random digit dialing methods using a sample of telephone numbers from active residential telephone exchanges in the continental United States (i.e., excluding Alaska and Hawaii). Only English-speaking adults were considered eligible as respondents.

Survey Administration

The survey was programmed by personnel at the Survey Research Unit (SRU) at the University of North Carolina (UNC) School of Public Health and administered using the Computer Assisted Telephone Interviewing (CATI) method. The CATI system prompts the interviewer on screen with each question and provides hints about question interpretation for the purpose of increasing consistency across interviewers. Data from the interview were entered directly on the screen and, ultimately, compiled in a data file for cleaning and analysis.

The SRU trained all interviewers in basic survey administration methods. In addition, Dr. Carol Runyan and Ms. Renee M. Johnson conducted an additional training session with the interviewers to explain the specific purposes of items included in the instrument and to share information about the overall project and the Home Safety Council. With the assistance of Ms. Ashley Bowers, final item revisions were made based on feedback from the interviewers about pre-test results.

Interviewing occurred over a period of approximately 11 weeks, with up to 20 calls made to each identified number, with callbacks made at different times of the day and days of the week.

Data Management and Analysis

Data were prepared in a SAS data file by SRU and transmitted to the UNC Injury Prevention Research Center for analysis. Analyses focused on simple frequencies for the entire sample as well as stratified analyses within subgroups (e.g., by home type, household composition). The data presented in this report reflect the application of sampling weights to adjust for multiple telephone lines in the household, presence of children under 7 years of age, presence of adults 70 or older, and home ownership status. These weights allow estimates from the sample to reflect the overall population of households in the United States.

In addition, the open-ended item about what they would like to do to prevent unintentional injuries in their home was hand-coded into categories by Dr. Daniel Macklin (UNC Department of Pediatrics), with assistance from Drs. Anna Waller and Tamera Coyne-Beasley.

Glossary

Adjusted rates are used to compare the incidence in two (or more) groups, adjusting for differences in the groups on one or more variables, such as age. The adjustment procedure involves the application of a common standard to the groups.

Attitudes are people's biases, inclinations, or tendencies that influence their response to situations, activities, people or program goals.

Bite/Sting injury is a poisonous or non-poisonous bite or sting through the skin. Category includes dog bites, cat bites, snake or lizard bites, and insect bites.

Cause of death refers to the one underlying condition attributed to every death, based on information reported on the death certificate and international rules for selecting the underlying cause of death from all reported conditions.

Choking/Suffocation is inhalation, aspiration or ingestion of food or other object that blocks the airway or causes suffocation; mechanical suffocation due to hanging, strangulation, lack of air in a closed place, plastic bag or from falling earth.

Consumer product refers to products that are produced or distributed for the personal use, consumption, or enjoyment of a consumer.

Computer Assisted Telephone Interviewing (CATI) is the use of computers to automate the key activities of a telephone interviewing facility, such as data entry.

Cut/Pierce injury results from an incision, slash, perforation, or puncture by a pointed or sharp instrument, weapon or object. Category does not include injury from being struck by or against a blunt object (such as the side of a night stand) or bite wounds.

Death rate is a measure derived by dividing the number of deaths in a population in a given time period by the resident population over that same time period.

Disability is the reduction of a person's capacity to perform wage-earning or household work.

Discount rate is a percentage used to convert future dollars or intangible losses into their present value equivalent. For example, at a 3% discount rate, $10 one year from now has a present value of $10/(1.03), $10 two years from now has a present value of $10/(1.03 squared), etc.

Drowning refers to a death resulting from suffocation within 24 hours of submersion in water.

E-Codes (also known as external cause of injury codes) were developed by the United States Public Health Service and the World Health Organization as a categorization scheme for the International Classification of Diseases. E-Codes include injuries caused by motor vehicles, falls, firearms, drownings and near drownings, fires and burns, poisonings and other causes.

Fall injury is the result of a person descending abruptly due to the force of gravity and striking a surface at the same or lower level.

Fatality is a death.

Fire/Burn injury is damage to tissue in the skin or places deeper in the body from severe exposure to flames, heat or chemicals, or from inhalation of smoke and toxic fumes caused by a fire.

Firearm injury is damage to tissue caused by bullets or other projectile shot from a powder-charged gun.

Foreign body is an injury resulting from entrance of a foreign body into or through the eye or other natural body opening that does not block the airway or cause suffocation. Examples include a pebble or dirt in the eye or small childrens' toys in the esophagus.

Health, as defined by the World Health Organization, is a state of physical, mental, and social well-being and not merely the absence of disease and infirmity.

Hospital discharge is the completion of any continuous period of stay of one night or more in a hospital as an inpatient.

Impairment is a physiological, psychological or anatomical abnormality of bodily structure or function caused by disease or injury.

Incidence is the development of an illness or the occurrence of an injury during a given period of time in a specified population.

Incidence rate is a measure of the number of new events (illness or injury) that occur in a defined period of time, relative to the number of persons in the population at-risk during that same time period.

Injury control is an organized effort to prevent injuries or to minimize their severity.

Injury is unintentional or intentional damage to the body resulting from acute exposure to thermal, mechanical, electrical or chemical energy or from the absence of such essentials as heat or oxygen.

Intent is the state of mind of a person involved in an injury episode that forms the basis for categorizing an injury as unintentional (traditionally termed accidental), as a homicide or assault, or as a suicide/self-inflicted.

Intentional injury is injury that has been purposely inflicted either by oneself or someone else.

International Classification of Diseases Codes (ICD codes) is a system for classifying illness and injuries developed by the United States Public Health Service and the World Health Organization. ICD codes include E-Codes (or, external cause of injury codes).

Intervention is a term used in public health to describe a program or policy designed to have an impact on a health problem.

Item refers to one question or statement on an instrument used to measure knowledge, attitudes, beliefs or behaviors.

Life expectancy is the number of additional years of life expected at a specified point in time, such as at birth or age 65.

Machinery injury involves operating machinery, such as drill presses and large power saws. Category does not include injury involving machines not in operation or injuries from powered lawn mowers or other powered hand tools or home appliances.

Medical costs include emergency medical services, physician, hospital, rehabilitation, prescription and other related costs, such as crutches, physical therapy, funeral/coroner expenses, and administrative costs of processing medical payments to providers. These costs factor in hospital transportation and stay, as well as medical costs the injured person will pay until he or she dies. This estimate also includes nonfatal injuries not admitted to the hospital.

Miscellaneous injury is associated with any other specified cause of injury that does not fit another E-code category. Some examples include causes, such as electric currents, electrocution, fireworks, or animal scratch.

Morbidity refers to illness or disease not resulting in death.

Natural/Environmental injury results from exposure to adverse natural and environmental conditions (such as severe heat, severe cold, lightning, sunstroke, large storms, and natural disaster), as well as lack of food or water.

Near-drowning refers to survival for at least 24 hours after suffocation from submersion in water.

Overexertion is working the body or a body part too hard, causing damage to muscle, tendon, ligament, cartilage, joint or peripheral nerves (e.g., common cause of strains, sprains, and twisted ankles). Category includes overexertion from lifting, pushing, pulling or from excessive force.

Pedal cyclist (other) injury is an injury to a pedal cycle rider from a collision, loss of control, crash or some other event involving a moving vehicle or pedestrian. Category includes riders of unicycles, bicycles and tricycles.

Pedestrian (other) injury is the result of being struck by or against a vehicle.

Poisoning is the ingestion, inhalation, absorption through the skin, or injection of so much of a drug, toxin, or other chemical that a harmful effect results.

Prevalence is the proportion of persons in a population who have a particular disease or injury at a specified point in time or during a specific time period.

Public health includes organized community efforts to ensure conditions in which people can be healthy. It refers to activities that society undertakes to prevent, identify and counter threats to the health of the public.

Quality-adjusted life year (QALY) is a measure that assigns a value of 1 to a year of perfect health and a value of 0 to death. In this report, QALY loss is determined by the duration and severity of the health problem caused by injury. The fraction of perfect health lost for each year the victim spends recovering or living with a disability is estimated and then added together. For example, a person who is killed falling down the stairs loses a full QALY per life-year they had left to live according to generally accepted life expectancy tables. People who are permanently injured lose a part of each QALY, depending on the severity of their injury.

Quality-of-life costs are the dollar values placed on pain, suffering and lost quality of life to the injured person and their family.

Scald injury is damage to tissue in the skin or places deeper in the body from exposure to a hot substance or object, caustic or corrosive material, or steam.

Struck by/against injury results from being hit or crushed by, or hitting against, a human, animal, or inanimate object or force other than a vehicle or machinery.

Surveillance is the ongoing and systematic collection, analysis, and interpretation of health data essential to the planning, implementation and evaluation of public health practice, closely integrated with the timely dissemination of these data to those who need to know. The final link in the surveillance chain is the application of these data to disease and injury prevention and control.

Transport (other) injury is injury to a person riding in or on transport vehicles and involved in a collision or other event with another vehicle (other than motor vehicles or motorcycles), pedestrian or animal. Category includes horseback riding and battery-powered carts.

Unintentional injury is an injury judged to have occurred without anyone intending that harm be done.

Unspecified injury refers to injuries for which the original data collection instrument (e.g., emergency department report, interview survey) does not provide enough information to describe the cause of injury.

Vital statistics are systematically collected statistics on births, deaths, marriages, divorces and other life events.

Willingness to pay is the value people place on reducing the risk of death and injury.

Work loss costs are victims' lost wages, as well as the value of lost household work, fringe benefits (if applicable) and the employers' administrative costs of processing compensation for lost earnings through litigation, insurance or public welfare programs. For nonfatal injuries, this is the sum of the lifetime loss due to permanent disability plus the cost due to temporary disability. For fatalities and permanently disabling injuries, the present value of lifetime work losses is used as a base for calculations. Work missed by family and friends who care for injured children is also included. The value of household work came from published data (Expectancy Data, 2000), as did the fringe benefit rate to apply to the wage losses. Work losses by family and friends who care for injured children were computed by assuming that someone would stay home and care for a child for the same number of days that an adult suffering a similar injury would have lost from work.

Notes

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