

CDC Injury Fact Book



CDC

Injury Fact Book

National Center for Injury Prevention and Control
Centers for Disease Control and Prevention

Atlanta, Georgia
November 2006

The *CDC Injury Fact Book* is a publication of the National Center for Injury Prevention and Control, Centers for Disease Control and Prevention.

Centers for Disease Control and Prevention

Julie Louise Gerberding, MD, MPH
Director

Coordinating Center for Environmental Health and Injury Prevention

Henry Falk, MD, MPH
Director

National Center for Injury Prevention and Control

Ileana Arias, PhD
Director

Acknowledgments

Thank you to the staff of the National Center for Injury Prevention and Control (NCIPC), CDC's Injury Center, for help in compiling the *CDC Injury Fact Book*. Special thanks go to Carole Craft and Sue Swensen for editing material found in this book and to Kendra Godbold for editorial assistance; Krista Hopkins Cole, Sandee L. Coulberson, Michele Huitric, Alida Knuth, Marie Legg, Jennifer Middlebrooks, Jane Mitchko, Sarah Olson, Kelly Sarmiento, and Robin Sloan for their prompt, cheerful responses to the seemingly endless requests for data and program descriptions; Tracey Foster-Butler for identifying and obtaining photographs; Sara Cote for desktop publishing and creative solutions; Julie Hentz, Robert Noble, and Sevena Quattlebaum for graphics support; and Sandra Bonzo for her counsel, broad knowledge of injury topics, and diligence beyond the norm. To those who are dedicated to the Injury Center, this book celebrates your achievements and contributions.

Suggested citation: National Center for Injury Prevention and Control. *CDC Injury Fact Book*. Atlanta (GA): Centers for Disease Control and Prevention; 2006.

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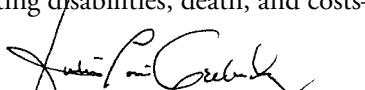
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Directors' Messages

Every day, the Centers for Disease Control and Prevention's (CDC) extraordinary team of dedicated men and women works around the clock and around the globe to protect Americans' health. CDC has two overarching goals for health protection:

- All people—and especially those at greatest risk for health disparities—will achieve their optimal lifespan with the best possible quality of health in every stage of life.
- People in all communities will be protected from infectious, occupational, environmental, and terrorist threats.

CDC's National Center for Injury Prevention and Control (NCIPC) plays a critical role in reaching these goals. From protecting infants and toddlers against injuries in the home, to preventing youth violence, to researching how communities can best prepare for and handle large-scale emergencies, NCIPC is dedicated to keeping Americans safe from injuries and violence—and reducing their resulting disabilities, death, and costs—across all life stages.

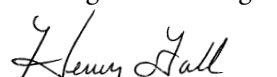


Julie L. Gerberding, MD, MPH

Director, Centers for Disease Control and Prevention



The work of NCIPC contributes greatly to CDC's efforts to address the safety needs of its most important client—the American people. NCIPC provides national leadership in identifying research priorities and promoting tools for injury and violence prevention, joins with partners to turn research into actions that reduce injuries and disabilities, and prompts action for a safer, healthier nation through a wide range of programs.

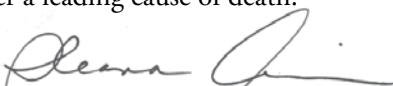


Henry Falk, MD, MPH

Director, Coordinating Center for
Environmental Health and Injury Prevention



Preventable injuries and violence take the lives of thousands of Americans each year. One of CDC's health impact goals is to reduce deaths from injuries. At NCIPC, we take that goal seriously, and we work tirelessly to meet or exceed it. And we're making progress. We have seen reductions in bullying, fewer young children who ride unrestrained in cars, and fewer older adults who die in residential fires. But there is much more to do. As you will see by the programs described in this fact book, we are studying how, when, and why injuries occur; developing and testing new strategies to prevent injuries; and disseminating to at-risk populations the prevention strategies that have been proven to work. We pledge to continue our efforts until injuries are no longer a leading cause of death.



Ileana Arias, PhD

Director, National Center for
Injury Prevention and Control



Introduction

America is rapidly changing—its population is more mobile, more diverse, and older. Health care costs are soaring and our country is more vulnerable to outside threats. What hasn't changed, and continues to be a public health concern, is the toll injuries take on individuals and on the nation.

Injuries in a Changing America

“The financial and economic impact of injuries in the United States is serious. However, by expanding our science-based injury prevention programs, we can drastically reduce these costs and even more importantly help people live longer and healthier lives.”

CDC Director, Dr. Julie Gerberding

Injuries Affect Everyone

Regardless of gender, race, or economic status, injuries remain a leading cause of death for Americans of all ages, accounting for more than 161,000 deaths in 2002. But injury deaths are only part of the picture. Millions of Americans are injured each year and survive. In 2004, about 29.6 million people were treated for an injury in U.S. hospital emergency departments, of which nearly 2 million injuries were severe enough to require hospitalization. For many people, the injury causes temporary pain and inconvenience; but for some, the injury leads to disability, chronic pain, and a profound change in lifestyle.

An injury affects more than just the person injured—it affects everyone involved in the injured person’s life. With a fatal injury, family, friends, coworkers, employers, and other members of the injured person’s community feel the loss.

In addition to experiencing grief, they may experience a loss of income or the loss of a primary caregiver, as well.

With a nonfatal injury, family members are often called upon to care for the injured person, which can result in stress, time away from work, and possibly lost income. They may also experience a change in their relationship with the injured person and with others in the family. For example, if a wife and mother is seriously injured, her spouse may find himself in the role of primary caregiver—not only for his wife, but also for their children. Friends of the injured person may be called upon to help and, like family members, may experience a change in their relationship with the injured person. The injured person’s employer may struggle with the temporary or permanent loss of a valued employee. Others in the community—volunteer groups, religious organizations, neighbors—may also feel the effects of the injury.

10 Leading Causes of Death by Age Group – 2003

Rank	Age Groups										Total
	<1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+	
1	Congenital Anomalies 5,621	Unintentional Injury 1,717	Unintentional Injury 1,096	Unintentional Injury 1,522	Unintentional Injury 15,272	Unintentional Injury 12,541	Unintentional Injury 16,766	Malignant Neoplasms 49,843	Malignant Neoplasms 95,692	Heart Disease 563,390	Heart Disease 685,089
2	Short Gestation 4,649	Congenital Anomalies 541	Malignant Neoplasms 516	Malignant Neoplasms 560	Homicide 5,368	Suicide 5,065	Malignant Neoplasms 15,509	Heart Disease 37,732	Heart Disease 65,060	Malignant Neoplasms 388,911	Malignant Neoplasms 556,902
3	SIDS 2,162	Malignant Neoplasms 392	Congenital Anomalies 180	Suicide 244	Suicide 3,988	Homicide 4,516	Heart Disease 13,600	Unintentional Injury 15,837	Chronic Low. Respiratory Disease 12,077	Cerebro-vascular 138,134	Cerebro-vascular 157,689
4	Maternal Pregnancy Comp. 1,710	Homicide 376	Homicide 122	Congenital Anomalies 206	Malignant Neoplasms 1,651	Malignant Neoplasms 3,741	Suicide 6,602	Liver Disease 7,466	Diabetes Mellitus 10,731	Chronic Low. Respiratory Disease 109,139	Chronic Low. Respiratory Disease 126,382
5	Placenta Cord Membranes 1,099	Heart Disease 186	Heart Disease 104	Homicide 202	Heart Disease 1,133	Heart Disease 3,250	HIV 5,340	Suicide 6,481	Cerebro-vascular 9,946	Alzheimer's Disease 62,614	Unintentional Injury 199,277
6	Unintentional Injury 945	Influenza & Pneumonia 163	Influenza & Pneumonia 75	Heart Disease 160	Congenital Anomalies 451	HIV 1,588	Homicide 3,110	Cerebro-vascular 8,127	Unintentional Injury 9,170	Influenza & Pneumonia 57,670	Diabetes Mellitus 74,219
7	Respiratory Distress 831	Septicemia 85	Septicemia 39	Chronic Low. Respiratory Disease 81	Influenza & Pneumonia 224	Diabetes Mellitus 657	Liver Disease 3,020	Diabetes Mellitus 5,658	Liver Disease 6,428	Diabetes Mellitus 54,919	Influenza & Pneumonia 65,163
8	Bacterial Sepsis 772	Perinatal Period 79	Benign Neoplasms 38	Influenza & Pneumonia 72	Cerebro-vascular 221	Cerebro-vascular 583	Cerebro-vascular 2,460	HIV 4,442	Suicide 3,843	Nephritis 35,254	Alzheimer's Disease 63,457
9	Neonatal Hemorrhage 649	Chronic Low. Respiratory Disease 55	Chronic Low. Respiratory Disease 37	Benign Neoplasms 41	Chronic Low. Respiratory Disease 191	Congenital Anomalies 425	Diabetes Mellitus 2,049	Chronic Low. Respiratory Disease 3,537	Nephritis 3,806	Unintentional Injury 34,335	Nephritis 42,453
10	Circulatory System Disease 591	Benign Neoplasms 51	Cerebro-vascular 29	Cerebro-vascular 40	HIV 178	Influenza & Pneumonia 373	Influenza & Pneumonia 992	Viral Hepatitis 2,259	Septicemia 3,651	Septicemia 26,445	Septicemia 34,069

Source: National Vital Statistics System, National Center for Health Statistics, CDC.
Produced by: Office of Statistics and Programming, National Center for Injury Prevention and Control, CDC.

The Cost of Injuries

Society at large is profoundly affected by injuries. Unintentional injuries are the leading cause of death for Americans ages 1 to 44. Homicide and suicide are the second and third leading causes of death for persons ages 15 through 34 years. More than 16% of the population (44.7 million) reported needing treatment for at least one injury in 2000. Insurance costs and out-of-pocket spending for all medical services are quantified by the Medical Expenditure Panel Survey (MEPS), a nationally-representative survey of the U.S. civilian noninstitutionalized population. MEPS reported that injuries in 2000 contributed to 10% of U.S. medical expenditures; when MEPS percentages were applied to the annual National Health Accounts data (which trace expenditures within the health care system), injury-related medical expenditures were estimated to cost Americans \$117 billion each year.

Medical spending due to injuries is of the same magnitude as costs associated with other leading public health concerns such as obesity and smoking. By age group, costs ranged from \$5 billion for 20- to 29-year-olds to \$37.9 billion for ages 45 to 64, with the greatest injury-related medical costs (\$23.3 billion) for women ages 45 to 64. Overall, injury-attributable medical costs were higher for males (\$59.8 billion) than females (\$57.4 billion).

Although staggering, these costs still underestimate the overall societal burden caused by injury. When other losses are considered, a more definitive cost estimate emerges. Productivity losses, emotional toil, loss of patient and caregiver time, nonmedical expenditures (e.g., wheelchair ramps), litigation, diminished quality of life, and long-term consequences (e.g., rehabilitation and mental health care costs) must also be considered. A future CDC study will examine the cost of injuries from this broader perspective. Already, CDC's Injury Center activities

TABLE. Percentage and number* of persons reporting treatment for an injury and percentage and amount of medical expenditures attributable to injuries, by selected characteristics — United States, 2000

Characteristic	Persons reporting treatment for an injury [†]		Medical expenditures attributable to injuries [†]	Injury-attributable medical expenditures (\$)		
	(%)	No. [§]		%	MEPS [¶]	NHA ^{**}
Total	(16.3)	44.7	10.3	64.7	117.2	427
Sex						
Male	(17.3)	23.1	12.5	33.2	59.8	448
Female	(15.4)	21.6	9.2	31.8	57.4	409
Age group (yrs)						
<10	(11.9)	4.8	7.8	3.1	5.7	141
10–19	(17.9)	7.2	16.6	7.4	13.4	333
20–29	(15.8)	5.7	6.8	2.7	5.0	137
30–44	(17.8)	11.3	12.2	14.6	26.5	417
45–64	(16.7)	10.2	10.6	20.9	37.9	621
≥65	(16.7)	5.5	8.7	16.0	29.0	881
Sex by age group						
Male						
<10	(13.7)	2.8	9.4	1.6	3.0	145
10–19	(20.7)	4.3	26.3	5.1	9.2	445
20–29	(18.0)	3.2	7.9	1.0	1.7	98
30–44	(20.0)	6.2	15.3	7.5	13.6	438
45–64	(15.5)	4.6	7.9	7.6	13.7	463
≥65	(14.2)	2.0	11.8	9.6	17.4	1,233
Female						
<10	(9.9)	1.9	6.7	1.3	2.3	118
10–19	(15.0)	3.0	11.9	3.0	5.4	272
20–29	(13.6)	2.5	4.8	1.4	2.5	139
30–44	(15.7)	5.1	9.4	6.7	12.1	373
45–64	(17.9)	5.7	12.5	12.9	23.3	732
≥65	(18.5)	3.5	6.7	7.1	12.9	680

* In millions.

† On the basis of Medical Expenditure Panel Survey (MEPS) estimates.

§ Results were weighted to be nationally representative.

¶ In billions. MEPS estimate of U.S. medical expenditures in 2000 is restricted to the civilian, noninstitutionalized population.

** In billions. National Health Accounts (NHA) estimates include the U.S.-based military and institutionalized populations and are calculated by multiplying the NHA estimate of U.S. medical expenditures in 2000 by the percentage of medical expenditures attributable to injuries estimated by MEPS.

such as effective interventions and prevention programs are paving the way for substantial reduction of the economic burden of injury in this country (Finkelstein et al. 2004).

Injury Prevention and CDC

Injuries have been a leading cause of death and disability throughout history; consequently, many people and agencies have undertaken prevention efforts. In 1985, the National Research Council and the Institute of Medicine (IOM) recognized the need for a coordinated effort to prevent injuries in the United States. They identified CDC as the federal agency best suited to lead injury research. CDC had a strong history of

interdisciplinary research, data collection and analysis, information sharing, and relationships with states—elements the council and IOM deemed important. And unlike other federal agencies involved in injury prevention, CDC had no regulatory or enforcement role. In 1997, IOM's Committee on Injury Prevention and Control recommended that no one agency could effectively serve as the sole leader for injury. Rather, agencies should collaborate on injury prevention and control activities, with each agency leading in its area of expertise. As it is, CDC's Injury Center now functions as the focal point for the public health approach to preventing and treating injuries, a paradigm that enriches the entire injury field.

The Public Health Approach to Injury Prevention



To solve public health problems—including injuries—CDC uses a systematic process called the public health approach. This approach has four steps: define the problem, identify risk and protective factors, develop and test prevention strategies, and assure widespread adoption of effective injury prevention principles and strategies.

Define the problem

Before we can address an injury problem, we need to know how big the problem is, where it is, and whom it affects. CDC accomplishes this by gathering and analyzing data—processes often called “surveillance.” These data can show us how an injury problem changes over time, alert us to troubling trends in a particular type of injury, and let us know what impact prevention programs are having. Decision makers use these critical data in allocating programs and resources to the areas most in need.

Identify risk and protective factors

It is not enough to know that a certain type of injury is affecting a certain group of people in a certain area. We also need to know why. What factors put people at risk for that injury? And conversely, what factors protect people from it? CDC conducts and supports research to answer these

important questions. Once we have that information, we can develop and implement programs to eliminate or reduce risk factors for injuries and to capitalize on or increase factors that protect people from being injured.

Develop and test prevention strategies

In this step, we put knowledge into action. Using information gathered in our research, CDC develops strategies to prevent particular injury problems. We implement these strategies in communities that are experiencing the problem. And we study the effects of these strategies to determine whether and how well they’re working. We use this information to identify any elements we need to change to eliminate difficulties or increase effectiveness.

Assure widespread adoption

What we learn in the developing and testing step has little benefit if we keep the information to ourselves. In this final step of the public health approach, CDC shares its knowledge and may provide funding or expert consultation so that communities can replicate these successful strategies.

The Public Health Approach



The Public Health Approach at Work

Defining the Problem

For some injury issues, CDC has already moved through the first three steps of the public health approach and is encouraging widespread adoption of programs that work. For other issues, CDC is working to fully define the problem. Always, CDC addresses injury issues that affect diverse populations, in every stage of life.

The examples in this book demonstrate how the public health approach is at work in CDC's Injury Center.

Violent death in America

In the United States in 2002, 17,638 people died as a result of homicide and 31,655 died from suicide. Although public health officials may know how many people die from violence each year, information about the circumstances surrounding those deaths is often lacking. Federal, state, and local agencies all have detailed data that could answer important, fundamental questions about violence patterns and trends, but the information is fragmented and difficult to access. The system that pulls together this vital information to be shared among states and communities is the National Violent Death Reporting System (NVDRS). NVDRS gathers data from states that can be used to increase our understanding of violent deaths in America. NVDRS data can assist policy makers and community leaders in making informed decisions about strategies and programs to prevent violence. Currently, 17 states have been funded to implement the system.

Injury mortality among Native American children and youth

Native Americans ages 19 years and younger are at greater risk of preventable injury-related deaths than are other children and youth in the United States. A 2003 study published in CDC's *Morbidity and Mortality*

Weekly Report found that injuries and violence account for 75% of all deaths among Native Americans in this age group—a rate that is about twice that of all children and youth in the United States. Motor vehicle crashes were the leading cause of injury-related death, followed by suicide, homicide, drowning, and fires. Between 1989 and 1998, more than 3,300 Native American children and youth living on or near reservations died from injuries or violence (Wallace et al. 2003).

Intimate partner and sexual violence

An estimated 2.3 million Americans—1.5 million of them women—are raped or physically assaulted by an intimate partner each year. But inconsistencies in data collection and different ways of describing the problem have fostered a lack of consensus about its magnitude. In 2002, CDC's Injury Center revised its publication of definitions designed to improve data collected about intimate partner violence. This publication standardized the terminology used by all parties involved in the problem: the criminal justice system, hospitals, and others. Similar standards for sexual violence were also published in 2002. Uniform definitions and recommended data elements for both intimate partner violence and sexual violence are important to ensure consistency in the use of terminology and to standardize data collection. Consistent data allow researchers to better gauge the scope of the problem, identify high-risk groups, and monitor the effects of prevention programs.



Report to Congress on mild TBI

Evidence indicates that mild traumatic brain injury (MTBI) is a public health problem, the magnitude and impact of which are underestimated by current surveillance systems. Much research is needed to determine the full magnitude of MTBI, to identify preventable and modifiable risk factors, to develop and test strategies to reduce MTBI, and to improve outcomes for those who sustain these injuries. Such research will inform the development of more effective primary prevention strategies and policies to address the service and rehabilitation needs of persons with MTBI. The recommendations in the CDC report to Congress, *Mild Traumatic Brain Injury in the United States: Steps to Prevent a Serious Public Health Problem*, can help shape that research.

Nonfatal drownings at recreational water sites

In 2004, CDC scientists published in the *Morbidity and Mortality Weekly Report* the first national estimate for nonfatal drowning injuries treated in emergency departments (Gilchrist et al. 2004). Findings for the United States in 2001 and 2002 showed more than 4,100 people sought care in an emergency department each year for nonfatal drowning injuries, with more

than half requiring hospital admission or transfer for higher levels of care. Children ages 4 and under and males of all ages were at the greatest risk. The most common locations of nonfatal injuries for very young children were residential pools. As children grew older, more injuries occurred in natural water settings. The study also confirmed that injuries happen most often on weekends and during summer months—times when people typically enjoy water-related activities.

Identifying Risk and Protective Factors

Suicide

More than 31,000 people took their own lives in 2002. Public health officials want to expand the understanding of what puts people at risk for committing or attempting suicide and what prevents them from doing so. Injury Center staff and CDC-funded researchers have begun studying factors that may increase or decrease a person's risk for suicide. One study in Texas, which interviewed people who experienced nearly lethal suicide attempts, found that many factors—in addition to mental health factors—may influence suicidal behavior including alcohol use, geographic mobility, exposure to suicidal behavior, hopelessness, help-seeking behavior, impulsiveness, and physical illness. Researchers at Emory University examined suicide risk factors among African Americans ages 18 to 44 and found a strong connection between intimate partner violence and suicidal behavior among African-American women.

Human behavior in residential fires

CDC is directing development of the Human Behavior in Fire Study to identify behavioral factors in residential fires that are associated with injuries and fatalities. Researchers

will interview survivors of residential fires to gather information about the sequence of events and learn more about their behaviors before, during, and after the fire. Researchers will gather and analyze data about the root cause of the fire, the events that led to an injury, the state of awareness and impairment level of those involved, and the actions taken in response to the fire. Results from this study will inform public health interventions to reduce the number of injuries and deaths in residential fires. CDC is developing this study with the Battelle Centers for Public Health Research and Evaluation, in collaboration with the Department of Fire Protection Engineering at the University of Maryland at College Park.

Developing and Testing Prevention Strategies

Targeting injury problems in states

Solving the problems of injury and violence in America requires a strong public health response. Both research and effective injury prevention programs in states are needed to help those at risk and to avoid costly injuries and needless deaths. In 2002, CDC began funding the Targeted Injury Intervention Program in four states to individually plan, develop, and implement prevention programs that target an important injury problem identified in each state. Maine and Virginia have each developed suicide prevention programs, while Washington and Michigan have focused on fall prevention. In 2002–2003, state injury experts planned and developed their prevention programs, and in 2004 the programs were implemented. The targeted programs continued through 2005, as the states tested prevention strategies in preparation to share the results.

Parenting strategies to prevent child maltreatment

CDC has launched several initiatives aimed at preventing child maltreatment through evidence-based parenting programs. These programs and policies encourage and promote positive parent-child interactions. Improving parenting skills will help parents and caregivers better manage behavior *before* violence can occur. CDC is funding the University of South Carolina to examine the effectiveness of the Triple P—Positive Parenting Program in reducing the risk of child maltreatment by enhancing the knowledge, skills, and confidence of parents. Even the most effective parenting programs will have a limited impact on child maltreatment if parents either do not attend or do not learn to apply alternative parenting skills. CDC is working with Purdue University and the University of Oklahoma Health Sciences Center to test ways to reduce attrition and improve engagement and compliance in parenting programs.

Community-based cognitive therapy for suicide attempters

CDC is working with the University of Pennsylvania to test the effectiveness of a cognitive therapy intervention for suicide attempters. Trained therapists at community mental health centers are conducting the intervention. The target group—people who have attempted suicide—consists largely of ethnic minorities and economically disadvantaged individuals exhibiting high rates of mental health and substance-use disorders. A previous study found that a brief cognitive intervention designed specifically for this high-risk population and delivered in a university setting reduced subsequent suicide attempts. The current study will implement the program in the community and evaluate its effectiveness for preventing subsequent suicide attempts.



Violence prevention for middle school students

CDC is testing one of the largest efforts to date to assess the effectiveness of school-based violence prevention among middle school students. It teaches students conflict resolution and problem-solving skills, trains teachers about violence prevention, and engages family members in program activities. The project is being conducted in 37 middle schools in four states. Affiliations include Virginia Commonwealth University, University of Illinois–Chicago, University of Georgia, and Duke University.

A boost for children ages 4 to 8

CDC's Injury Center funded state health departments in Colorado, Kentucky, and New York to develop, implement, and evaluate community-based programs to increase booster seat use among children ages 4 to 8. Between 2000 and 2003, grantees implemented and evaluated community awareness campaigns and school-based programs, aired public service announcements, posted billboards, and conducted booster seat distribution events and

car seat checkpoints. Evaluation data from Colorado showed a significant increase in booster seat use in target communities when compared with control communities. Results from these intervention evaluations will help guide future efforts to increase booster seat use.

Fall prevention strategies and effectiveness: Dane County SAFE Study

In October 2002, CDC's Injury Center funded the Wisconsin Department of Health, in collaboration with the University of Wisconsin, to conduct a randomized controlled trial to assess the effectiveness of a comprehensive approach to preventing falls among higher-risk adults age 65 and older. This project will use two complementary strategies: a comprehensive at-home assessment (followed by individualized risk reductions) and a broad-based program to educate primary care physicians and other health practitioners. To learn more about preventing falls among older adults, visit www.cdc.gov/ncipc/pub-res/toolkit/toolkit.htm.

Remembering When: a fire and fall prevention program

In October 2000, CDC began funding state health departments in Arkansas, Maryland, Minnesota, North Carolina, and Virginia to implement and evaluate Remembering When: A Fire and Fall Prevention Program for Older Adults. This curriculum, which was developed by the National Fire Protection Association, the U.S. Consumer Product Safety Commission, CDC, and other partners, is the first program of its kind to educate older adults about prevention of both fall- and fire-related injuries. To date, more than 510 group presentations (with 12,427 attendees) and 3,566 individual/home presentations have been conducted. More than 4,300 smoke alarms and 525 grab bars have been installed in the homes of older adults. Research is underway to measure the program's effectiveness.

Assuring Widespread Adoption

Effective interventions against alcohol-impaired driving

In systematic reviews of published research studies, CDC researchers found strong evidence for the effectiveness of 0.08% blood alcohol concentration (BAC) laws, minimum legal drinking age laws, sobriety checkpoints, and mass media campaigns that meet certain conditions (i.e., careful audience research, adequate audience exposure, and presence of other alcohol-impaired driving prevention activities). They also found sufficient evidence of the effectiveness for lower BAC laws specific to young or inexperienced drivers ("zero tolerance" laws) and intervention training programs for alcohol servers. Finally, they found sufficient evidence that school-based education programs decrease riding with alcohol-impaired drivers (though there was insufficient evidence

regarding the programs' effects on alcohol-impaired driving itself). These school-based interventions were effective in reducing fatal and nonfatal alcohol-related motor vehicle crashes. The reviews were published in *The Guide to Community Preventive Services* (2005) and are online at www.thecommunityguide.org.

Smoke alarm installation and fire-safety education

CDC has funded states to install smoke alarms and to provide fire-safety education in high-risk communities, targeting households with children ages 5 years and younger and adults ages 65 years and older. An informal sample of program homes found that since 1998, an estimated 1,071 lives may have been saved. In addition, program staff have canvassed more than 382,000 homes and installed more than 275,000 long-lasting smoke alarms.

TBI tool kit for health care professionals

In 2002, CDC produced *Heads Up: Brain Injury in Your Practice* specifically for primary care physicians—CDC's first educational tool kit related to traumatic brain injury (TBI). The tool kit contains practical, easy-to-use clinical information, patient information in English and Spanish, scientific literature, and CD-ROM with printable versions of the materials in the kit. More than 150,000 copies have been distributed to health care providers nationwide and internationally. Although the tool kit was originally developed for physicians, many other health care providers, such as nurse practitioners and physical therapists, have requested the materials. CDC has received positive feedback from more than 2,000 recipients of the tool kit.

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Planning for the Future

We have a strategic roadmap to improve the health of Americans, set forth in Healthy People 2010 disease prevention and health promotion objectives. To meet these objectives, CDC's Injury Center developed an agenda to articulate its priorities for research and injury prevention. And, CDC has refocused its mission in the form of new Health Protection Goals to make the best use of resources and to ensure steady, measurable progress toward meeting health challenges. Together, these three documents set the foundation for an even better CDC, with even greater health impact.

Healthy People 2010

Healthy People 2010 is a comprehensive set of disease prevention and health promotion objectives for the nation to achieve in the first decade of this century.

Created by scientists and evidence based, Healthy People 2010 identifies a wide range of public health priorities and specific, measurable objectives for improving the health of all people. Its overarching goals are to increase quality and years of healthy life and to eliminate health disparities. It details 28 focus areas and 467 specific objectives for reaching these goals. Healthy People 2010 serves as a model for state and international disease prevention and health promotion plans.

Injury Research Agenda

The *CDC Injury Research Agenda* is a five-year plan to help guide CDC's Injury Center activities, thereby meeting the objectives of Healthy People 2010. The *Agenda* was developed in 2002 with extensive input from CDC's academic research centers, national nonprofit organizations, and other federal agencies with a stake in injury prevention and control.

The *Agenda* sets priorities and serves as a blueprint for research, prevention, and cost analysis of injury in key areas:

- At home and in the community;
- Sports, recreation, and exercise;
- Transportation;
- Intimate partner violence, sexual violence, and child maltreatment;
- Suicidal behavior;
- Youth violence;
- Acute care; and
- Disability and rehabilitation.



In 2003, the Injury Center reviewed its agenda for acute care, disability, and rehabilitation and identified that acute injury care—in the context of terrorism preparedness and response—was not addressed. The Injury Center and its partners collaborated to revise the acute injury chapter to clearly state CDC's highest priorities for acute care research. The chapter, "Acute Injury Care Research Agenda," was released at the CDC-sponsored 2005 National Injury Prevention and Control Conference.

Implementing the *Agenda* will be a challenge, but improving the infrastructure of the nation's health care system is vital to the public's health. By defining research needs in a diverse field, CDC's Injury Center maximizes efficient and effective use of resources; encourages collaboration among researchers and practitioners; and fulfills its public health responsibilities. The *Agenda* also serves as a resource for policy makers, educators, service providers, and others interested in learning more about how the Injury Center addresses all phases of the injury research framework—from foundational research through dissemination research—for all major causes of injury among all age groups. To view the *Agenda*, log on to www.cdc.gov/ncipc/pub-res/research_agenda.htm.

CDC's Health Protection Goals

CDC has defined specific Health Protection Goals to prioritize and focus its work, to maximize its investments, and to measure progress. With the Health Protection Goals in place, CDC prepares people for emerging health threats and renews its commitment to help Americans obtain optimal health in every stage of life.

New strategies, new goals, and innovative ways to conduct business bring new focus to the agency's work, enabling CDC to do even more to protect and improve health. As part of CDC, the Injury Center is setting a new course to meet these challenges. The new goals for the CDC and the Injury Center continue to improve upon how priorities are set and how resources are allocated. To strengthen its leadership position in injury prevention, the Injury Center is increasing support to state agencies and academic institutions, informing and guiding others through national conferences on injury topics, and responding to CDC's goals for preparedness (see pages 49 and 51). And, along with other national centers at CDC, the Injury Center is disseminating meaningful health-related information in the context of life stages and protection needs (see page 31). As America changes, CDC's Injury Center is also changing to better support the public's health needs (CDC 2005).

References

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The Institute of Medicine's and National Academy of Sciences' 1985 and 1989 reports prompted a national call for a consolidated federal focus on injury prevention. Key goals: build an infrastructure; bring the public health perspective to injury prevention; and apply the same proven prevention techniques used for infectious disease transmission and chronic illness to reducing injury and its consequences.

1992

National Injury Center

HHS Secretary Donna E. Shalala officially creates a national center to prevent and control injuries. On June 25, 1992, CDC establishes the National Center for Injury Prevention and Control.

Expanding Injury Research

CDC continues funding of 10 Injury Control Research Centers (ICRCs) to study ways to prevent injuries and disabilities. ICRCs, started in 1987, are located at universities nationwide. ICRCs serve as training centers and conduct research in prevention, acute care, and rehabilitation. More ICRCs were added in 2002 and in 2004.

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National Plan Emerges

Using recommendations of the Secretary's Advisory Committee for Injury Prevention and Control, the injury control community prioritizes injury recommendations and publishes *Injury Control in the 1990s: A National Plan for Action*.

Violence Prevention

Health Affairs publishes a sentinel article about violence prevention in which CDC scientists call for a new vision: people and their communities approaching violence as a problem that can be understood and changed. This vision emphasizes *prevention* and how science is integral to identifying effective policies and programs.

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First National Injury Survey

CDC conducts nationwide Injury Control and Risk Survey (ICARIS) to assess various injury risk factors. Data from the first ICARIS are published in 1996 and highlight the severity of the injury problem in the U.S.



Reduction of Bicycle-related Head Injuries

CDC-funded Harborview ICRC in Seattle determines that community educational campaigns, such as the Washington Children's Bicycle Helmet Campaign, can increase helmet use and decrease incidence of bicycle-related head injuries.

The next year, CDC publishes its first guidelines for bicycle helmets in a series of Injury Control Recommendations (*Morbidity and Mortality Weekly Report Recommendations and Reports*). The guidelines for state and local agencies provide analysis of bicycle-related head injuries, the value of bicycle helmets in reducing head injuries, helmet standards, performance in crashes, barriers that keep people from wearing helmets, and recommendations for increasing helmet use.

National Violence Against Women Survey (NVAWS)

CDC and the National Institute of Justice sponsor a U.S.-wide telephone survey to provide national estimates of intimate partner violence (including sexual violence and stalking). Information about the problem and magnitude of intimate partner violence will help practitioners improve prevention programs. Several publications emerge from this survey including *Extent, Nature, and Consequences of Intimate Partner Violence: Findings From the National Violence Against Women Survey, July 2000*.

Website

CDC launches its injury website, providing consumers and health professionals access to information about effective ways to prevent injury.

National Standards

CDC's *Guidelines for the Surveillance of a Central Nervous System Injury* is released. The *Guidelines* serve as the U.S. standard for collecting information on traumatic brain and spinal cord injuries, forming the basis for international guidelines published by the World Health Organization.

Linking Hospital Emergency Departments

CDC hosts a national workshop on emergency department (ED) data. A year later, CDC publishes *Data Elements for Emergency Department Systems (DEEDS)*, which sets uniform specifications and national standards for data entry in EDs' patient records.

School Violence

CDC releases findings from the first nationwide investigation of school-associated violent deaths. Data collection continues and CDC releases updated findings in December 2001.

Brain Injury

CDC funds 15 state health departments to track the incidence of traumatic brain injury (TBI), a disability affecting more than 5 million Americans (four times the people with HIV or AIDS). The information will inform states' decisions on developing TBI prevention programs, educate the public and policy makers about TBI, and document the need for additional services.

Youth Violence Compendium

CDC publishes *Measuring Violence-Related Attitudes, Behaviors, and Influences Among Youths: A Compendium of Assessment Tools*. The *Compendium* provides researchers and prevention specialists with tools to assess factors related to youth violence and to evaluate prevention programs. A second edition is published in 2005.



Smoke Alarms

CDC begins a three-year program to reduce injuries from house fires by funding 14 states to install long-lasting smoke alarms in high-risk homes with young children and older adults. The results: more than 161,000 home visits, more than 116,000 smoke alarm installations, and more than 7 million people reached with media-based fire education campaigns. In 2002, 340 lives are saved. Key to this success was earlier CDC injury research:

- In 1997, a *New England Journal of Medicine* study finds that Oklahoma City's targeted program for high-risk populations reduces incidents of residential fire-related injuries.
- CDC funds a small business research project that develops a smoke alarm with a long-lasting, lithium-powered battery and hush buttons. The result: homes are adequately protected for a longer period by a functional alarm.

Fall Prevention

A Tool Kit to Prevent Senior Falls, a program to combat the leading cause of injury death for Americans over 65, is launched. The tool kit is distributed to more than 6,000 older adults in fall prevention programs nationwide. Program materials (in English and Spanish) are distributed through senior centers, hospitals, and health departments.

Intimate Partner Violence

CDC publishes *Intimate Partner Violence Surveillance: Uniform Definitions and Recommended Data Elements* to improve and standardize data collection. These standards will help eliminate inconsistencies in surveillance data and allow researchers to better gauge the problem, identify high-risk groups, and monitor the effects of prevention programs. In 2002, a second edition is published, along with uniform definitions and recommended data elements for sexual violence.

Concussion and Brain Injury

CDC publishes *Facts About Concussion and Brain Injury*, an easy-to-read brochure for the public that explains what happens after a concussion, how to get better, and where to go for information when needed.

DUI and Children

CDC research shows nearly two thirds of children killed in drinking driver-related crashes rode with the impaired driver, spurring some states to introduce legislation that creates special penalties for persons who transport children under age 16 while driving drunk.

Youth Violence

Because the homicide rate for youth under 19 years old averages nine deaths a day, CDC issues *Best Practices of Youth Violence Prevention: A Sourcebook for Community Action*, the first of its kind for youth violence. CDC draws upon real-world experiences to prevent violence among children and adolescents.

National Academic Centers of Excellence on Youth Violence

CDC funds 10 colleges and universities to establish the National Academic Centers of Excellence on Youth Violence. The centers foster efforts between university researchers and communities to address youth violence.

State Profiles

CDC enhances *State Injury Profiles*, reports containing easy-to-read maps and charts, state-by-state comparisons and rankings, and overviews of CDC-supported injury prevention research and programs in each state.

State Core Programs

Addressing gaps in state injury prevention programs, CDC funds 24 states to develop injury surveillance and prevention programs. States with limited resources can now build and maintain programs to address state-identified injury priorities.

SafeYouth.org

CDC helps create the National Youth Violence Prevention Resource Center (NYVPRC), a single, user-friendly source of youth violence information and effective strategies to control and prevent violence. Designed for parents, teenagers, health care providers, law enforcement officials, and other professionals, NYVPRC also offers a Spanish/English toll-free information number and Internet site.



WISQARS™

CDC introduces WISQARS, Web-based Injury Statistics Query and Reporting System, an interactive database that provides researchers, policy makers, media, and the public with customized reports about injury mortality data. Using the U.S. Consumer Product Safety Commission's nonfatal injuries database (National Electronic Injury Surveillance Systems—All Injury Program, or NEISS—AIP), nonfatal injury data are added to WISQARS in 2001.

Injury Prevention in Vietnam

After studying the injury problem in Vietnam, CDC assists the Vietnamese government and UNICEF in developing and implementing the Safe Vietnam initiative. As a result in 2001, Vietnam's prime minister approves a national policy on injury prevention designed to reduce injuries by 30% to 40% by 2010.



Rape Prevention

The Violence Against Women Act of 2000 shifts CDC responsibility for the Rape Prevention and Education Grant Program to the Injury Center. CDC's injury prevention team funds states and territories to strengthen awareness, establish hotlines, and further education and training. This move puts CDC injury prevention funding into every state and U.S. territory.

Lifeguard Effectiveness

CDC publishes its assessment of lifeguard services as a strategy for preventing drowning and water-related injuries. Findings indicate that most drownings occur at sites without lifeguards.

Surgeon General's Report on Youth Violence

The Surgeon General's report on youth violence is released, with an epidemiology chapter written by Injury Center staff. The report highlights risk and protective factors for youth violence and identifies effective, research-based prevention strategies.

Child Maltreatment

Congress appropriates funding for child maltreatment prevention, laying groundwork for today's research and prevention activities, including a focus on parenting.

Injury Surveillance

First *State Injury Indicators Report* is published in partnership with The State and Territorial Injury Prevention Directors Association and the Council of State and Territorial Epidemiologists. This report includes surveillance data on injury and risk factors from 12 states. A second report in 2004 features data from 26 states.

School Health Guidelines

CDC collaborates on *School Health Guidelines to Prevent Unintentional Injuries and Violence*. Recommendations identify effective school policies and practices to prevent unintentional injuries such as playground and sports injuries, violence, and youth suicide.

National Suicide Prevention Strategy

CDC plays a key role in the Federal Steering Group for the Surgeon General's *National Strategy for Suicide Prevention*. The *Strategy* provides national goals and objectives for preventing suicide, promotes awareness about suicide as a preventable public health problem, and discusses how to develop and evaluate prevention programs and enhance tracking systems for suicide.



World Trade Center Attacks

CDC's injury surveillance team conducts rapid assessment of type and severity of injuries among WTC survivors examined at five New York City hospital emergency departments during first 48 hours after attack. Study reveals most of the injured had eye and inhalation problems and were treated on an outpatient basis within hours of the attack.

Injury Center Celebrates 10th Anniversary

CDC celebrates establishment of its Injury Center and a decade of progress by holding four regional meetings across the country. The meetings, which highlight successes in injury prevention fostered by CDC injury research and state program funding, feature experts in youth violence, suicide, drowning, motor vehicle-related, and other types of injury.

CDC Injury Research Agenda

The *CDC Injury Research Agenda* identifies priorities for injury prevention and control research that must be addressed to fulfill CDC's public health responsibilities. In 2003, the Injury Center updates the *Agenda* to address priorities for acute care research. By defining research needs in a diverse field, CDC maximizes use of resources and encourages collaboration between researchers and practitioners.

Reporting Violent Deaths

Six states begin collecting data for the National Violent Death Reporting System (NVDRS), which combines data about violent deaths to enable data sharing, to better understand violence in America, and to help policy makers and community leaders make informed prevention strategies. By 2005, 17 states are funded to implement NVDRS.

Preparedness and Response

CDC launches a website to help the public, clinicians, and public health professionals prepare for and respond to mass casualty events. The site includes a rapid injury assessment tool to help collect core data for investigating the number, type, timing, and severity of injuries associated with a mass trauma event. CDC also funds activities to strengthen collaboration among professionals in acute medical care, trauma, emergency medical services, and state and local health departments.

Injury Surveillance—XIX Winter Olympic Games Salt Lake City

CDC's injury prevention scientists assist the Utah Department of Health in injury surveillance. The public health team monitors nonathlete injury visits to the Olympic venue medical aid stations and area hospital emergency departments. Their timely reporting of injury data rapidly identifies potential public health hazards. This information helps decision makers guide public health interventions and helps event planners involved in future large crowd events.

Poison Control

CDC, the Health Resources and Services Administration (HRSA), and the American Association of Poison Control Centers launch the nation's first comprehensive toll-free poison hotline. Callers from anywhere in the U.S. are routed to poison control centers.

World Report on Violence

CDC collaborates with the World Health Organization on the first *World Report on Violence and Health* to document and raise awareness of violence as a global public health problem.

End Residential Fire Deaths Challenge

CDC works in partnership with the United States Fire Administration (USFA), the U.S. Consumer Product Safety Commission (CPSC), and several nongovernment organizations to eliminate residential fire deaths by the year 2020. Activities include surveillance, research, evaluation, and community programs in high-risk populations, including older adults and children.

Injury Maps

CDC launches Injury Maps, a Web-based, interactive system that enables users to create customized injury-related mortality and injury maps at the national, state, regional, and county levels.

National Injury Conference

The National Injury Prevention and Control Conference “Safety in Numbers” convenes hundreds of professionals working to prevent injuries and resultant deaths and disabilities. The conference highlights effective prevention strategies, advances in injury research, and opportunities to improve programmatic and research skills. It also provides a forum for building partnerships and enhancing collaboration.

Injury among Native Americans

A CDC study reveals that injuries and violence account for three fourths of deaths among Native Americans ages 19 and under—a rate about twice that of all U.S. children and youth.



Traumatic Brain Injury

CDC publishes *Heads Up: Brain Injury in Your Practice*, a tool kit to help physicians recognize and manage traumatic brain injury. It contains practical clinical information and patient materials in English and Spanish.

Supervision and Injury Prevention

CDC convenes experts to assess the role of supervision in preventing unintentional injuries among children and to identify areas where research is needed. Suggestions for models of supervision and intervention research emerge.

Cost of Intimate Partner Violence

CDC reports on the incidence, prevalence, and cost of intimate partner violence against women in the U.S. The report estimates that health-related costs of rape, physical assault, stalking, and homicide by intimate partners exceed \$5.8 billion each year.

Coordinating Center

CDC creates four Coordinating Centers to increase communication and innovation across organizational boundaries. The Injury Center becomes part of the Coordinating Center for Environmental Health and Injury Prevention.

Community Guide

CDC's findings about community efforts to increase child safety seat use appear in *The Guide to Community Preventive Services*. The *Community Guide*, published by an independent task force, provides public health decision makers with recommendations about interventions to promote health and safety and to prevent disease, injury, disability, and premature death.

Road Safety Worldwide

CDC partners with the World Health Organization for World Health Day 2004 to focus on road traffic safety. Injury Center researchers help plan, develop, write, and launch the *World Report on Road Traffic Injury Prevention*, the first report of its kind to underscore the threat that unsafe road traffic systems pose for global public health and development.

CDC also helps develop UN resolutions on traffic injuries and public health and prepares an HHS position statement for the UN General Assembly.

Traumatic Brain Injury in the U.S.

CDC publishes a report that provides detailed information about TBI-related deaths, hospitalizations, and emergency department visits in the U.S. for 1995–2001.

Injury and Violence Conference

More than 750 injury- and violence-related experts gather for the 2005 National Injury Prevention and Control Conference, *Injury and Violence in America: Meeting Challenges, Sharing Solutions*. Featured are more than 260 presentations on topics ranging from violence among teens to coalition building and risk communication.

Adolescent Health Trailblazers: Teen Driving

The Injury Center contributes to CDC's comprehensive, coordinated approach to improving adolescent health by sponsoring and conducting research and program activities to reduce injuries and deaths related to teen driving.

CHOOSE RESPECT Campaign

Pilot testing begins for CHOOSE RESPECT, a communication campaign targeting ages 11–14 years. It promotes healthy relationships by demonstrating positive, respectful messages and helps youth recognize and avoid dating abuse. Launch is scheduled for spring 2006.

Public Health Injury Surveillance and Prevention Program

Funding for core state injury control and prevention programs and traumatic brain injury programs is combined to strengthen collaboration and programs. This approach funds more states.

Falls Prevention Action Plan

CDC helps develop *Falls Free: Promoting a National Falls Prevention Action Plan* that outlines strategies to reduce fall dangers for older adults and addresses barriers to a national falls prevention initiative.

Heads Up: Concussion in High School Sports

CDC and partners develop and widely distribute a tool kit for coaches to help them educate athletes, athlete's parents, and others about preventing, recognizing, and managing sports-related concussion.

Injury in Asia

Injury Center staff partner with The Alliance for Safe Children to address the injury problem in Asia. Researchers examine data about childhood injuries and economic indicators related to injury in China and Thailand and engage Thailand's health ministry in discussions about capacity building for injury prevention.

Prehospital Trauma Care

CDC helps the World Health Organization (WHO) develop *Prehospital Trauma Care Systems*, a manual focusing on promising interventions and components of prehospital trauma care, particularly those that require minimal training and resources. CDC and WHO host an expert meeting about prehospital trauma care to coincide with the release of the report.

Data for Injury Prevention and Control

Many Americans do not understand the magnitude of the injury problem in this country. Data allow us to show how many people are injured each year and how many die or suffer permanent disabilities as a result of those injuries. Data show us where the biggest injury problems are so we can best focus our resources. And data let us know whether our efforts to prevent injuries are effective. CDC obtains injury data from a number of sources and shares the data through several channels.

Data Sources

CDC obtains data from several federal- and state-run systems that routinely capture information about injuries and deaths. Data also come from surveys conducted by staff and partners to obtain information about particular injuries or conditions. Examples of these data sources follow.

Behavioral Risk Factor Surveillance System

The Behavioral Risk Factor Surveillance System (BRFSS) monitors risk behaviors associated with the leading causes of injury and death among Americans 18 and older. The survey, conducted by the states, consists of standard questions CDC developed to facilitate state-by-state comparisons. Injury-related data in BRFSS include falls among older adults, seat belt use, alcohol-impaired driving, and firearm storage. CDC has also developed two optional modules to help states better assess the problem of intimate partner violence, sexual violence, and resulting injuries. BRFSS data can be analyzed by age, race and ethnicity, income level, and education.

Central nervous system surveillance: traumatic brain injury

As early as 1989, CDC began promoting the development of a multistate traumatic brain injury (TBI) surveillance system. The surveillance system is used to assess the extent of injury among individuals with a TBI; to identify high-risk populations and examine trends; to guide development, implementation, and evaluation of prevention and control programs; to prioritize the distribution of TBI resources; and to build a foundation for research and prevention of secondary conditions (e.g., depression and alcohol abuse). CDC developed two guides to help states collect, format, evaluate, and submit TBI surveillance data. The *Guidelines for the Surveillance of Central Nervous System Injury* ensured that the multistate TBI surveillance

system generated consistent, valid, and timely information (Thurman et al. 1995). Later, this information was updated and compiled into the *Central Nervous System Injury Surveillance Data Submission Standards, 2002* (Marr and Coronado 2004). Though developed for participating states, these guides are also a resource for states conducting TBI surveillance independent of the CDC system.

Fatality Analysis Reporting System

The Fatality Analysis Reporting System (FARS), managed by the National Highway Traffic Safety Administration, contains data about all fatal traffic crashes on public roadways within the 50 states, the District of Columbia, and Puerto Rico. FARS provides descriptions of each fatal crash reported, with more than 100 coded data elements that characterize the crash, the vehicles, and the people involved.

National Crime Victimization Survey

Run by the Bureau of Justice Statistics, part of the U.S. Department of Justice, the National Crime Victimization Survey provides representative data about the frequency, characteristics, and consequences of crime in the United States, including violent crimes such as rape, physical and sexual assault, and homicide. Survey data include type of crime; time and location of the crime; relationship between victim and offender; characteristics of the offender; consequences of the victimization; whether the crime was reported to the police and reasons for reporting or not reporting; and offender use of weapons, drugs, or alcohol. Basic demographic information is also included.

National Electronic Injury Surveillance System—All Injury Program

The National Electronic Injury Surveillance System—All Injury Program (NEISS–AIP), operated by the U.S. Consumer Product Safety Commission (CPSC), provides injury data from inner city, urban, suburban, rural, and children's hospitals. Originally, NEISS collected data only about nonfatal injuries related to consumer products and recreational activities. In July 2000, through a cooperative effort between CPSC and CDC, NEISS–AIP began collecting data about all nonfatal injuries treated in hospital emergency departments. CDC uses NEISS–AIP data to generate estimates of nonfatal injuries in the United States and to guide decisions and policies about injury prevention and control.

National Hospital Discharge Survey

Each year, the National Hospital Discharge Survey, administered by CDC's National Center for Health Statistics (NCHS), provides information about persons who survive injuries and are discharged from inpatient hospital care. NCHS gathers data annually from about 270,000 inpatient records acquired from a national sample of about 500 hospitals. Data include patient's age, sex, race, ethnicity, marital status, and expected sources of payment. Patient data also includes diagnosis, length of hospital stay, procedures performed, and condition at the time of discharge.

National Uniform Crime Reports

More than 17,000 city, county, and state law enforcement agencies voluntarily participate in the nationwide Uniform Crime Reports system, managed by the U.S. Federal Bureau of Investigation. From this system, CDC gets important information about violent crimes—rapes, physical and sexual assaults, and murders—committed in this country. Data can be broken down by geographic areas, municipalities of varying population sizes, and specific cities.

National Violent Death Reporting System

Currently, 17 states are part of the National Violent Death Reporting System (NVDRS). These states gather, share, and link state-level data to gain a more accurate understanding of violence. The system includes data collected from medical examiners, coroners, police, crime labs, and death certificates.

National Vital Statistics System

Each state must send information about deaths that occur within its borders to CDC's National Center for Health Statistics, which manages the National Vital Statistics System. For each death—including those caused by injuries and violence—the system contains information about the decedent's age, sex, race, ethnicity, education level, and cause of death.

Youth Risk Behavior Surveillance System

The Youth Risk Behavior Surveillance System (YRBSS) monitors health-risk behaviors among the nation's 9th-through 12th-grade students. State and local departments of education and health conduct this self-administered survey biennially, and CDC assists in analyzing the data. The survey includes several injury-related behaviors: seat belt use, driving after drinking alcohol, riding with a driver who has been drinking, wearing bicycle and motorcycle helmets, carrying a weapon to school, being in a physical fight, experiencing dating violence and forced sexual intercourse, and attempting suicide or having suicidal thoughts. Data can be analyzed by sex, grade in school, and race and ethnicity.

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Data Sharing

To help injury professionals, policy makers, and researchers better understand the injury problem and develop strategies to reduce it, CDC shares injury data through a variety of means. Following are examples of communication channels.

Injury Maps

Launched in 2002, Injury Maps is an interactive Web application that creates maps from injury mortality rates. Injury Maps enables injury mortality rates to be mapped, displayed in an easy-to-interpret format, and compared across states and counties. The appearance of a map can be tailored by changing colors, zooming in on specific areas, or adding features such as major cities and towns, highways, bodies of water and Congressional districts. The maps are printable and downloadable. To access Injury Maps, visit www.cdc.gov/ncipc/maps.

State Injury Profiles

CDC's *State Injury Profiles* give policy makers and health care workers an easy way to look at statistics about injuries to help them make informed decisions about where to allocate limited prevention resources. Maps and graphs in the *Profiles* show each state's death rates from motor vehicle crashes, falls, poisoning, drowning, suffocation, fires and burns, suicide, homicide, traumatic brain injuries, and injuries related to firearms. The graphics show how each state compares with others in the nation and with mortality rates in the United States as a whole. The *Profiles* also contain a table showing the ten leading causes of death for each state and for the United States overall. In 2001, the Injury Center began offering a free CD-ROM with data from the *State Injury Profiles* in slide presentation format to facilitate communication about injuries. To access the *Profiles* on the Web, go to www.cdc.gov/ncipc/StateProfiles/index.htm.

WISQARS™

WISQARS (pronounced “whiskers”), the Web-based Injury Statistics Query and



Reporting System,

is an interactive database of injury morbidity and mortality data. It offers prompt, customized reports about both unintentional and violent injuries, including leading causes of death reports, leading causes of nonfatal injury reports, and years of potential life lost reports. Data are updated each year in the fall. Tutorials, frequently asked questions, and a help file ensure that users obtain the data they need. To use WISQARS, go to www.cdc.gov/ncipc/wisqars.

Downloadable leading causes charts

To assist partners in communicating the threat of injury to public health, CDC's Injury Center has released several charts on its website. The charts show ten leading causes of death and nonfatal injury, highlighting both unintentional injury and violence. Available in several file formats, the charts can be used in slide presentations, Web pages, and print documents. To download a chart, go to www.cdc.gov/ncipc/osp/charts.htm.

A Note About CDC's Injury Data

As you read the *CDC Injury Fact Book*, you will note that data are 2 to 3 years old. These data were the most recent available when this book was first developed. CDC must compile injury data from numerous sources, verify those data, and prepare data in a way that is useful and meaningful for the public. While this process may result in lag time between data collection and data release, it ensures that CDC provides the public with accurate, reliable information.

Please visit CDC's Injury Center website for current data: www.cdc.gov/injury.

Capacity Building and Surveillance

Surveillance is key to developing effective public health programs. By knowing the magnitude of a problem and the affected populations, resources can be directly applied and capacity can be built to control or prevent the injury or violence-related problem. One way to build capacity and to strengthen the infrastructure is by integrating programs, thereby leveraging resources and increasing efficiency through coordinated efforts.

Public Health Injury Surveillance and Prevention Program

In 2005, CDC began funding the Public Health Injury Surveillance and Prevention (PHISP) Program. The PHISP Program is designed to combine the Integrated Core Injury Prevention and Control Program with specialized TBI programs. Funding for the specialized TBI programs is awarded to certain states in varying combinations (see map for 2005-funded programs).

This departure from traditional single-program funding increased the number of states receiving core injury funding from 28 to 30; states receiving funding

to conduct basic, electronic TBI surveillance increased over 100%—from 12 to 30.

The PHISP Program funding makes it possible to integrate the “core” Integrated Core Injury Prevention and Control Program (which includes basic TBI surveillance) with specialized TBI programs:

■ Integrated Core Injury Prevention and Control (ICIPC) Program.

The “core” ICIPC Program systematically collects information about TBIs, drownings, fire-related injuries, motor vehicle injuries, poisonings, homicides, suicides, and injuries resulting from mass casualty events and then analyzes these data to direct future injury prevention plans. The ICIPC Program also focuses on building capacity and strengthening essential infrastructure support. Through this program, CDC encourages states to build coalitions with partners from academic, nonprofit, private, local government, and professional organizations.

■ Traumatic Brain Injury Extended Surveillance (TBIES) Program.

The TBIES Program supports efforts to provide expanded information on the incidence of TBI. It provides centralized, statewide electronic surveillance of TBI using linked and unduplicated data from hospital discharge and vital statistics databases.

■ Traumatic Brain Injury Emergency Department (TBIED) Surveillance Program.

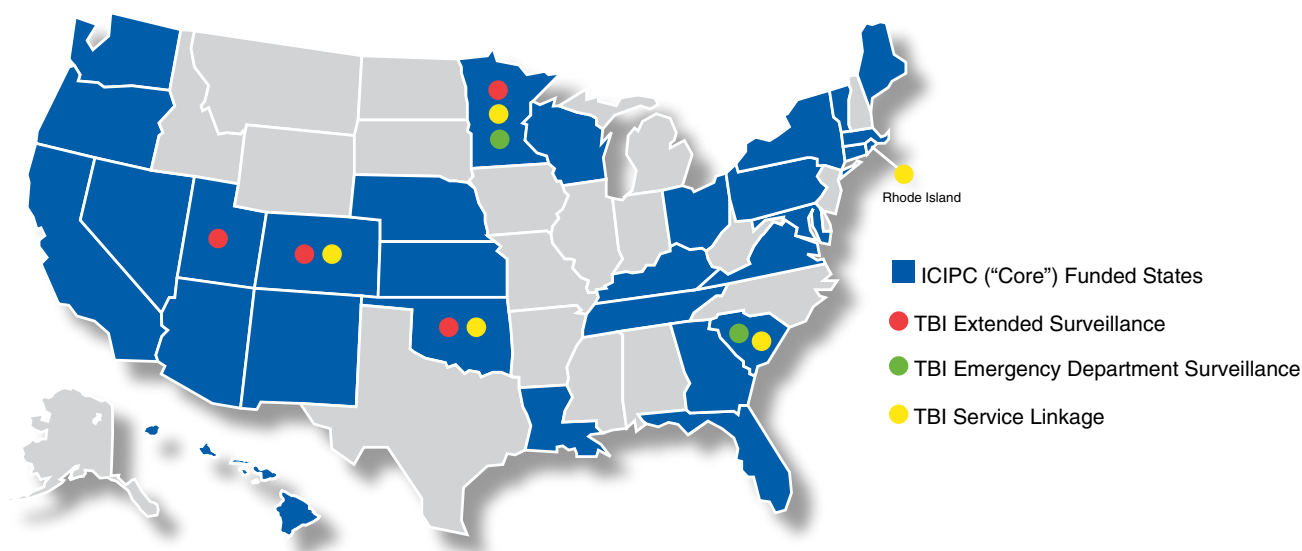
In addition to performing basic electronic surveillance, the program supports efforts to provide information on the incidence of TBI treated in the emergency department.

■ Traumatic Brain Injury Service Linkage (TBISL) Program.

Supports efforts to link individuals with TBI to information about services.

The PHISP Program is one of many ways in which CDC helps fulfill its Healthy People 2010 responsibilities to prevent injury and violence while leveraging resources and increasing efficiency. For more information about the PHISP Program, log on to www.cdc.gov/injury.

2005 Recipients of Public Health Injury Surveillance and Prevention (PHISP) Program Funding



Partners in Prevention

CDC's Injury Center could not do its job without its partners. They are essential at every stage in the public health approach—collecting data about injuries, sharing insight about risk factors and strategies for prevention, developing and testing programs to prevent and control injury, and helping effective programs reach people at risk. CDC's Injury Center works with private industry, other federal agencies, state and local agencies and health professionals, national nonprofit organizations, academic organizations and institutions, and international agencies to achieve its goal of preventing injuries and resulting deaths and disabilities.

The list of partners found in this section is far from exhaustive. It is merely a sample of the wide variety of organizations and agencies with which we work closely. While we value our relationships with all our partners, there simply is not space to list them all in the *CDC Injury Fact Book*.

“Many of the nearly 50 million injuries that occur each year in the United States are preventable . . . we need greater recognition of the value of our prevention efforts . . . the benefits of preventing motor vehicle crashes, falls, residential fires, childhood abuses, and other injuries are significant.”

NCIPC Director, Dr. Ileana Arias

CDC works with many federal agencies to address injury issues that span all life stages. Below are examples of activities underway with some of the Injury Center’s federal partners.

Defense and Veterans Brain Injury Center

The Defense and Veterans Brain Injury Center (DVBIC) works to ensure that military personnel and veterans with brain injury receive the best possible evaluation, treatment, and follow-up. CDC’s Injury Center is collaborating with DVBIC to study outcomes of traumatic brain injury (TBI) among military personnel using methods developed through CDC-funded TBI follow-up studies.

Health Resources and Services Administration

CDC’s Injury Center recently partnered with the Health Resources and Services Administration (HRSA) to support the expansion of the Institute of Medicine’s Future of Emergency Care in the U.S. Health System study. This expansion will include focused assessments of pediatric emergency care and issues relating to pre-hospital emergency medical services. HRSA is also a partner in efforts to improve how states use traumatic brain injury data.

Indian Health Service

The Indian Health Service (IHS) is a valuable partner in efforts to prevent injuries and deaths among Alaska Natives and Native Americans. For example, the IHS partnered with CDC to research Native American childhood injuries and disseminate findings throughout the IHS and among tribes.

National Highway Traffic Safety Administration

In its efforts to prevent transportation-related injuries and deaths, CDC works closely with the National Highway Traffic Safety Administration (NHTSA), part of the U.S. Department of Transportation. NHTSA and CDC jointly published strategies to improve bicycle safety and child pedestrian injuries. The organizations also collaborated for World Health Day 2004 to organize and implement a comprehensive strategy for promoting road safety in the United States. Joint research projects have involved graduated licensing for teens, alcohol-impaired driving, and systematic reviews of what works to prevent motor vehicle crashes and related deaths. CDC and NHTSA are collaborating with the Task Force on Community Preventive Services to summarize what is known about the effectiveness of interventions to reduce alcohol-impaired driving and increase seat belt use (available at www.thecommunityguide.org). NHTSA also offers vital data about motor vehicle crashes and related deaths.

U.S. Consumer Product Safety Commission

The U.S. Consumer Product Safety Commission (CPSC) has long been an important partner in injury prevention. CPSC manages the National Electronic Injury Surveillance System (NEISS), which collects vital information about nonfatal injuries. Recently, CPSC collaborated with CDC and the U.S. Food and Drug Administration (FDA) to determine the feasibility and usefulness of enhancing NEISS for monitoring adverse drug events. Based on the feasibility and utility demonstrated by this project, CDC, CPSC, and FDA now conduct ongoing adverse drug event surveillance (“medication injury monitoring”) in 64 NEISS–All Injury Program hospitals. Additionally, CPSC helped develop a program to prevent fire- and fall-related injuries among older adults, and it is one of several agencies evaluating current and prototypic smoke alarm technologies.

U.S. Department of Education

Since 1992, CDC’s Injury Center has worked with the Department of Education (ED) to conduct a

national study of school-related violent deaths. This study allows public health officials to monitor trends in violence that occur in and around our nation’s schools. CDC and ED have also launched a social and character development research program to evaluate the effectiveness of interventions designed to promote positive social and character development, increase positive behaviors, and reduce antisocial behaviors among elementary school children. In addition, ED’s National Institute of Disability and Rehabilitation Research (NIDRR) funds the Traumatic Brain Injury Model Systems (TBIMS). The 17 TBIMS centers now funded are involved in a prospective, longitudinal multicenter effort to examine the course of recovery and outcomes following TBI. CDC’s Injury Center funds a collaborative study with NIDRR to compare TBI Model Systems data with population-based, CDC-funded surveillance and outcomes data in South Carolina.

U.S. Department of Justice

CDC works with the U.S. Department of Justice (DOJ) on various injury and violence issues. For example, DOJ was one of the two agencies CDC worked with to conduct its national school violence study. DOJ also cosponsored the 2002 and 2004 National Sexual Violence Prevention Conferences and the National Violence Against Women Survey, resulting in estimates of stalking, rape, and physical assault among women in the United States.

U.S. Fire Administration

CDC works with the U.S. Fire Administration (USFA), now part of the U.S. Department of Homeland Security (DHS), to address fire-related injuries and deaths in America. This agency is one of several partners working with the Injury Center to evaluate the performance of various smoke alarms. Additionally, through an interagency agreement, CDC evaluates outcomes of USFA-funded fire prevention programs.

State and Local Agencies

CDC relies heavily on state and local agencies. These agencies provide critical data about injuries, offer important perspectives on how injuries affect communities nationwide, and help reach communities in ways that CDC, as a federal agency, cannot.

State Health Departments

CDC has cooperative agreements with many state health departments. With CDC funding, states collect data about topics such as traumatic brain injuries, violence against women, and emergency department visits for injuries. States also conduct and evaluate programs to prevent sexual violence, distribute smoke alarms, promote use of bicycle helmets, and implement trauma care systems.

State-funded Programs

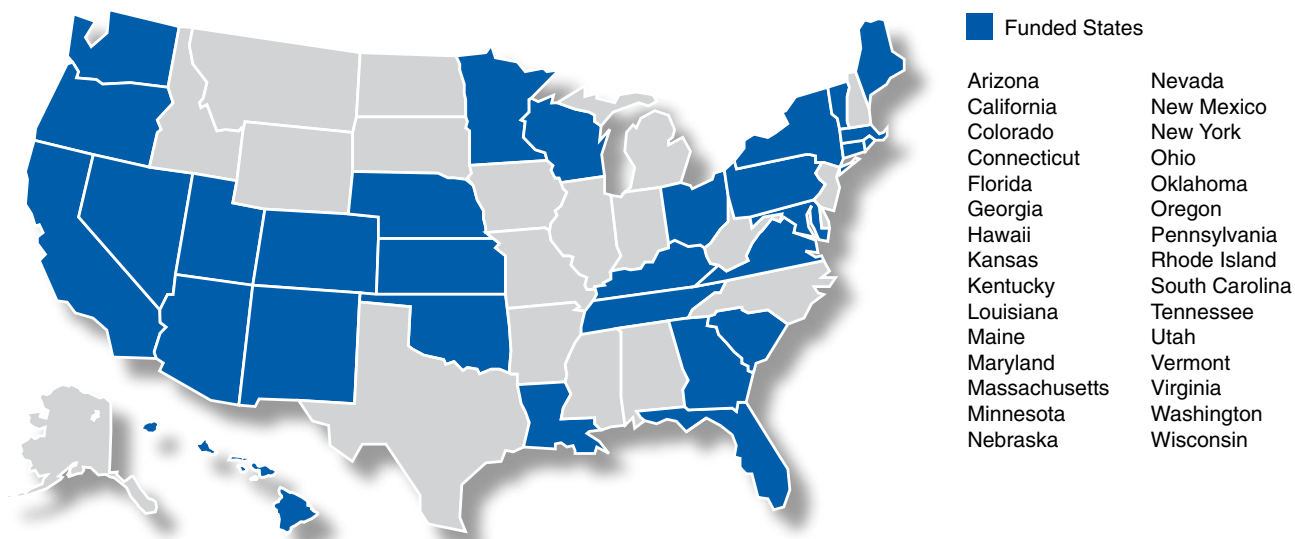
Injury is a leading killer in all 50 states, but injury problems differ among the states. Variations in geography, weather conditions, and populations cause some states to incur injury issues not experienced by the rest of the country. To address these issues, CDC funds state health departments to systematically collect information about TBIs, drownings, fire-related injuries, motor vehicle injuries, poisonings, homicides, suicides, and injuries

resulting from mass casualty events and then analyzes these data to direct future injury prevention plans. Thirty states receive Integrated Core Injury Prevention and Control (ICIPC) Program funding. The funding helps states strengthen infrastructure and build capacity by developing five core components of model state injury programs:

- Collect and analyze data;
- Provide technical support and training to communities conducting injury programs;
- Coordinate and collaborate in injury prevention activities;
- Design, implement, and evaluate programs to prevent injury; and
- Inform public policy that supports injury prevention.

To date, most funded states have established offices of injury prevention and control. Most states have also formed, and are actively using, injury community planning groups to develop and prioritize injury plans. They have built partnerships to improve coordination and collaboration, and their health agencies are paying greater attention to injury as a critical public health problem. State accomplishments and program profiles are available on the Injury Center's website.

2005 Recipients of Integrated Core Injury Prevention and Control (ICIPC) Program Funding



Organizations for State and Local Health Professionals

CDC works closely with organizations representing state and local public health professionals. A sampling of those organizations follows.

Association of State and Territorial Health Officials

Association of State and Territorial Health Officials (ASTHO), which represents the chief health officials for all states, U.S. territories, and the District of Columbia, formulates and influences public health policy and ensures excellence in state-based public health practice. ASTHO supports initiatives to improve states' abilities to develop, implement, and evaluate injury prevention efforts.

Council of State and Territorial Epidemiologists

The Council of State and Territorial Epidemiologists (CSTE) and CDC work in partnership to improve the public's health by supporting the efforts of epidemiologists who work at state and local levels. CSTE and CDC promote the use of epidemiologic data to guide public health practice and improve health. CSTE has also consulted with CDC about the development and implementation of the National Violent Death Reporting System (NVDRS). This partnership provides a valuable link for CDC

to inform CSTE membership about NVDRS through the Council's newsletters, fact sheets, and position statements.

National Association of County and City Health Officials

National Association of County and City Health Officials (NACCHO) provides information, education, research, and technical assistance to more than 3,000 local health departments. Its members work to ensure that local public health systems have the capacity to effectively address health and safety issues, including those related to injury and violence.

National Association of State Emergency Medical Service Directors

The National Association of State Emergency Medical Service Directors (NASEMSD) provides vision and leadership for developing and improving EMS systems and national EMS policy. CDC supports NASEMSD to explore key indicators of EMS system readiness in the states and territories. This project comprises a series of surveys examining three areas: involvement of state EMS offices in bioterrorism grant and planning efforts; programmatic involvement of state EMS with prevention programs; and state EMS funding.

National Association of State Head Injury Administrators

The National Association of State Head Injury Administrators (NASHIA) helps state governments promote partnerships and build systems to meet the needs of individuals with brain injury and those of their families. CDC's Injury Center works with NASHIA to coordinate traumatic brain injury (TBI) surveillance activities and service linkage projects with state programs providing TBI services.

State and Territorial Injury Prevention Directors Association

The State and Territorial Injury Prevention Directors Association (STIPDA) is a national organization with a primary mission to promote, sustain, and enhance the ability of state, territorial, and local public health departments to reduce death and disability associated with injuries. As such, STIPDA is positioned to support the mission of CDC's Injury Center. The Injury Center supports STIPDA to develop models and standards for injury and violence prevention programs; to conduct systematic, comprehensive reviews of injury and violence prevention capacity in state health departments; and to provide technical assistance for state injury and violence prevention programs and staff.

National Nonprofit Organizations

CDC works with many national nonprofit organizations to reach various audiences such as public health professionals, health care providers, and communities at risk for injury. Some of the organizations CDC works with follow.

American Academy of Pediatrics

CDC's Injury Center provides a liaison to the American Academy of Pediatrics' (AAP) Committee on Injury and Poison Prevention and Committee on Child Abuse. CDC contributes scientific expertise to help AAP develop policies about child maltreatment and childhood injuries.

American Automobile Association (AAA) Foundation for Traffic Safety

CDC works with the Office of Traffic Safety Policy in the AAA national office in Washington, D.C., to evaluate traffic safety interventions and to promote research in a broad spectrum of traffic safety issues such as aging and mobility, child passenger safety, teen driving, and impaired driving. CarFit, an AAA public awareness program, teaches seniors how to adjust seats, mirrors, seat belts, etc., so their cars better fit them. The program also gives seniors access to community resources. CDC also supports innovative focus group research on Latinos' use of seat belts. This research explores and measures multiple dimensions of seat belt use by Hispanics living in the United States.

American College of Emergency Physicians

The American College of Emergency Physicians (ACEP) supports quality emergency medical care and promotes the interests of emergency physicians. CDC supports ACEP through the Terrorism Injuries: Information, Dissemination and Exchange (TIIDE) cooperative agreement, which promotes collaboration between national organizations of professionals in emergency care and state and local health departments that will be critical in the event of a terrorist attack or other mass casualty event. CDC also supported ACEP's 2004 Emergency Medical Services Week activities.

American College of Surgeons

The American College of Surgeons (ACS) is a scientific and educational association of surgeons that was founded to improve the quality of care for the surgical patient by setting high standards for surgical education and practice. CDC supports ACS to provide national representative samples for Level 1 and Level 2 trauma centers through the ACS National Trauma Data Bank (NTDB). CDC is assisting ACS in planning and developing a national and regional probability sample for the NTDB to generate population-based rates that will help uniformly assess improvement in care of the injured.

American Psychological Association

The American Psychological Association recently launched ACT (Adults and Children Together Against Violence), a national media campaign aimed at giving parents and other caregivers of young children the tools they need to prevent violence. CDC is evaluating the dissemination of the program.

American Public Health Association

The American Public Health Association (APHA) is an association for local, state, and federal public health workers across the country. CDC has a long-standing relationship with APHA and supports it to develop a curriculum outline about the interface of the emergency medical system and public health. The outline is a first step toward professional training that integrates public health and emergency service practices that will enhance day-to-day operations and increase readiness in disaster situations.

American Trauma Society

CDC supports the American Trauma Society (ATS) Trauma Information Exchange Program. Through this program, ATS collects data from trauma centers and improves access to such data. CDC funds ATS through the TIIDE cooperative agreement, which promotes collaboration between national organizations of professionals

in emergency care and state and local health departments. Such collaboration will be critical in a terrorist attack or mass casualty event.

Brain Injury Association of America

CDC's Injury Center works with the Brain Injury Association of America (BIAA) to promote education and research about traumatic brain injuries. The Injury Center serves on BIAA's task force and has funded its pilot study for evaluating the development of a national brain injury information center. The "one-call" information center is being piloted in three states (Michigan, Minnesota, and Mississippi). People in these states who call the BIAA's toll-free number will be linked automatically to their local Brain Injury Association for confidential and individualized brain injury resources in their state.

Home Safety Council

CDC works with the Home Safety Council (HSC), a national nonprofit organization dedicated to preventing home-related injuries, on issues about injury prevention. HSC and CDC supported the development of the National Council on Aging's *Falls Free: Promoting a National Falls Prevention Action Plan*, which addresses the challenges and barriers related to a national falls prevention initiative and outlines key strategies and ways to help reduce fall dangers for older adults. HSC also supported the 2005 Injury Center conference, "Injury and Violence in America: Meeting Challenges, Sharing Solutions."

MetLife Foundation

Metropolitan Life Insurance Company (MetLife) established its Foundation in 1976 to support civic, educational, cultural, and health organizations. In 2004, through a partnership of the CDC Foundation and the MetLife Foundation, two CDC brochures were updated and translated into Spanish and Chinese: *What You Can Do to Prevent Falls* and *Check for Safety: A Home Fall Prevention Checklist for Older*

Adults. New posters that promote fall prevention activities were also created and are available in English, Spanish, and Chinese. See www.cdc.gov/ncipc/pub-res/toolkit/brochures.htm.

National Alliance of Children's Trust and Prevention Funds

The National Alliance of Children's Trust and Prevention Funds initiates and engages in national efforts to prevent child abuse and neglect. These efforts include promoting and supporting services, laws, practices, and attitudes that enable families to provide their children with a safe, healthy, and nurturing childhood. CDC is working with the Alliance to expand its leadership role in preventing child maltreatment; to foster collaborations that respond to emerging policy and program issues; and to develop a plan to guide prevention activities.

National Association of Emergency Medical Service Physicians

The National Association of EMS Physicians (NAEMSP) is an organization of physicians and other professionals partnering to provide leadership and foster excellence in out-of-hospital emergency medical services. CDC's Injury Center supports NAEMSP through the Terrorism Injuries: Information Dissemination and Exchange cooperative agreement, which promotes collaboration between national organizations of professionals in emergency care and state and local health departments. Such collaboration would be critical in the event of a terrorist attack or other mass casualty event.

National Fire Protection Association

CDC and the National Fire Protection Association (NFPA) have collaborated for years to prevent injuries from residential fires. Together with the U.S. Consumer Product Safety Commission and other partners, CDC's Injury Center and NFPA developed Remembering When: A Fire and Fall Prevention Program for Older Adults. CDC evaluated the effectiveness of the Remembering When program, leading to a revision that CDC and NFPA were developing in 2005.

National Safety Council

In collaboration with the National Safety Council (NSC), CDC is summarizing evidence of the effectiveness of graduated drivers licensing (GDL) systems for young, beginning drivers; estimating the cost of off-the-job injuries in America; reviewing CDC brochures on older adult falls; and creating fall prevention materials. CDC also works with NSC's Research and Statistics Services Department to rapidly provide NSC with emerging results from CDC injury research. A series of articles in the *Journal of Safety Research* will feature cutting-edge CDC research on injury and violence prevention.

Parents Anonymous

Parents Anonymous is a national child abuse prevention organization dedicated to strengthening families and building caring communities that support safe and nurturing homes for children. CDC is working with Parents Anonymous to expand its leadership role in preventing child maltreatment; to foster collaborations that respond to emerging policy and program issues; and to develop a plan to guide prevention activities.

Prevent Child Abuse America

Prevent Child Abuse America works to prevent child abuse and neglect in the United States. The organization took part in CDC's expert meeting to develop a plan to prevent child maltreatment. When the plan was completed, it was shared with policy makers, an action that resulted in the allocation of funds for research and programs to prevent child maltreatment.

SAFE KIDS Worldwide

CDC and SAFE KIDS have conducted three projects to prevent injury among children. SAFE KIDS implemented and evaluated a drowning prevention program in two states with communities that have child drowning rates higher than the national average. SAFE KIDS, with support from CDC, implemented

a program to reduce injuries among children living in low-income housing in 10 communities across the United States and developed a low-literacy home safety brochure and a home safety PowerPoint presentation for distribution via SAFE KIDS coordinators. Additionally, SAFE KIDS was one of several cosponsors for the Panel to Prevent Pedestrian Injuries, a discussion that resulted in published strategies to improve safety for child pedestrians. CDC's Injury Center serves on the SAFE KIDS Advisory Committee.

Society for Public Health Education

CDC's Injury Center works with the Society for Public Health Education (SOPHE) to provide training in injury prevention and behavioral science. A SOPHE website on behavioral science and injury emphasizes the links between behavioral science, health education, and injury and violence prevention. It offers injury facts, tips for implementing and evaluating interventions, links to CDC-funded injury control research, and information about opportunities for research funding. In addition, CDC supports the SOPHE/CDC Student Fellowship in Injury and Violence Prevention, an annual program for graduate students conducting injury research under the supervision of faculty mentors. SOPHE, comprised of health education professionals and students, stimulates research, supports performance standards, advocates policy and legislation, and develops standards for professional development in health education and health promotion.

Stop It Now!

Stop It Now! is a national, public health-based organization working to prevent and ultimately eradicate child sexual abuse. Through public education, policy advocacy, and research and evaluation, STOP IT NOW! calls on abusers and potential abusers to stop their abusive behavior and seek help. CDC is working with Stop It Now! to determine risk and protective factors for perpetration of sexual abuse and to identify the immediate and long-term health consequences of child sexual abuse.

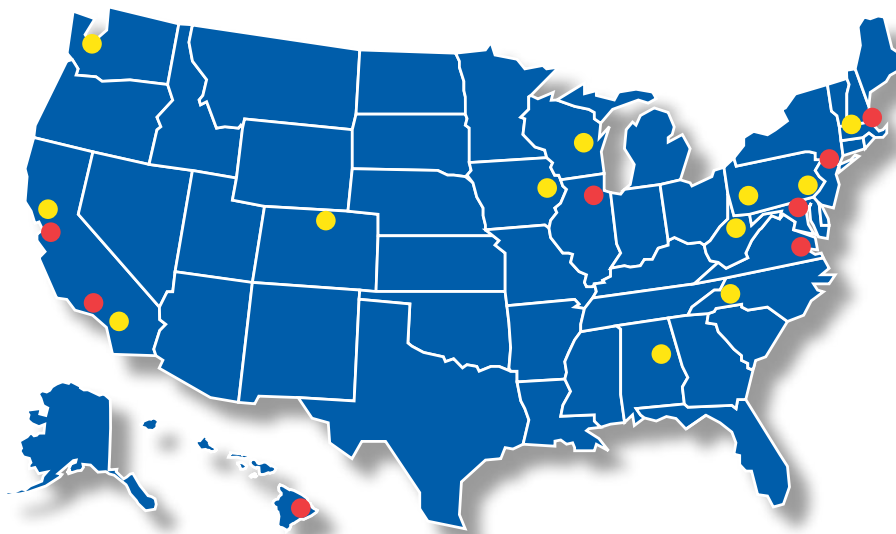
Academic Institutions

Academic Centers of Excellence
 CDC's Injury Center funds eight National Academic Centers of Excellence (ACE) on Youth Violence Prevention at colleges and universities throughout the United States. The Centers focus on the complex problem of youth violence by fostering multi-disciplinary and multi-sectoral interactions that can stimulate scientific creativity, speed new developments in youth interpersonal violence research and practice, and hasten translation of knowledge into health and community practice. Centers actively foster an environment conducive to reciprocally beneficial collaborations among health scientists, social scientists, and the affected communities with the common goal of reducing youth interpersonal violence. The programs

can be viewed at www.cdc.gov/ncipc/res-ops/ACE/ace.htm.

Injury Control Research Centers
 CDC funds 12 Injury Control Research Centers (ICRCs) to conduct research in three core phases of injury control: prevention, acute care, and rehabilitation. ICRCs serve as training centers and information centers for the public. Research design in these centers is interdisciplinary and incorporates medicine, engineering, epidemiology, law, criminal justice, behavioral and social sciences, biostatistics, public health, and biomechanics. Full descriptions of current research and education projects conducted by the ICRCs may be accessed at www.cdc.gov/ncipc/profiles/icrcs/default.htm.

Examples of CDC-funded Programs for Injury Prevention and Control



● **Injury Control Research Centers** conduct research in prevention, acute care, and rehabilitation and serve as training and information centers.

Colorado Injury Control Research Center (CICRC)

Harborview Injury Prevention and Research Center (HIPRC)

Harvard Injury Control Research Center (HICRC)

Injury Research Center at the Medical College of Wisconsin (IRC-MCW)

Johns Hopkins Center for Injury Research and Policy (CIRP)

San Francisco Injury Center for Research and Prevention (SFIC)

Southern California Injury Prevention Research Center (SCIPRC)

University of Alabama at Birmingham Injury Control Research Center (UAB-ICRC)

University of Iowa (UI) Injury Prevention Research Center (IPRC)

University of North Carolina Injury Prevention Research Center (UNC IPRC)

University of Pittsburgh Center for Injury Research and Control (CIRCL)

West Virginia University Injury Control Research Center (WVU ICRC)

● **National Academic Centers of Excellence (ACE) on Youth Violence** were established in 2000. These universities and colleges foster collaboration between university researchers and communities to address the public health problem of youth violence. Universities and colleges that receive ACE funding may vary from year to year. The following centers were funded in 2005.

Columbia University

University of California-Riverside

Harvard University

University of Hawaii

Johns Hopkins University

University of Illinois-Chicago

University of California-Berkley

Virginia Commonwealth University

Academic Organizations

CDC works with academic organizations to ensure that universities' curricula and research address injury prevention issues. Some academic partners follow:

Association of Schools of Public Health

CDC's collaboration with the Association of Schools of Public Health (ASPH) led to the development of critical partnerships between ASPH and other injury and violence organizations. For example, the Family Violence Prevention Fund helps ASPH train additional faculty in violence prevention. Through a cooperative agreement (2001–2003), CDC funded ASPH to facilitate opportunities for injury and violence prevention research, teaching, and practice in schools of public health so that public

health students and professionals could be more aware of the importance of this public health problem. In 2002–2003, ASPH inventoried the 33 accredited schools of public health to assess each school's capacity to advance the injury and violence prevention field. This inventory will be used by the schools of public health to help bolster their injury and violence training and research programs.

Society for Advancement of Violence and Injury Research

SAVIR (formerly the National Association of Injury Control Research Centers, NAICRC) is dedicated to the improvement of injury and violence control research in prevention, acute care, and rehabilitation programs. SAVIR offers its institutional and professional members, and those

they serve, consultation, education, training, research dissemination, program development, and evaluation. SAVIR works to advance the public's understanding of the benefits of injury and violence control research. For more information, visit www.savirweb.org.

Cross-cutting Partnerships

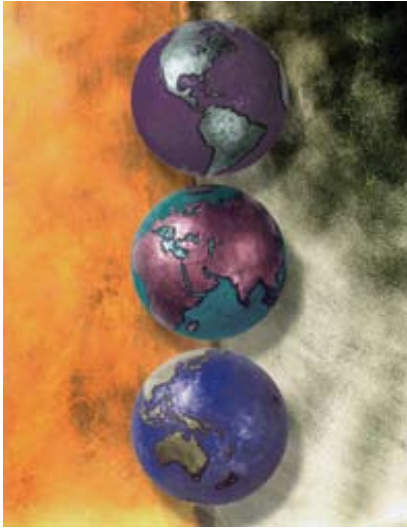
CDC partners with groups that represent a variety of interests and that work for the common goal of injury prevention. The following is one example.

SafeUSA

SafeUSA, a nonprofit organization in Washington, D.C., is an alliance of public agencies (including CDC's Injury Center) and private organizations whose programs include research, service, training, communications, and policy development related to injury and violence prevention. Representatives of these organizations assemble regularly to exchange information and to develop strategies that build support for injury and violence prevention.



International Agencies



Because injuries and violence occur worldwide, not just in America, CDC's injury partners extend beyond our nation's borders. Recent collaborations with international partners are described below.

Pan American Health Organization

CDC works with the Pan American Health Organization (PAHO) on the Inter-American Coalition for the Prevention of Violence (IACPV), which acts as a catalyst for the prevention of violence in the Americas. PAHO assists CDC to strengthen country and municipality capacity in injury surveillance and to establish policies and integrated programs that prevent violence and road traffic injuries. PAHO and CDC collaborated on a meeting about Road Safety at the United States–Mexico Border, working with countries in Latin America and the Caribbean to develop a set of recommendations and action plans.

World Health Organization

In 2004, CDC worked closely with the World Health Organization (WHO) on the first *World Report on Road Traffic Injury Prevention*, the official launch of World Health Day celebrations “Road Safety is No Accident,” and the Injury Center’s U.S. campaign “Family Road Safety: Protect the Ones You Love.” The Injury Center works with WHO’s Department of Injury and Violence Prevention to develop and implement programs and policies on global injury and violence prevention. CDC assists WHO in surveillance, intervention development, training, evaluation, and dissemination. In 2002, WHO launched the first *World Report on Violence and Health* to raise awareness of violence as a global public health problem, to facilitate comparisons among nations, to summarize existing prevention strategies and policies, and to recommend future public health actions. More than 160 experts from around the world, including scientists from CDC, helped develop the report. Other projects include a five-year strategy for road traffic injury prevention, TEACH-VIP (a curriculum on injury and violence prevention), and coalition building to eliminate violence against women.

Injury—A Risk at Any Stage of Life

At every age, from our earliest days to our golden years, we are at risk for injury and the disability and death that can result. No age is a “safe” age when it comes to injuries and violence.

But the injuries and threats of violence that we face change as we age and enter different life stages. Common sense tells us—and research confirms—that the risks a toddler faces are not the same as the risks a grandmother faces.

CDC tracks and monitors the injuries and violence that occur at different life stages and examines factors related to those life stages that increase or decrease a person’s risk for injury and violence. With that information, we can tailor prevention programs to the needs, preferences, and life circumstances of particular age groups. By focusing on life stages, we can also forge partnerships that help us more effectively reach people in particular age groups.

Following is a brief overview of how injuries affect Americans in different age groups and how CDC addresses injury prevention and control at each life stage.

Injury—A Risk at Any Stage of Life



Infants and Toddlers (Ages 0–3)

- Nearly 3,100 children ages 3 and under died in 2002 from injuries (CDC 2004).
- For children under 1 year old, the leading cause of injury death is unintentional suffocation due to choking or strangulation (CDC 2004).
- Motor vehicle crashes are the leading cause of death for children ages 1 to 3 (CDC 2004). In 2003, one third of the children ages 4 and younger who died in motor vehicle crashes were riding unrestrained (NHTSA 2005).
- Children in this age group are at high risk for sustaining a traumatic brain injury (CDC 2004).
- Drowning is the second leading cause of injury death for children in this age group (CDC 2004). Children under age 1 most often drown in bathtubs, buckets, or toilets whereas toddlers most often drown in residential swimming pools (Brenner et al. 2001).
- In 2003, more than 1.8 million children under age 4 were nonfatally injured, and falls were the leading cause (CDC 2004).
- Child maltreatment by blunt trauma to the head or by violent shaking is a leading cause of head injury among infants and young children (Committee on Child Abuse and Neglect 2001).

Infants and young children are at greater risk for many injuries. This increased risk may be attributable to many factors. Children are curious and like to explore their environment. This characteristic may lead children to sample the pills in the medicine cabinet, play with matches, or venture into the family pool. Young children have limited physical coordination and cognitive abilities. This can lead to a greater risk for falls from bicycles and playground equipment and make it difficult for them to escape from a fire. And their small size and developing bones and muscles may make them more susceptible to injury in car crashes if they are not properly restrained.

Because babies and young children are so dependent on others and often cannot express themselves well verbally, they may be at higher risk for abuse or neglect. A baby or toddler who experiences abuse cannot tell someone about it, so the abuse may continue. And because of their small size, they can be seriously injured if hit, pushed, or shaken by an adult.

CDC is involved in many efforts to keep America's youngest children safe. The Injury Center supports programs to increase child safety seat use, prevent injuries related to residential fires, and prevent child maltreatment. Injury Center staff also works with partners to explore the roles that supervision and parenting play in preventing injuries.



Children (Ages 4–11)

- In 2002, nearly 2,300 children ages 4 to 11 died from injuries (CDC 2004).
- Motor vehicle injuries are the leading cause of death for this age group (CDC 2004).
- For children 4 to 7 years, belt-positioning booster seats reduce injury risk by 59% compared with seat belts alone (Durbin et al. 2001). Although restrained, only 37% ride in age-appropriate belt-positioning booster seats (Cody et al. 2002).
- Drowning is the second leading cause of injury-related death among children ages 4 to 11 (CDC 2004).
- In 2003, almost one quarter (23%) of children ages 5 to 9 who were killed in traffic crashes were pedestrians (NHTSA 2004a).
- Among children ages 4 to 11, homicide is the fourth leading cause of death, taking the lives of 250 children in 2002.
- Forty-two percent of homicide deaths in this age group were caused by firearms (CDC 2004).
- Nearly 3.2 million children ages 4 to 11 were nonfatally injured in 2003. Unintentional falls were the most common cause of injury (CDC 2004).

CDC's Injury Center staff is working to prevent injuries among this group by increasing the use of booster seats, encouraging parents to have their children ride in the back seat of motor vehicles, and promoting pedestrian safety. CDC is looking into the risk factors for child maltreatment, including child sexual abuse, and also is exploring prevention programs for child maltreatment.



Adolescents (Ages 12–19)

- Nearly 4.7 million adolescents were nonfatally injured in 2003; nearly 12,200 died from injuries in 2002 (CDC 2004).
- Motor vehicle crashes are the leading cause of death for adolescents ages 12 to 19 (CDC 2004).
- The risk for motor vehicle crashes is higher among 16- to 19-year-olds than in any other age group. Per mile driven, drivers in this age group are four times more likely than older drivers to crash (IIHS 2004).
- More than 18% of high school students in a 2003 survey reported rarely or never wearing seat belts; 12% reported drinking and driving; and 30% reported riding with a drinking driver in the month preceding the survey (Grunbaum et al. 2004).
- Traumatic brain injuries among this age group account for more than 240,000 emergency room visits, 36,000 hospitalizations, and more than 5,700 deaths each year (CDC 2004).

- Nearly 63,000 sports-related concussions occur annually in high school sports (Powell and Barber-Foss 1999).
- Homicide is the second and suicide is the third leading cause of death in this age group. Most homicides and about half of suicides involve a firearm (CDC 2004).
- In a 2003 survey, nearly 13% of high school students had been in a physical fight on school property at least once in the preceding year. More than 6% had carried a weapon at school in the month preceding the survey (Grunbaum et al. 2004).
- Adolescents 10 to 14 years of age have the highest rates of sports- and recreation-related injury (Gotsch et al. 2002).

CDC supports many programs to reduce injuries and violence among adolescents and teens. CDC now supports several activities to evaluate the effectiveness of graduated driver licensing (GDL) programs and to examine how parental actions affect teen driving behavior. Activities include implementation in driver's education classes of the Checkpoints Program, developed by the National Institutes of Health to improve parental management of the learning-to-drive process; implementation and evaluation of two community-based interventions on enforcement and social normative programs to improve adherence to GDL systems; and support of the Council of State Governments' efforts to enhance state legislators' knowledge about teen driver safety issues and help strengthen their relationships with one another, CDC, and other federal and state agencies. CDC is also developing a communications campaign to improve the safety of teen drivers, their passengers, and other road users. Recently, CDC developed a tool kit to educate coaches and athletes about sports-related concussions. CDC supports several projects now underway to identify and address risk factors for youth suicide and interpersonal violence, including research that examines links between different types of violence and explores the role of violent media on violent behavior.



Adults (Ages 20–49)

- More than 79,500 adults ages 20 to 49 died from injuries in 2002. Motor vehicle crashes were the leading cause of those deaths (CDC 2004).
- Suicide and homicide ranked as the fourth and fifth leading causes of death, respectively, among this age group. As with adolescents, about half of suicides and most homicides involved a firearm (CDC 2004).
- In 2003, nearly 13.6 million adults ages 20 to 49 were nonfatally injured (CDC 2004).
- The most common cause of nonfatal injury was falls (17%), followed by overexertion (15%) (CDC 2004).

Many of CDC's injury and violence prevention efforts address injuries among this group. For example, programs to prevent intimate partner violence, reduce alcohol-impaired driving, increase smoke alarm use, and improve trauma care systems all benefit this age group.



Older Adults (50 and older)

- In 2002, nearly 64,000 adults ages 50 and older died as a result of injuries (CDC 2004).
- Falls were the most common cause of injury death in this age group, accounting for more than 14,000 deaths in 2002 (CDC 2004).
- Falls are the most common cause of nonfatal injuries in this age group. In 2003, 2.7 million older adults were injured from falls, comprising 46% of all nonfatal injuries in this group.
- Drivers ages 65 and older have higher crash death rates per mile driven than all but teen drivers (NHTSA 2004b).
- People ages 75 years and older have the highest rates of traumatic brain injury-related hospitalization and death (CDC 2004).
- In 2002, more than 12,000 Americans ages 50 and older died from suicide (CDC 2004).

Several CDC activities address the problem of injury among older Americans. These include a fire and fall prevention program for older adults and a study which examines reasons why older drivers decide to stop driving. Additionally, CDC is developing a research agenda to prevent older adult maltreatment and is funding research on ways to improve acute injury care among this population.

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Preventing Injuries in America: Public Health in Action

The problem of injury in America is complex. Many types of injury exist—both unintentional and violence-related. For each type of injury, CDC’s Injury Center has a key role in translating research into effective prevention strategies.

This part of the *CDC Injury Fact Book* contains detailed information about a range of injuries, from acute injury care to youth violence. Each section includes data that describe the extent of the injury problem, provide an overview of CDC’s accomplishments in research and prevention efforts, and present future steps the Injury Center and its partners must take to reduce injuries and resulting deaths and disabilities.

Acute Injury Care and Treatment

The Problem

Injuries have physical, emotional, and financial consequences that can impact the lives of individuals, families, and society. Some injuries can result in temporary or long-term disability. Injuries also place an enormous burden on emergency departments (EDs) and trauma care systems.

- In 2002, there were 110.2 million visits to EDs in the United States, representing a 23% increase from the 89.8 million ED visits in 1992. During the same period, the number of EDs in the United States decreased by about 15% (McCaig and Burt 2004).
- The overall rate of ED use in 2002 was 38.9 visits per 100 persons (McCaig and Burt 2004).
- In 2002, fewer than 1 of every 100 ED visits required immediate attention (McCaig and Burt 2004).
- Falls, being struck, or striking against something or someone, and motor vehicle traffic crashes were the leading causes of injuries seen in EDs, accounting for about 40% of ED visits (McCaig and Burt 2004).

CDC's Accomplishments

CDC Acute Injury Care Research Agenda

In 2003, CDC's Injury Center reviewed its current *CDC Injury Research Agenda* chapter on acute care, disability, and rehabilitation. Of the thirteen priority areas for research, only three areas addressed acute injury care, and none dealt with acute injury care in the context of terrorism preparedness and response. Recognizing these gaps, the Injury Center and its partners revised the *CDC Injury Research Agenda's* chapter about acute injury care. This two-year revision process engaged experts from the continuum of injury care and public health. The *Acute Injury Care Research Agenda* was released at the 2005 National Injury Prevention and Control Conference. Representatives of government agencies and national organizations involved in acute injury care have already begun to identify available resources to fully implement the revised research agenda.

Revision of field triage criteria

CDC convened several meetings of emergency care professionals to discuss the status, direction, and next steps for standardizing care of acutely injured people. Participants, including emergency physicians, first responders, and other emergency service providers,

agreed to revise the 20-year-old national field triage guidelines. The group also will help develop a tool kit to serve as an information resource for emergency medical service providers.

Prehospital care around the world

In 2004, prior to the 7th Annual World Injury Conference, CDC convened a meeting in Vienna, Austria, of individuals and organizations active in providing prehospital care to discuss its role in the developing world. Participants reviewed current evidence, examined affordable and effective prehospital interventions, established research priorities, and discussed the role of prehospital care in the larger health system. They also identified future initiatives and directions for the development of prehospital care systems in low-income countries. In 2005, the World Health Organization published a report and recommendations from this meeting, representing more than five years work in worldwide prehospital care.

National Trauma Data Bank, National Sample Project

In 2004, CDC supported the American College of Surgeons (ACS) to develop a nationally-representative sample of U.S. trauma centers that provides data on treated trauma patients. This National Sample Project (NSP) will enhance the ACS's National Trauma Data Bank (NTDB) by providing data to meet the broad range of trauma care assessment, clinical outcomes research, and injury surveillance needs. The NTDB is the largest compilation of traumatic injury data ever assembled, with far-reaching implications for areas such as epidemiology, injury control, research, education, acute care, and resource allocation. Using a representative sample of 100 hospital trauma centers, NSP researchers can make statistically valid inferences about patient care in Level 1 and 2 trauma centers in the United States.

A trauma care system is an organized effort, coordinated by a state or local agency, to deliver the full spectrum of care (from acute injury care to rehabilitation) to injured persons in a defined geographic area.

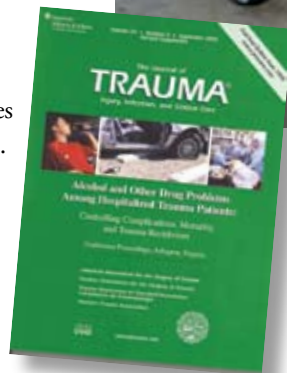
Such a system requires specially trained practitioners and adequate resources, equipment, and support personnel.

Our nation's trauma care systems are in various stages of development, implementation, and evaluation (American College of Emergency Physicians 1999). Although 80% of Americans can access a trauma center within an hour, about 46.7 million Americans cannot (Branas et al. 2005). Some areas lack adequate trauma care—despite evidence that trauma care reduces death and disability rates (Bass et al. 1999).

Conference to discuss alcohol and drug problems among trauma patients

In 2003, CDC convened a conference entitled “Alcohol and Other Drug Problems Among Hospitalized Trauma Patients: Controlling Complications, Mortality, and Trauma Recidivism.” The goal of this conference was to develop a set of research and policy recommendations to improve clinical alcohol and drug prevention and intervention services for trauma patients. Participants included government representatives, trauma surgeons, and substance-abuse treatment researchers. Conference proceedings include recommendations, papers, and detailed summaries of discussion sessions. The proceedings were published as a special supplement to the *Journal of Trauma* in December 2005.

Beginning in fall 2006 and, in part, because of these recommendations, the American College of Surgeons Committee on Trauma (ACS-COT) will require Levels 1 and 2 trauma centers to have a mechanism to identify patients who are problem drinkers. Level 1 centers must also have the capability to provide an intervention for patients identified as problem drinkers. This requirement will be included in the revised 2006 version of *Resources for Optimal Care of the Injured Patient*, published by the ACS-COT.



Research and literature on alcohol and drug problems among college students

CDC-authored research was published in the *Journal of American College Health's* article “Screening and Brief Intervention for Alcohol Problems Among College Students Treated in a University Hospital Emergency Department.” This research suggests that EDs can serve as appropriate venues in which to screen patients for alcohol problems.

CDC-funded research grants

CDC provides grant funding to researchers at universities, medical institutions, and community-based organizations to study various factors related to acute injury care. Examples of extramural research projects follow. For more information about these and other projects, visit www.cdc.gov/ncipc/res-opps/extra.htm.

- **Brief interventions in the ED to reduce risky driving.** University of Cincinnati researchers are testing the effectiveness of administering screening and brief intervention in the ED to limit drivers' problem

drinking and risky driving behaviors (i.e., lack of seat belt use). This prospective, randomized controlled trial will result in a cost-benefit analysis from the perspectives of society overall and hospitals specifically.

- **Health-related quality of life in trauma.** The Johns Hopkins Bloomberg School of Public Health examined approaches for incorporating deaths into an analysis of trauma outcomes. The resulting approaches can be used to estimate the burden of injury in years of healthy life lost. The chief aim of the study was to develop a method for calculating population-based estimates of the burden of major trauma overall and for specific subgroups of people who sustain traumatic injuries (i.e., traumatic brain injury, motor vehicle-related trauma). This research was published in a 2003 *Epidemiologic Review* article titled “Measuring the Public Health Impact of Injuries.” The study supplements the ongoing National Study on the Costs and Outcomes of Trauma Care (NSCOT), which compares the costs and outcomes of care provided in hospitals with and without trauma centers.
- **Outcomes of elderly patients hospitalized with injuries.** Rates of mortality from injury increase with age, and older adults constitute a disproportionate fraction of patients hospitalized with injuries. Researchers at Harvard University's School of Public Health are examining measures to ensure quality care for this increasingly large segment of the population. Using Medicare data, researchers will study how factors such as patient's age and sex, region of the country, hospital volume, and physician experience may affect quality of care. Findings may help improve or standardize care for patients of all ages, and particularly older adults.

Future Steps

During the next several years, CDC will focus on three overarching goals to improve acute injury care:

- Enhance the medical and public health systems' ability to reduce morbidity, mortality, and disabilities among people injured in a mass casualty event.
- Increase the survival and improve the quality of life for injured people through advances in emergency medical response systems and injury care.
- Enhance the ability of state health departments to monitor injuries and to develop and implement injury prevention programs.

CDC will accomplish these goals by completing new and existing initiatives such as those listed below.

Continued development of a national resource for trauma care data

CDC will continue working with the American Trauma Society to enhance the Trauma Information and Exchange Program (TIEP) as a national resource for trauma center and trauma system information. This effort involves maintaining and expanding inventory data and the scope of these data.

Surveys will continue to be distributed among trauma centers and systems affiliated with TIEP to identify key issues in trauma care and to provide meaningful feedback on how TIEP can better serve agencies within its network. TIEP has also developed measures of access to trauma care, using these measures to assess the availability of trauma care across the country and to identify gaps in coverage. Ongoing evaluation and maintenance enable TIEP to provide current information to policy makers, the trauma community, and the public about the status, contributions, and needs of trauma care systems.

Insurance laws and substance abuse screening

CDC is collaborating with four other federal agencies to evaluate the impact of insurance laws on screening and interventions for substance-use problems among acute injury care patients. This project will examine the impact that current state insurance laws have on the detection and treatment of acute injury care patients with substance-use problems; identify and evaluate barriers to improving the standard of care for acute injury care patients with substance-use problems; and explore alternate legal, policy, and economic scenarios to pave the way for improved practice.

Interface between emergency medical system and public health professionals

Emergency service providers and public health professionals share a mutual commitment to saving lives, although strategies to achieve this goal are fundamentally different. Discussions between emergency service providers and public health workers have revealed that the two disciplines are not mutually exclusive. Because each discipline can benefit by using the relevant knowledge and practices of the other, CDC supported the American Public Health Association (APHA) in 2004 to develop a curriculum outline on the interface between the emergency medical system and public health. The outline is being developed into a full curriculum that identifies opportunities and methods to integrate public health and emergency service practices that will enhance day-to-day operations and increase readiness in disaster situations.

Interventions that address acute injury care

CDC is funding three extramural research grants that address priorities in the *Acute Injury Care Research Agenda: Guiding Research for the Future*. The grants include a study on a randomized effectiveness trial to reduce the impact of acute pediatric injury; a patient-centered study to improve trauma outcomes; and a prospective, multicenter, observational study of children with blunt abdominal trauma.

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Alcohol-related Motor Vehicle Injuries

The Problem

An alcohol-related motor vehicle crash kills someone every 31 minutes and nonfatally injures someone every 2 minutes (NHTSA 2004).

- In 2003, 17,013 people died in alcohol-related motor vehicle crashes, representing 40% of the year's total traffic deaths (NHTSA 2004).
- More than 1.4 million drivers were arrested in 2001 for driving under the influence of alcohol or narcotics (DOJ 2002). This number is slightly more than 1% of the estimated 120 million or more episodes of impaired driving that occur among U.S. adults each year (Dellinger, Bolen, and Sacks 1999; Liu et al. 1997).
- About 3 in 10 Americans are involved in an alcohol-related crash in their lifetimes (NHTSA 2001).
- After more than a decade of declining rates in alcohol-related fatal crashes in the United States, rates have begun to climb. Since 1999, rates have increased between 4% and 10% for all age groups, except ages 16 to 17 years (Elder and Shults 2002).
- Each year, alcohol-related motor vehicle crashes in the United States cost approximately \$51 billion (Blincoe et al. 2002).

CDC's Accomplishments

State DUI prevention activities to reduce alcohol-impaired driving

CDC scientists found that in states actively working to prevent DUI, fewer drivers report drinking and driving. The researchers examined the association between states' grades on the 1999 Mothers Against Drunk Driving (MADD) Rating the States survey, which graded states on their DUI countermeasures from 1996 to 1999, and on 1997 Behavioral Risk Factor Surveillance System (BRFSS)



data on residents' self-reported drinking and driving. They found that residents of states with a MADD grade of "D" were 60% more likely to report alcohol-impaired driving than were residents from states with a MADD grade of "A."

Identifying effective interventions against alcohol-impaired driving

In systematic reviews of published research studies, a team of researchers led by CDC found strong evidence for the effectiveness of 0.08% blood alcohol concentration (BAC) laws, minimum legal drinking age laws, sobriety checkpoints, and mass media campaigns that meet certain conditions (i.e., careful audience research, adequate audience exposure, and presence of other alcohol-impaired driving prevention activities). They also found sufficient evidence of the effectiveness for lower BAC laws for young or inexperienced drivers (zero tolerance laws), and intervention training programs for alcohol servers. Finally, they found sufficient evidence that school-based education programs decrease riding with alcohol-impaired drivers (though there was insufficient evidence about the effects on alcohol-impaired driving). These interventions

were effective in reducing fatal and nonfatal, alcohol-related motor vehicle crashes. These reviews, published in *The Guide to Community Preventive Services* in 2005, are available online. Please visit www.thecommunityguide.org.

Mass media campaigns to reduce alcohol-related crashes

Under certain conditions, mass media campaigns are effective in preventing alcohol-impaired driving, according to a CDC report published in July 2004 in the *American Journal of Preventive Medicine*. Based on these findings, the Task Force on Community Preventive Services—a 15-member, nonfederal group with expertise in public health policy and behavioral and social sciences—issued a recommendation for mass media campaigns that are carefully planned and well executed, attain adequate audience exposure, and are implemented in conjunction with other ongoing alcohol-impaired driving prevention activities. The systematic review found that under these conditions, mass media campaigns generally reduced alcohol-related crashes by about 14%. Economic analyses indicated that such campaigns also result in societal benefits that exceed their costs.



Just the Facts . . .

Children and Drinking Drivers

A CDC study of traffic crashes from 1997 to 2002 found that approximately 390 children ages 14 years and younger died each of those years in alcohol-related crashes in the United States. More than two thirds of the children killed were riding with the drinking driver at the time of the crash. The study also found that child passenger restraint use decreased as the blood alcohol concentration of the child's driver increased. In cases where restraint use was recorded, only 32% of fatally injured child passengers of drinking drivers were restrained at the time of the crash (Shults 2004).

Protecting children from drinking drivers

CDC's research found that about 68% of the children killed in alcohol-related crashes were riding in cars driven by drinking drivers. After these data were released, legislators in several states introduced bills to help protect children from drinking drivers. Such legislation creates special penalties under state child abuse laws for people who transport children while driving drunk.

Future Steps

Based on data from the National Highway Traffic Safety Administration and the U.S. Census Bureau, the rate of fatalities in alcohol-related motor vehicle crashes decreased 13% from 1993 to 2002, from 6.9 to 6.0 per 100,000 persons. However, this rate will need to decline substantially to meet the Healthy People 2010 objective of 4.0 per 100,000 persons. Additionally, while alcohol-related fatal crash rates have decreased over the past two decades by 60% for drivers

ages 16 to 17 and by 55% for drivers ages 18 to 20, progress has stalled in the past few years. To further decrease fatal alcohol-related crashes among young drivers, communities need to implement and enforce strategies that are known to be effective, such as minimum legal drinking age laws and "zero tolerance" laws for drivers under 21 years of age.

CDC is involved in the following activities to help reduce alcohol-related motor vehicle crashes among drivers of all ages.

Guide to Community Preventive Services

In addition to evaluating and sharing information about what works to prevent impaired driving, CDC must support communities in implementing proven interventions. Efforts are currently underway to link recommendations in the *Community Guide* with detailed information about how to implement them and to provide examples of model programs when possible.

Cooperative agreements with Native American tribes

To help address the serious problems with motor vehicle-related injuries and fatalities in Native American communities, the Injury Center has funded four tribes to implement recommended interventions from the *Community Guide*. Two of the communities will implement recommended interventions to prevent alcohol-impaired driving. With the assistance of Injury Center staff, our partners will adapt these interventions and evaluate their effectiveness in tribal communities.

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Child Maltreatment

The Problem

- The true number of children who are victims of child maltreatment in the United States is unknown. Information about child abuse and neglect cases that came to the attention of Child Protective Services (CPS) agencies in 2002 indicates that:

- Nearly 900,000 children were confirmed to be victims of child abuse or neglect (ACF 2004).
- More than 60% of these victims suffered neglect (including medical neglect); almost 20% were physically abused; 10% were sexually abused; and 7% were emotionally or psychologically abused (ACF 2004).
- An estimated 1,400 children died from maltreatment. One third of these deaths were from neglect. Physical and sexual abuse were also major contributors to fatalities (ACF 2004).

- Infants are at greatest risk of homicide during the first week of infancy, with the risk being highest on the first day of life (Paulozzi 2002).
- Child maltreatment through blunt trauma to the head or violent shaking is a leading cause of head injury among infants and young children (Committee on Child Abuse and Neglect 2001).
- The perpetrators of child maltreatment are most often parents. In 2002, one or both parents were involved in 79% of child abuse or neglect fatalities (National Clearinghouse 2004).

- Children who experience maltreatment are at increased risk for experiencing adverse health effects and behaviors as adults, including smoking, alcoholism, drug abuse, physical inactivity, severe obesity, depression, suicide, sexual promiscuity, and certain chronic diseases (Felitti et al. 1998).



- Victims of child maltreatment are also at increased risk of experiencing violence as adults. A national survey found that victims who were physically assaulted by caregivers were twice as likely to be physically assaulted as adults (Tjaden and Thoennes 2000).
- As many as one third of parents who experienced maltreatment in childhood may victimize their own children (Fromm 2001).

CDC's Accomplishments

Sociocultural and community risk and protective factors for child maltreatment and youth violence

CDC is funding researchers at the University of Georgia in Athens to examine the sociocultural and community risk and protective factors associated with child maltreatment and early risk

for youth violence. Previous research has described the importance of such factors as access to social capital, community social organization, economic and family resources, residential instability, and community and family violence. However, limited information exists about how these and other risk and protective factors might affect child maltreatment and youth violence. The results from this research will inform the development of violence prevention strategies for communities.

Addressing state surveillance of child maltreatment

Five state health departments are implementing mortality and morbidity surveillance for child maltreatment. California, Michigan, Minnesota, Missouri, and Rhode Island are comparing alternative approaches to state-level surveillance for fatal and nonfatal child maltreatment and are testing methods that may be used for the surveillance of violence at all ages. This program addresses the pressing need for a practical surveillance system for child maltreatment that can be implemented at the state level. It will also help determine the utility of various data sources, including data from hospitals, Child Protective Services, law enforcement, child fatality reviews, and medical examiner and coroner reports.

Developing uniform definitions and recommended data elements

CDC is developing uniform definitions and recommended data elements to improve and standardize data collected for child maltreatment surveillance. Without uniform definitions, different terms are used to describe acts of child maltreatment. These inconsistencies contribute to confusion and a lack of consensus about the magnitude of the problem. Consistent data allow researchers to better gauge the scope of the problem, identify high-risk groups, and monitor the effects of prevention programs. CDC is working with a diverse group of child maltreatment experts and five state health departments currently funded to conduct child maltreatment surveillance to develop uniform definitions. The definitions will be completed in fall 2006.

National Violent Death Reporting System

State and local agencies have detailed information from medical examiners, coroners, police, crime labs, and death certificates that could answer important, fundamental questions about trends and patterns of violence. However, the information is fragmented and difficult to access. CDC has funded 17 states to establish the National Violent Death Reporting System (NVDRS) to gather, share, and link state-level data about violence. Once implemented, NVDRS will enable CDC to compile vital, state-level information to better understand violence. NVDRS will help policy makers and community leaders make informed decisions about violence prevention strategies and programs, including those that address violence against children. NVDRS will also help gather more accurate and in-depth information about victims of child maltreatment and will establish standards for identifying abuse-related deaths.

Consequences of child sexual abuse

Research links child sexual abuse to a range of physical, sexual, reproductive, and psychological problems. Despite this evidence, efforts to prevent child sexual abuse are very limited. A systematic review of the consequences of child sexual abuse is underway to summarize findings from the scientific literature published since 1975. This review will show the links between sexual abuse and consequences, discuss how health care providers can respond, and introduce prevention concepts.

Practices to improve training skills of home visitors

CDC is funding the University of Colorado Health Sciences Center in Denver and the Johns Hopkins School of Medicine in Baltimore to examine two widely used home visiting programs. Home visiting has been reported as an effective strategy for preventing child maltreatment and other adverse child outcomes. However, the relative effectiveness of home visiting varies widely across different programs. Researchers will determine the impact of home visitor training and implementation factors on outcomes of child maltreatment and risk behaviors for youth violence.

Intervention for high-risk families

CDC is working on two projects with the University of Oklahoma's Center on Child Abuse and Neglect and the Oklahoma Department of Human Services. Researchers are:

- Evaluating a pilot program serving families and children at high risk of abuse and neglect, including, but not limited to, parents with drug- or alcohol-abuse problems, mental illness, mental or physical disability, or a history of intimate partner violence.
- Conducting a large-scale effectiveness trial of the Project

SafeCare program. Project SafeCare provides home-based parenting and family preservation services to about 1,000 families in Oklahoma each year.

Review of parenting programs

CDC is reviewing the literature on the scope and efficacy of programs for parents with children from birth to 7 years of age. These programs provide parenting skills that enhance a child's well-being and adjustment. The review will identify common and specific components of parenting program content, mode of program delivery, dosage effect, strategies used for recruitment and retention, evaluation methodology, and results of outcome evaluations. When completed, results from the review will inform CDC's efforts to develop parenting approaches for child maltreatment prevention.

Parenting program attrition and compliance efficacy trial

Difficulties in engaging and retaining parents at risk for child maltreatment in prevention programs have been well documented. Even the most effective parenting programs have limited impact on child maltreatment if parents do not attend sessions or learn and apply alternative parenting skills. CDC is funding Purdue University in Indiana and the University of Oklahoma Health Sciences Center to test the role of different enhancements or service delivery methods for reducing attrition and improving emotional and cognitive engagement and behavioral compliance in an existing efficacious parenting program. Researchers are examining the impact of the strategies on parental attendance, attrition rates, compliance, behavior change, parent and child outcomes, and incidence of child maltreatment. Information about the cost of enhancements is being collected for later analyses.

Just the Facts . . .

Child Maltreatment

The Child Abuse Prevention and Treatment Act identifies four major types of maltreatment: physical abuse, neglect, sexual abuse, and emotional abuse.

- Physical abuse is to inflict a nonaccidental physical injury upon a child. This may include burning, hitting, punching, shaking, kicking, beating, or otherwise harming a child.
- Neglect is the failure to provide for a child's basic needs. Neglect can be physical or emotional.
- Sexual abuse is inappropriate adolescent or adult sexual behavior with a child.
- Other types of child abuse and neglect include emotional abuse and verbal abuse.

Multilevel parent training effectiveness trial

CDC is funding the University of South Carolina to examine the effectiveness of a multilevel intervention program. The Triple P—Positive Parenting Program is a parenting and family support strategy to prevent severe behavioral, emotional, and developmental problems among children by enhancing parents' knowledge, skills, and confidence. The project tests broad strategies aimed at preventing and reducing the risk of child maltreatment and promotes positive parenting to reduce stress and child behavior problems.

Assessment of cultural attitudes and beliefs about parenting practices

CDC has researched attitudes, beliefs, and behaviors among parents to identify regional, ethnic, and socioeconomic factors that influence parenting practices. Information was gathered via a literature review; focus groups; and individual interviews in Hispanic, Asian, African-American, Native-American, and Caucasian populations. The information gathered from this research could be used to inform the development of culturally appropriate messages for diverse audiences.

Collaborations to prevent child sexual assault

CDC is funding three state organizations—Prevent Child Abuse Georgia; Project Pathfinder, Inc., in Minnesota; and Massachusetts Citizens for Children—to develop and implement statewide child sexual abuse prevention programs. The programs will focus on adult or community responsibility in preventing the perpetration of child sexual assault. The funding supports projects using existing infrastructures to broaden prevention efforts.

Preventing Violence Through Education, Networking, and Technical Assistance

CDC is funding the University of North Carolina Injury Prevention Research Center to develop a national training program for violence prevention practitioners. PREVENT (Preventing Violence through Education, Networking, and Technical Assistance) is an outgrowth of the National Injury and Violence Prevention Training Initiative. It is supported by the Society for Advancement of Violence and Injury Research (formerly the National Association of Injury Control Research Centers) and the State and Territorial Injury Prevention Directors Association. PREVENT helps individuals and organizations build skills in identifying community needs and assets, creating and mobilizing partnerships, developing and implementing prevention programs, measuring success, and funding and sustaining programs. A variety of educational methods are used, including distance-learning modules, regional workshops, an intensive institute, action learning projects, and coaching.

BECAUSE Kids Count! (Building and Enhancing Community Alliances United for Safety and Empowerment)

CDC's BECAUSE Kids Count! program expands the capacity of national organizations and their state, local, and regional affiliates to effectively address the prevention of child maltreatment. CDC is funding the National Alliance of Children's Trust and Prevention Funds, Parents Anonymous, and Prevent Child Abuse America to expand their leadership roles in addressing the prevention of child maltreatment before it occurs; to foster collaborations that respond to emerging policy and program issues; to conduct assessments to determine organizational readiness; and to develop a plan to guide prevention activities.

Enhancing State Capacity to Address Child and Adolescent Health Through Violence Prevention

CDC's ESCAPe program is designed to develop capacity and leadership in preventing all types of violence toward or among children and adolescents, including child maltreatment. The planning and implementation phases of this project will address shared risk and protective factors for these forms of violence. Colorado, Iowa, Massachusetts, Michigan, Minnesota, New Mexico, Rhode Island, and Virginia have received funding.

Recommendations to help communities better serve the abused

CDC is partnering with other federal agencies to fund six community projects to implement recommendations from the National Council of Juvenile and Family Court Judges. These recommendations, published in *Effective Intervention in Domestic Violence and Child Maltreatment Cases: Guidelines for Policy and Practice* (called the "Green Book"), are designed to improve how the court system handles cases of abused women and children, to increase the effectiveness of the child protective system, and to enhance services for victims of domestic violence. Project goals include holding batterers accountable for their actions, increasing protection for victims of abuse, and decreasing the number of children who are removed from their non-abusive mothers.

CDC extramural research grants

CDC provides grant funding to researchers at universities, medical institutions, and community-based organizations to study various factors related to child maltreatment. Examples of extramural research projects follow:

- **Evaluation of a program to prevent abusive head trauma.** Researchers at the University of Maryland School of Medicine are evaluating the effectiveness of a hospital-based program to reduce the incidence of abusive head trauma in young children. The program educates

postpartum parents about abusive head trauma and recommends ways to manage a crying infant and their own possible frustration. The researchers will also examine how maternal risk factors affect the risk for abusive head trauma.

- **Social support to enhance home visitation.** Researchers at the Columbia University School of Social Work are examining the effectiveness of an enhancement to home visitation services. Evidence suggests that social contextual factors, especially the social networks of parents, may play a substantial role in the effectiveness of home visiting programs to prevent maltreatment. Initial pilot work has yielded a promising intervention, which will be tested with 100 families. Data on physical child abuse and neglect risk, social networks, parents' sense of control, participation in home visitation, and other associated factors will be collected at baseline and at 3 and 9 months of age.

For more information about these and other projects, please visit www.cdc.gov/ncipc/res-opps/extra.htm.

Future Steps

The full extent of the child maltreatment problem in this country is not known. Current data systems only capture information about child maltreatment that is severe enough to come to the attention of the Child Protective Services system. As a result, many cases of child abuse go unreported and unnoticed. We must develop data collection and tracking systems at the local, state, and national levels to accurately document the scope of the problem and identify changes over time.

CDC is interested in preventing child maltreatment through programs that promote positive parent-child interactions and improve parenting skills. Such programs and policies may provide parents with skills to better manage behavior before violence can occur.

Many communities have implemented programs to prevent child maltreatment, but few programs have been evaluated for effectiveness. CDC's Injury Center is systematically reviewing these programs and creating a database of those that work. The database will include information about target populations, location, activities, evaluation methods, outcomes, and other details to help communities replicate successful programs.

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Child Passenger Safety

The Problem

Motor vehicle injuries are among the greatest public health problem facing U.S. children today. Motor vehicle injuries are the leading cause of death among children at every age after their first birthday (CDC 2005).

- In the United States during 2003, a total of 1,591 children ages 14 years and younger died as occupants in motor vehicle crashes, and approximately 220,000 were injured. That is an average of 4 deaths and 602 injuries each day (NHTSA 2004a).
- In 2002, more than half the children ages 14 and younger killed in motor vehicle crashes were riding unrestrained. Many of these injuries could have been prevented. Placing children in age-appropriate restraint systems reduces serious and fatal injuries by more than half (NHTSA 2004a).
- Children ages 12 years and younger should ride in the back seat, the safest place in a vehicle in the event of a crash. This is especially important for vehicles with front passenger airbags. Passengers riding in the back seat are at least 30% less likely to be injured (Braver et al. 1998).
- Drinking and driving are injury risk factors for child passengers. One in four occupant deaths among children ages 0 to 14 years involves a drinking driver. More than two thirds of these fatally injured children ride with the drinking drivers (Shults 2004).



CDC's Accomplishments

Interventions to increase child safety seat use

Over several years, scientists conducted a rigorous, systematic review of literature about community efforts to increase the use of child safety seats. They analyzed evaluations of those efforts and identified four interventions that were proven effective:

- Laws mandating the use of child safety seats (all 50 states currently have such laws);
- Stricter enforcement of those laws;
- Programs that distribute child safety seats and educate parents about proper use; and
- Programs that provide education about and incentives for child safety seat use.

These research findings were published in 2001 in CDC's *Morbidity and Mortality Weekly Report* and in a supplement of the *American Journal of Preventive Medicine*. In 2005, the findings were published in *The Guide to Community Preventive Services*, a publication of an independent task force. Also known as the *Community Guide*, it provides public health decision makers with recommendations about interventions to promote health and safety and to prevent disease, injury, disability, and premature death.

Drinking, driving, and child passenger safety

In a recent study, CDC scientists found that one in four occupant deaths among children ages 0 to 14 years involves a drinking driver. More than two thirds of these fatally injured children were riding with the drinking driver, and only 32% were restrained (Shults 2004).

A boost for children ages 4 to 8

CDC's Injury Center funded state health departments in Colorado, Kentucky, and New York to develop, implement, and evaluate community-based programs to increase booster seat use among children ages 4 to 8. Between 2000 and 2003, grantees implemented and evaluated community awareness campaigns and school-based programs, aired public service announcements, posted billboards, and conducted booster seat distribution events and car seat checkpoints. Evaluation data from Colorado showed a significant increase in booster seat use in target communities when compared with control communities. Results from these intervention evaluations will help guide future efforts to increase booster seat use.

Kids in the back for a safer ride

CDC's Injury Center funded the Center for Risk Analysis at the Harvard School of Public Health to develop, implement, and evaluate the "Kids in the Back/Niños Atrás" program in a low-income Hispanic community. This three-year, community-based intervention was designed to increase the number of children 12 and younger who ride properly restrained in the back seat of motor vehicles, the safest place for them. Project investigators organized a community task force, developed educational materials for parents and children in English and Spanish, implemented an incentive program to further motivate parents and children to adopt this behavior, coordinated 25 community events and safety seat checkpoints, and conducted a public information campaign targeting parents and caregivers of children. Researchers conducted pre- and post-intervention observational surveys of restraint use and seating position among children ages 12 years and younger in the intervention group and two control communities. During

the intervention period, the percentage of children in the intervention community who were observed riding in the back seat increased from 33% to 49%.

CDC extramural research grants

CDC provides grant funding to researchers at universities, medical institutions, and community-based organizations to study various factors related to child passenger safety. A sample of those extramural research projects follows. For more information about these and other projects, visit www.cdc.gov/ncipc/res-opp/extra.htm.

- **Dissemination of booster seat community intervention.** Researchers at Harborview Injury Prevention and Research Center at the University of Washington are using interviews and focus group studies to better understand behavioral barriers to booster seat use in high-risk Latino communities. Their findings will be used to develop a tailored community intervention. The effectiveness of the intervention will be assessed in a controlled community trial. Booster seat use and child passenger safety practices will be assessed through direct observation.
- **Boost 'em in the Back Seat: A Safe Ride Program.** Using risk communication guidelines, researchers at the Eastern Virginia Medical School are developing a five-minute video that includes crash test footage, portraying the power of crash forces and evoking high emotion by means of vivid imaging. The effectiveness of the video-based program in increasing booster seat use and rear seating will be tested at



Just the Facts . . .

Proper Restraint Using Booster Seats

Having outgrown child safety seats designed for younger passengers, children 4 to 8 years old frequently ride unrestrained or strapped in adult seat belts. Children in this age group should use belt-positioning booster seats until they are 4 feet, 9 inches tall (NHTSA 2004b, 2005). Belt-positioning booster seats raise a child's sitting height to fit a standard lap and shoulder belt. Public health and traffic safety organizations recommend that children in this age group be restrained properly in belt-positioning booster seats. However, among children in this age group who are restrained, only 37% ride in age-appropriate belt-positioning booster seats (Cody et al. 2002).



two large, representative preschool/daycare programs, using two similar control sites for comparison.

- Childhood rear seating among the hard-to-reach.** The Education Development Center, Inc. and the Harvard Injury Control Research Center will disseminate a successful prevention strategy to increase child rear seating in a low-income, ethnically diverse community (Brockton, MA) with a substantial Cape Verdean (African) population. This project builds on the successful CDC-funded, community-based Niños Atrás program for Latino communities and will be led by the same research team. Using focus groups and key informant interviews, researchers will develop

culturally appropriate materials and activities to be disseminated in collaboration with a community coalition. The dissemination strategy will place particular emphasis on ensuring that educational materials and strategies target populations hardest to reach, such as males; minority racial or ethnic groups (i.e., Cape Verdean, Haitian, and Hispanic); and low-income, low-literacy families. The primary outcome, child rear seating, will be assessed by observational study.

Future Steps

Although about 86% of children 14 years and younger use restraints, nearly one third use the wrong restraint for their size and age (Cody et al. 2002). CDC and its partners will work to get more communities to implement proven strategies that increase restraint use among children and to emphasize the importance of using the correct restraint for age and size. CDC has funded the state health departments of Colorado and Michigan to implement evidence-based interventions to increase booster seat use among children ages 4 to 8 years.

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Community Resilience

The Problem

In less than a decade, the United States has seen large-scale domestic terrorist attacks, coordinated violence against Americans abroad, increases in school shootings, and many catastrophic man-made and natural disasters. Such events have heightened awareness of child, family, and community mental health issues and the importance of resilient communities with resources to address the needs of residents during a crisis. Proactive leaders and concerned citizens in many locations have collaborated to develop emergency response plans; in some locations, exercises have been held to practice implementing these plans. Most plans focus on tangible issues like obtaining clean drinking water and food, providing shelter and clothing, and ensuring continuity of medical care and communication systems.

Disasters also have an emotional impact on communities. This includes feelings of anger, anxiety, confusion, depression, fear, grief, guilt, helplessness, and hopelessness; increased sense of insecurity; stigmatization; suspicion or mistrust of authority figures and organizations; and a greater perception of individual, community, and societal vulnerability.

In the absence of proper preparation, treatment, and follow-up, these psychosocial issues can lead to behavioral consequences such as increased alcohol and drug abuse; absenteeism and decreased job performance; higher rates of child maltreatment, youth violence, and speeding or erratic driving; avoidance of mass transportation; sexually transmitted health problems; intimate partner violence; and divorce. Although less common, some people also might experience anxiety attacks, stress-related disorders, and clinical depression.



Flag: Photo by Lauren Hobart/FEMA

Emotional consequences following traumatic events are not limited to the actual victims. Such events also affect families and friends of victims; public safety and health responders (police, firefighters, emergency medical technicians, doctors, nurses) and their families and friends; people who directly witnessed what happened or who watched detailed media coverage; people who narrowly missed being involved in the disaster; special populations (e.g., people with impaired mobility, people dependent on ventilators, frail elderly, people with physical or mental disabilities), and children.

CDC's Accomplishments

CDC is defining the science basis for a new field—community resilience—to address health protection strategies at the community level.

Summit explores community resilience

In 2004, CDC and the Terrorism and Disaster Branch of the National Center for Child Traumatic Stress sponsored a “Community Resilience Mini-Summit” in Oklahoma City. Professionals from key community service sectors such as schools, business, primary care, and families contributed papers. An executive summary has been created that defines and explores the concept of community resilience, recommends ways to develop resilience across different sectors of a community (e.g., public health, mental health, government, business), and describes how to sustain resilience. A guidebook for civic leaders is being developed to illustrate these findings.

Shovels: Photo by Andrea Booher/FEMA

Increasing agency training on resilience

CDC routinely trains agency professionals who respond to crises, including Epidemic Intelligence Service officers and Public Health Readiness team members. To increase the emphasis on psychosocial issues—enhancing the resilience not only of disaster victims but also of those deployed in response and recovery efforts—CDC has incorporated into this curriculum specific mental health competencies related to resilience.

CDC extramural research grants

CDC provides grant funding to researchers at universities, medical institutions, and community-based organizations to study various factors related to community resilience. A sample of those extramural research projects follows. For more information about these and other projects, please visit www.cdc.gov/ncipc/res-opps/extra.htm.

- **Psychological treatment of acute stress disorder following traumatic injury.** The Medical College of

Wisconsin's Injury Research Center is examining the influence of subject, trauma, and injury variables on psychological well-being after injury. Their study focuses on causal attributions; self-efficacy; spiritual and religious values; and perceived level of social support, anger, and personal coping resources. Outcome data include measures of the intensity of posttraumatic stress disorder (PTSD) and depression symptoms. Changes in pre- and post-injury alcohol use will also be examined. Study results will inform early psychological intervention with trauma patients to prevent the development of long-term PTSD and depression symptoms.

- **Behavioral health effects of September 11, 2001.** Columbia University researchers are working to identify opportunities for primary and secondary prevention of terrorist- and disaster-related behavioral health disturbances by assessing the effects of the September 11, 2001, terrorist

attacks on the health of New York City's communities. The study will determine whether there was an increase among vulnerable populations in emergency department and outpatient visits for stress-related conditions. The study will also examine whether such increases are associated with an adverse effect on the overall health of the community.

Future Steps

While resilience among children has been studied for years, integrating and analyzing relevant thoughts, attitudes, and behaviors that contribute to and sustain resilience at the community level is a new endeavor. CDC is working with academic researchers and practitioners to develop tools to measure processes associated with community resilience. Such tools will help identify best practices across communities and enable the efficacy of interventions to be evaluated within the same community. CDC is collaborating with the National Center for Child Traumatic Stress to publish a special journal edition and a textbook devoted to community resilience with an emphasis on children and families.

CDC is researching community-related factors that contribute to the successful implementation of and adherence to movement restrictions mandated by public health (e.g., quarantine and isolation) for emerging infectious diseases. Findings from research about community resilience could enhance the effectiveness and efficiency of those projects.

Efforts are underway to identify common links between risk and protective factors related to community resilience and those of other key areas of activity for CDC's Injury Center such as reducing child maltreatment, youth violence, intimate partner and sexual violence, and suicidal behavior.



Habitat for Humanity: Photo by Kim MacDonald/Habitat for Humanity

Emergency Preparedness and Response

The Problem

Despite the best efforts to protect the public, many Americans may be seriously injured in future mass casualty events such as large-scale natural disasters, disease outbreaks, or explosions. Survivors of these events may sustain unique types or combinations of injuries, such as blast lung (see page 52) or burns, which pose great challenges for medical management. The ability to effectively minimize the impact of such injuries will depend on all levels of the emergency medical response system to act appropriately, from individual providers and single treatment centers to regional networks of medical institutions. State and local public health systems also must be fully prepared and capable of responding to the public in the event of a mass casualty event.

More information is needed about the psychological, social, and behavioral ramifications of mass casualty events—especially terrorist attacks. Initiatives in these areas will provide vital information toward improving response preparedness at the community level. Community preparedness requires creative linkages between existing programs and initiatives (e.g., injury and violence prevention programs, victim assistance programs, and urban renewal projects). Improving collaboration among existing systems employed by social, civic, and faith-based organizations will help increase community preparedness and strengthen the public to manage the psychological and societal effects of mass casualty events.

CDC's Accomplishments

Educating the public, clinicians, and public health professionals

CDC has developed an emergency preparedness and response website: www.bt.cdc.gov/masscasualties/. This site provides information and tools to help the public, clinicians, and public health professionals prepare for and respond to mass casualty events. CDC has developed hospital capacity and injury severity predictor tools, an explosion primer for physicians, and fact sheets about the types of injuries one can expect during a mass casualty event. Additionally, this site includes response tools, fact sheets, and education messages about mental health needs and behavioral reactions, including those of children, following mass casualty events.

Partnerships to address psychosocial and behavioral aspects of mass casualty events

CDC's Injury Center has forged partnerships to address the psychosocial and behavioral effects of mass casualty events. Partners include other U.S. Department of Health and Human Services agencies (National Institute of Mental Health, the Substance Abuse and Mental Health Services Administration, and the Health Resources and Services Administration); the Department of Veterans Affairs' National Center for Posttraumatic Stress Disorder; the American Red Cross, the Department of Defense's Uniformed Services University of the Health Sciences; and university-based networks of public health and traumatic stress researchers and practitioners. To date, these partnerships have resulted in the development of a standardized needs-assessment module to identify informational, social service, medical, and mental health needs in affected communities. The partnerships have



also developed a standardized national surveillance module to assess trends in attitudes, preparedness behaviors, and reactions to terrorism.

To increase community resilience, the Injury Center works with the American Red Cross (ARC) to develop materials about psychosocial issues presented by post-disaster situations. Facilitated by a CDC cooperative agreement, ARC developed "Preparedness Today" at www.redcross.org/preparedness/cdc_english/CDC.asp. This website provides fact sheets and other materials that guide individual preparedness before an emergency, including emergency sheltering and quarantine. The site links to CDC's home page and is accessible via CDC's emergency preparedness Web pages: www.bt.cdc.gov.

Funding of TIIDE project to improve collaboration

In 2002, CDC began funding the Linkages cooperative agreement—now called Terrorism Injuries: Information, Dissemination and Exchange (TIIDE). The TIIDE project includes three interrelated areas: partnerships,

information dissemination, and lessons learned from terrorist events outside the United States. TIIDE partners are national nonprofit or for-profit professional organizations, with at least 25 members, that address acute care, trauma, or emergency medical services. The partnership establishes a foundation for effective collaboration and the exchange of information with the larger community of stakeholders. In July 2003, the National Association of Emergency Medicine Physicians, in partnership with CDC and other Linkages organizations, met in Washington, D.C., to determine how interactive information can be used to care for victims of a mass casualty event through an all-hazards approach. A summary of this meeting, “The Role of Interactive Information Systems for Responding to Events Resulting in Mass Injury,” was published in the July 2004 issue of the *Journal of Prehospital Emergency Care*. CDC and its TIIDE partners have also developed a contact list to facilitate rapid communication among partners after a mass casualty event.

Studying the psychological aftermath of terrorist attacks

CDC has conducted research on the psychological and behavioral reactions to the 2001 terrorist attacks on the World Trade Center and the 2002 sniper attacks in the Washington, D.C., metropolitan area. Women who reported living within five miles of either incident were more likely to experience elevated traumatic stress symptoms than women living farther from the incidents. Among men, no significant association between residential proximity and elevated traumatic stress symptoms was reported. The study outcomes can help to inform future public health interventions for terrorist events. Additionally, CDC personnel have served on the National Advisory Committee on Children and Terrorism.



World Trade Center Evacuation Study yields strategies for risk reduction

CDC supports research at the Columbia University Mailman School of Public Health to identify the individual, organizational, and environmental (building) factors that affected evacuation of the World Trade Center (WTC) on September 11, 2001. During focus groups and qualitative interviews (phase I), WTC evacuees were asked about individual, organizational, and environmental factors that facilitated or posed barriers to evacuation or influenced their decisions to evacuate. Their decision process to evacuate included: perceived ability to walk down multiple flights of stairs; previous experience evacuating a WTC tower; concern over leaving the workplace; workplace preparedness planning and training; structural damage; heavy congestion on certain stairways; and lack of back-up communication. These data provide insights into preparedness planning for evacuating multistory buildings. Results from the qualitative research were published in the September 10, 2004, issue of *Morbidity and Mortality Weekly Report*. Detailed quantitative information on how these factors affected evacuation behaviors, and how these behaviors affected evacuation time, was collected from more than 1,400 evacuees. Findings of this study will provide information for groups such as builders, developers, insurance companies, employee organizations, fire prevention specialists, and emergency planners about risk reduction strategies related to the evacuation of high-rise buildings.



Photo courtesy of *Chest*, 1999

Blast lung injury (BLI) is a direct consequence of pressure upon the body from high-explosive detonations. Because lungs are fragile and sensitive to overpressure, the force from an explosion can cause tearing, hemorrhage, contusion, and edema due to the inappropriate distribution of fluids and oxygen. BLI, a clinical diagnosis characterized by respiratory difficulty and hypoxia, can occur without obvious external

injury to the chest. BLI presents unique triage, diagnostic, and management challenges and is a major cause of morbidity and mortality for blast victims at the scene—particularly the initial survivors.

Fire evacuation data collection tools

CDC has developed protocols and data collection instruments for an epidemiologic field investigation for a large-scale fire and evacuation that could occur in a crowded public building. These materials may be adapted for similar incidents that occur in the future.

CDC extramural research grants

CDC provides grant funding to researchers at universities, medical institutions, and community-based organizations to study various factors related to emergency preparedness and response. Some examples of these extramural research projects follow. For more information about these and other projects, visit www.cdc.gov/ncipc/res-opps/extra.htm.

- **Needs assessment of emergency preparedness and response activities in California schools.** The Southern California Injury Prevention Research Center, part of UCLA's School of Public Health, is conducting a pilot study of public schools' emergency preparedness in 12 school districts in Los Angeles County. The pilot study will inform a larger needs assessment of emergency preparedness for schools in the state's 100 school districts. The study will describe the types of emergencies that occur in schools; describe the intended (written) and actual emergency preparedness activities that exist in schools; identify the types, methods, and perceived adequacy and inadequacy of training provided to school staff; and examine differences in perceived and actual preparedness across school districts.



- **Identifying and treating post-traumatic stress disorder symptoms resulting from traumatic injuries among children.** This project, conducted by the University of California, San Francisco, will clarify the relationship between childhood posttraumatic stress disorder (PTSD) and potential impairment in social, academic, and psychological functioning. The project will also evaluate a novel combination of treatment interventions, which researchers hypothesize could effectively reduce PTSD symptoms for hospitalized children and for large numbers of children requiring immediate treatment after natural disasters, school shootings, or other catastrophic events.

Future Steps

TIIDE-funded partners are engaged in several CDC initiatives that address acute care and the health consequences of terrorism-related events. Future activities include developing a field triage protocol for mass casualty events, developing clinical primers and blast injury training for health care professionals, and translating injury care from the military to the civilian sector. The TIIDE project will enhance CDC's ability to work with the emergency care

Just the Facts . . .

How Mass Casualty Events Affect Health

During a mass casualty event, people can be physically injured and may have limited access to medical care and vital services. People can also suffer emotional and physical stress after a mass casualty event, even if they are not near the scene.

This additional stress can worsen existing health conditions (e.g., diabetes) or trigger a new health problem (e.g., heart attack or depression).

If a mass casualty event occurs, anyone who is injured or suspects injury should seek medical care immediately. Everyone is encouraged to resume personal care:

- Maintain healthy eating, exercise, and sleeping habits;
- Continue to take medicine as prescribed by physicians;
- Maintain daily routines; and
- Talk to others about their feelings and concerns.

community and will ensure that critical information is accessible and effectively communicated to a broad spectrum of health care providers and organizations before, during, and after a terrorist event.

Past mass casualty events indicate that medical resources could be depleted in the aftermath of an event. This depletion could be caused by a surge of persons seeking care during a brief period following the catastrophic event. Currently, limited strategies are in place to deal with a sudden surge of injuries at a ground zero hospital. These hospitals, although affected unequally, would be overrun. CDC is addressing this problem by seeking creative solutions to match resources to need and by identifying rapid, accurate triage methods for treating large numbers of patients with multiple injuries of varying severity. CDC will use a wide spectrum of communication channels to share its findings.

Equally important, CDC plans to develop a mechanism for conducting timely and rapid field epidemiological investigations on evacuation procedures. Incidents necessitating evacuation could include wildfires or fires in large public structures such as

high-rise apartments or commercial buildings. Previously developed data collection instruments and protocols could easily be adapted to address hypotheses regarding psychological and behavioral effects. Study questions that can only be answered by rapid collection of field data may address pre- and post-evacuation expectations, preparedness, practice, prior experience, and decision-making strategies.

Much has yet to be learned about the effects of mass casualty events on one's thoughts, behaviors, and emotions. To help increase awareness and understanding of these issues, CDC plans to complete the following tasks and initiatives:

- Conduct further research leading to a course of action that will help prevent or lessen the psychosocial and behavioral consequences of movement restrictions (e.g., quarantine and isolation) imposed to control the transmission of a communicable disease epidemic.

- Assist state health departments in addressing the psychosocial issues of the general public and special populations (e.g., children, disabled persons, persons with mental illness) to build more resilient communities.
- Develop data collection instruments for use during emergency events to evaluate fear as a contagion in emerging infectious diseases (such as SARS) and to identify the impact on critical workforce behavior and infrastructure during such outbreaks.
- Develop demonstration projects and evaluate best practices for building community resilience, the ability of a community to adapt to unexpected events and stressful situations (e.g., natural disasters and terrorist attacks).

Intimate Partner Violence

The Problem

- Approximately 1.5 million women and 834,700 men are raped or physically assaulted by an intimate partner each year in the United States, according to the National Violence Against Women Survey (Tjaden and Thoennes 2000).
- Nearly two thirds of women who report being raped, physically assaulted, or stalked since age 18 were victimized by a current or former husband, cohabiting partner, boyfriend, or date; in 8 of 10 rape cases, the victim knew the perpetrator (Tjaden and Thoennes 2000).
- More women than men experience intimate partner violence (IPV). According to the National Violence Against Women Survey, 1 in 4 U.S. women has been physically assaulted or raped by an intimate partner; 1 in 14 U.S. men reported such an experience (Tjaden and Thoennes 2000).
- Among women who are physically assaulted or raped by an intimate partner, 1 in 3 is injured. Each year, more than 500,000 women injured as a result of IPV require medical treatment (Tjaden and Thoennes 2000).
- Intimate partner violence is associated with both short- and long-term problems, including physical injury and illness, psychological symptoms, economic costs, and death (National Research Council 1996).
- Each year, thousands of American children witness IPV within their families. Witnessing violence is a risk factor for long-term physical and mental health problems, including alcohol and substance abuse, being a victim of abuse, and perpetrating IPV (Felitti et al. 1998).
- The health care cost of intimate partner rape, physical assault, and stalking exceed \$5.8 billion each year, nearly \$4.1 billion of which is for direct medical and mental health care services (CDC 2003).

CDC's Accomplishments

Developing uniform definitions and recommended data elements

In 1999, CDC published *Intimate Partner Violence Surveillance: Uniform Definitions and Recommended Data Elements* to improve and standardize data collected about intimate partner violence. Similar standards for sexual violence, *Sexual Violence Surveillance: Uniform Definitions and Recommended Data Elements*, were published in 2002. Uniform definitions and recommended data elements for IPV and sexual violence provide consistency in the use of terminology and standardization in data collection. Without these standards, researchers have used varying terms to describe acts of violence. These inconsistencies have contributed to confusion and a lack of consensus about the magnitude of the problem. Consistent data allow researchers to better gauge the scope of the problem, identify high-risk groups, and monitor the effects of prevention programs.

Measuring the incidence and prevalence of intimate partner violence and sexual violence

With external partners, CDC has developed two surveys to help states better assess the problem of IPV, sexual violence, and resulting injuries. The surveys are available as optional modules in the CDC Behavioral Risk Factor Surveillance System. In addition to providing data on the incidence and prevalence of the problem, these surveys will provide knowledge of the related attitudes and norms that allow violence to occur. Data may also be used to compare statistics across states, assess the impact of programs, and guide policy development.

Intimate partner violence (IPV) is actual or threatened physical or sexual violence or psychological and emotional abuse directed toward a spouse, ex-spouse, current or former boyfriend or girlfriend, or current or former dating partner. Intimate partners may be heterosexual or of the same sex.

Developing state-based surveillance systems

CDC funded activities in three states to help monitor and track IPV. These activities helped states identify existing data sources, recognize opportunities to link data sources, and develop and implement more comprehensive systems for monitoring and tracking the problem. Michigan, Minnesota, and Oregon are improving state injury surveillance capacity by implementing the *Consensus Recommendations for Injury Surveillance in State Health Departments*, issued in September 1999. The states supported the integration of intimate partner violence surveillance systems into existing injury surveillance systems and are continuing to revise and test uniform definitions and data elements.

Reporting system to provide objective, timely violence data

State and local agencies have detailed information from medical examiners, coroners, police, crime labs, and death certificates that could answer important, fundamental questions about trends and patterns in violence. However, the information is fragmented and difficult to access. CDC has funded 17 states—Alaska, California, Colorado, Georgia, Kentucky, Maryland, Massachusetts, New Jersey, New Mexico, North Carolina, Oklahoma, Oregon, Rhode Island, South Carolina, Utah, Virginia, and Wisconsin—to establish the National Violent Death Reporting System (NVDRS) to gather, share, and link state-level data about violence. When fully implemented, NVDRS will enable CDC to pull together vital state-level information to gain a more accurate understanding of violence

and will enable policy makers and community leaders to make informed decisions about violence prevention strategies and programs, including those that address IPV.

Assessing links between various forms of violence

CDC is conducting a study to identify the links between different forms of violent behaviors among adolescents. The findings will help scientists understand the prevalence and consequences of different types of aggressive behaviors; the association between dating violence and other forms of peer violence; and the manner in which these types of violent behavior vary by sex, developmental stage, and other factors.

Intimate partner violence perpetration behavior study

CDC is conducting a study to assess how issues of power and control contribute to the development of perpetrator behavior. Study results will help scientists determine the best way to address issues of power and control in prevention and intervention strategies. Information is being collected from court-mandated male perpetrators and controls from the same community to identify characteristics that lead to perpetration.

Culturally-competent demonstration projects

CDC funds 10 projects to prevent IPV and sexual violence among various racial and ethnic populations, including African Americans, American Indians and



Alaska Natives, Hispanic Americans, and Asian Americans and Pacific Islanders. These projects have developed and are evaluating programs for children, victims, and perpetrators; programs to prevent dating violence among school-aged youth; and programs that link victims with community-based service providers. The components and outcomes of interest vary by project.

Violence Against Women Evaluation Guide

CDC developed the *Violence Against Women Evaluation Guide* to help programs develop and implement outcome evaluations. The guide will assist programs in selecting useful, feasible, ethical, and accurate evaluation strategies. It clearly defines evaluation research based on CDC guidelines and provides an overview of issues to consider when evaluating programs that address violence against women. Information about data collection methodology and measures, data analyses, presentation of results, and selection of an external evaluator will be included. The guide is scheduled for release in 2006.

Using social networks to prevent violence against women

CDC is studying how friends, relatives, and acquaintances can influence the behavior of men and women in abusive situations and how social networks can be used to prevent violence against women. Researchers conducted interviews with women in shelters and support groups to identify who helped them make decisions or assisted them in leaving abusive situations. Men in batterer intervention programs were asked how friends, relatives, and acquaintances influenced their partner violence attitudes and behaviors. Results from the study will help direct prevention messages to people in the best position to assist women and men in preventing partner violence and changing the norms that lead to acceptance of violence.

CHOOSE RESPECT campaign aims to prevent intimate partner and sexual violence

CHOOSE RESPECT is a communications campaign that encourages adolescents to develop positive, respectful relationship behaviors. The campaign is designed to reach 11- to 14-year-olds and the caring adults in their lives with prevention messages about choosing respectful, positive relationship behaviors before norms and attitudes that support violence against women are firmly established. Campaign elements include a website, an interactive music video maker, an education video, brochures, posters, cinema slides, and radio and TV spots. The campaign was launched May 2006.

Domestic Violence Prevention Enhancement and Leadership Through Alliances

CDC is funding 14 state domestic violence coalitions to develop and implement prevention activities that can be integrated into Coordinated Community Responses (CCRs) or similar community-based collaborations. The Domestic Violence Prevention Enhancement and Leadership Through Alliances (DELTA) program is adding a significant prevention focus to the existing CCR model by funding state domestic violence coalitions who provide prevention-focused technical assistance, training, and funding to local communities.

Assessment tools for measuring intimate partner violence

CDC has developed *Measuring Intimate Partner Violence Victimization and Perpetration: A Compendium of Assessment Tools*. The compendium will provide researchers and prevention specialists with a set of assessment tools with demonstrated reliability and validity for measuring the self-reported incidence and prevalence of IPV and perpetration. The compendium will be available late 2006.

CHOOSE RESPECT



Recommendations to help communities better serve the abused

CDC is partnering with other federal agencies to fund six community projects to implement recommendations from the National Council of Juvenile and Family Court Judges. These recommendations, published in *Effective Intervention in Domestic Violence and Child Maltreatment Cases: Guidelines for Policy and Practice* (called the “Green Book”), are designed to improve the way the court system handles cases of abused women and children. The recommendations are also designed to increase the effectiveness of the child protective system and to enhance services for victims of IPV. Project goals include holding batterers accountable for their actions, increasing protection for victims of abuse, and decreasing the number of children who are removed from their non-abusive mothers.

Evaluation assistance for projects to prevent first-time male perpetration of sexual violence

CDC has provided evaluation assistance to four projects designed to prevent first-time perpetration of sexual violence by males. Designed to help the programs build capacity to conduct their own evaluations, the key elements CDC provides are training and coaching on the use of evaluation concepts, techniques, and findings to foster program improvement.

Rape Prevention and Education program

CDC administers the Rape Prevention and Education (RPE) program and provides technical assistance to health departments, sexual assault coalitions, partner organizations, and other agencies. The RPE program supports educational seminars, hotline operations, training programs for professionals, informational materials, and other efforts to increase awareness of sexual violence, including that perpetrated by intimate partners. Through this program, states and territories have implemented prevention and education programs and developed a stronger infrastructure to address sexual violence.

Rape Prevention and Education program evaluability assessment

To enhance the administration and use of the Rape Prevention and Education (RPE) funding, CDC assessed how states allocate funds and the types of activities the funds support. The primary objectives of this study were to document the goals and objectives of the RPE program as it relates to the activities of state health departments and sexual assault coalitions; to assess the allocation mechanisms, uses, and impact of the funds; and to assess the public health needs of states and local programs in terms of knowledge, skills, resources, and barriers to effective implementation.

Preventing Violence through Education, Networking, and Technical Assistance

CDC is funding the University of North Carolina Injury Prevention Research Center to develop a national training program for violence prevention practitioners. The initiative, known as PREVENT (Preventing Violence through Education, Networking, and Technical Assistance), is an outgrowth of the National Injury and Violence Prevention Training Initiative and is supported by the Society for Advancement of Violence and Injury Research (formerly the National Association of Injury Control Research Centers) and the State and Territorial Injury Prevention Directors Association. PREVENT helps individuals and organizations build skills for identifying community needs and assets, creating and mobilizing partnerships, developing and implementing prevention programs, measuring success, and funding and sustaining programs. PREVENT uses various educational methods including distance-learning modules, regional workshops, an intensive institute, action learning projects, and coaching.

National Sexual Violence Resource Center

The National Sexual Violence Resource Center (NSVRC) provides information, resources, and research on all aspects of sexual violence, including intimate partner sexual violence. The NSVRC collects, reviews, catalogs, and disseminates information about sexual violence prevention and intervention; coordinates efforts with other organizations; provides technical assistance and customized information; and maintains a website. The website links to sexual assault resources and information about upcoming conferences, funding opportunities, job announcements, research, and special events. The NSVRC also

produces a biannual newsletter, recommends speakers for conferences, coordinates national sexual assault awareness activities, and identifies emerging policy issues and research needs. Further, the NSVRC serves coalitions, local rape crisis centers, government and tribal entities, colleges and universities, service providers, researchers, allied organizations, policy makers, and the general public. Additional information can be found online at www.nsvrc.org.

National online resources for violence against women

CDC has funded the Pennsylvania Coalition Against Domestic Violence (PCADV) and the California Coalition Against Sexual Assault's (CALCASA) Prevention Connection to provide national, online resources for preventing violence against women. These resources will support local, state, national, and tribal agencies and organizations in developing, implementing, and evaluating prevention and intervention programs for violence against women. For more information, visit www.vawnet.org and www.preventconnect.org.

CDC-funded research grants

CDC provides grant funding to researchers at universities, medical institutions, and community-based organizations to study factors related to IPV. For information about CDC's extramural research projects, visit www.cdc.gov/ncipc/res-opp/extra.htm.

Some examples of CDC-funded grants follow:

- **Effects of formal danger assessment on actions to prevent women from partner violence.** Researchers at the Johns Hopkins University School of Public Health are assessing whether using a standardized, empirically based tool to generate and

communicate scores reflecting the level of danger a victim of IPV faces will lead to more or less protective actions taken by the victim and the courts. In addition to educating IPV victims about the dangers they face and effective strategies for preventing further violence, legal advocates will use danger score information in communications with judges and prosecutors to influence legal decisions relevant to victim safety.

- **Piloting a family-based program for preventing adolescent dating violence.** Researchers of the University of North Carolina at Chapel Hill are developing and pilot testing Families for Safe Dates, a family-based program to address multiple types of youth violence, including dating violence (psychological, physical, and sexual), victimization and perpetration, and violence directed at peers. The content of Families for Safe Dates will draw heavily from Safe Dates, an effective school-based program to prevent dating violence. The premise and structure will model the Family Matters program, a program that successfully reduced the prevalence of adolescent substance use.

- **Examining partner violence perpetration among men.** Harvard School of Public Health researchers are conducting a mixed-methods retrospective cohort study of men ages 18 to 35 living within racially and ethnically diverse neighborhoods in the Boston area. Men in this age group perpetrate IPV at the highest rates. The study will assess risk and protective factors for perpetration of IPV. Researchers also will assess interrelations of IPV perpetration and perpetration of other forms of violence (i.e., suicide, sexual violence, child maltreatment, general violence). Finally, researchers will assess the relevance of findings regarding risk and protective factors for IPV perpetration and compare with findings for the population of men enrolled in treatment programs from these same communities.

Future Steps

The full extent of nonfatal and fatal intimate partner violence (IPV) in the United States is not known. To better document the scope of the problem and identify trends in incidence and prevalence, the quality of data collection at national, state, and local levels must be improved.

Scientists, public health professionals, advocates, and others in the field must increase efforts to stop IPV from occurring. To this end, CDC will fulfill its public health responsibilities by evaluating interventions for IPV prevention and communicating sound, science-based recommendations about programs and practices that work.

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Older Adult Drivers

The Problem

In 2002, a total of 7,688 people ages 65 and older died in motor vehicle crashes in the United States (CDC 2005).

- Drivers ages 65 and older have higher crash death rates per mile driven than all but teen drivers (NHTSA 2004).
- Rates for motor vehicle-related injury are twice as high for older men as for older women (Stevens et al. 1999).
- Motor vehicle-related deaths and injuries among older adults are rising. During 1990–1997, the number of deaths rose 14%, and the number of nonfatal injuries climbed 19% (Stevens et al. 1999).
- The 65-and-older age group is the fastest growing segment of the U.S. population. Estimates indicate that more than 40 million older adults will be licensed drivers by 2020 (Dellinger et al. 2002).

CDC's Accomplishments

Why older adults stop driving

Scientists at CDC's Injury Center worked with the University of California, San Diego, to survey older drivers living in community settings about why they stop driving. The most common reasons for stopping were medical conditions—frequently, poor vision. This research provides useful insight into why older drivers decide that they are no longer fit to drive, which can help public health practitioners develop programs to reduce motor vehicle-related injuries in this population. These findings were published in 2001 in the *Journal of the American Geriatrics Society*.



Older drivers are less likely than younger drivers to kill others in a crash

CDC researchers analyzed fatality data to determine whether older drivers were more likely than younger drivers to be involved in crashes that killed someone else. They found that, in fact, older drivers were involved in fewer of these crashes than were drivers 16 to 34 years old. This study helps dispel the myth that older drivers present an unacceptable threat to others on the road. Study findings were published in 2004 in the *American Journal of Preventive Medicine*.

Fatal crashes among older drivers

CDC researchers analyzed fatal crash involvement rates for drivers ages 65 years and older. They assessed how the crash fatality rate (risk of death), incidence density (risk of crash), and exposure prevalence (amount of driving) contributed to the fatal crash involvement rates of older drivers. The crash fatality rates and the incidence densities increased with age, while the exposure prevalence decreased. In other

words, although older drivers drove less, they were more likely to crash and to die in a crash. These findings suggest that older driver crash deaths can be reduced by decreasing their crash risk, their risk of injury when a crash occurs, or by decreasing the amount they drive. Research findings were published in 2002 in the *American Journal of Epidemiology*.

License renewal and crash risk among older drivers

With CDC funding, researchers at the University of Washington are investigating the relationship between older drivers' crash risk and the time since their last license renewal. The interval between license renewals is an issue of public policy, and states must balance the crash risk caused by drivers who have become impaired against the cost and inconvenience of more frequent renewals. The results of this study will help decision makers determine the appropriate interval between license renewals for older drivers.

Race and sex disparities in motor vehicle-related deaths among older adults

CDC researchers analyzed annual mortality data to identify differences in motor vehicle-related death rates among adults 65 and older by sex, race, and ethnicity. From 1990 to 1998, motor vehicle-related death rates were highest among Native-American and African-American men, while women's rates were highest among Native Americans and Asian/Pacific Islanders. These findings of racial- and sex-related disparities, published in the journal *Injury Prevention* in 2002, will be useful for identifying high-risk groups and for developing prevention strategies that target them (Stevens and Dellinger 2002).

CDC extramural research grants

CDC provides grant funding to researchers at universities, medical institutions, and community-based organizations to study various factors related to older adult drivers. A sample of those extramural research projects follows. For more information about these and other projects, please visit www.cdc.gov/ncipc/res-opp/extra.htm.

- **Policies for older driver safety: evaluation of older driver policies and practices in other countries.** Other countries, especially developed nations with high numbers of licensed drivers and advanced highway systems, face many of the same issues as the United States concerning older drivers. Researchers at the Johns Hopkins Bloomberg School of Public Health are systematically reviewing other nations' policies, programs, and practices for older drivers to assess applicability in the United States. This research will examine whether a policy of staged licensing curtailment for older

drivers—analogue to graduated licensing for younger drivers—would be appropriate and effective. Based on findings, researchers will develop and widely disseminate policy recommendations.

- **Reducing older driver injuries at intersections.** Data from other countries have shown that roundabouts dramatically improve traffic conflicts and overall safety at intersections. But in the United States, subjective data show that drivers, especially older drivers, fear what they perceive to be elevated demands and risks associated with roundabouts, and they may avoid their use. Researchers at the Texas A&M Research Foundation (part of Texas A&M University) explored the development of more elder-friendly designs for roundabouts. The results, reported in June 2005, informed recommendations for developing new guidelines for modern roundabouts, where the overall goal was to foster the use of these facilities by the groups most at risk of injury in intersection crashes, including older adults.

Future Steps

Basic questions remain unanswered. CDC must work with a variety of partners—for example, clinicians, advocacy groups, transportation experts, and older drivers themselves—to determine under what conditions older adults *choose* to stop driving and under what conditions they *should* stop driving. Issues to consider include:

- How medical conditions increase the risk of a crash;
- How much older adults drive and what their transportation needs are;

- Why older adults decide to stop driving;
- Whether they stop driving at the appropriate time and for the right reasons;
- Whether screening tests can successfully identify high-risk older drivers;
- How to practically measure older adults' functional ability to drive; and
- Alternatives to driving that would be both practical and acceptable to older adults.

This information will enable policy makers and public health practitioners to make informed decisions and develop effective strategies to reduce the number of injuries and deaths among this age group.

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Older Adult Falls



The Problem

- More than one third of adults 65 years or older fall every year (Hornbrook et al. 1994; Hausdorff et al. 2001); both falls and fall injury rates increase sharply with age (CDC 2001).
- Among seniors, falls are the ninth leading cause of death and the leading cause of fatal and nonfatal injuries (CDC 2005).
- In 2002, 12,800 older adult deaths were caused by falls (CDC 2005).
- Falls are the most common cause of nonfatal injuries and of hospital admissions for trauma (Alexander et al. 1992).
- Between 20% and 30% of falls cause moderate to severe injuries that reduce mobility and independence and increase the risk of premature death (Alexander et al. 1992; Sterling et al. 2001).
- In 2002, 1.64 million persons visited hospital emergency departments for nonfatal injuries; 388,000 of those treated were hospitalized (CDC 2005).
- Most fractures are caused by falls (Bell et al. 2000), and the most serious type is hip fracture. Up to 20% of hip fracture patients die within a year (Liebson et al. 2002), and those who survive often experience significant disability and reduced quality of life (Wolinsky et al. 1997; Hall et al. 2000).
- In 2001, about 327,000 hospital admissions were for hip fracture; 76% were among women (CDC 2001).
- In 1994, fall injuries totaled \$27.3 billion. By 2020, the cost of these injuries is projected to reach \$43.8 billion (figures adjusted for inflation; Englander et al. 1996).

CDC's Accomplishments

Falls prevention materials

In 1999, CDC's Injury Center published the *Tool Kit to Prevent Senior Falls*. It contained fact sheets and health education materials (brochure and home safety checklist) aimed at reducing falls and related injuries among older adults. In 2001, Spanish versions of the brochure and checklist were made available. More than 6,000 organizations used the *Tool Kit* in fall prevention programs. Materials were distributed to senior centers, hospitals, and health departments. Materials were also incorporated into professional presentations and instruction for nursing and other health care students. Although the *Tool Kit* is no longer available as a complete package, individual pieces (available in English, Spanish, and Chinese) have been updated and can be ordered at no cost or downloaded from www.cdc.gov/ncipc/pub-res/toolkit/brochures.htm.

Dane County Safety Assessment For Elders (SAFE) research study

In October 2002, CDC funded the Wisconsin Department of Health, in collaboration with the University of Wisconsin, to conduct a randomized controlled trial to assess the effectiveness of a comprehensive approach to preventing falls among community-dwelling, higher-risk adults ages 65 and older. It uses two complementary strategies: a comprehensive at-home assessment followed by individualized risk reduction and a broad-based program to educate primary care physicians and other health practitioners. The study began in late October 2003; 352 participants have been enrolled to date, and 62 have completed their one-year enrollment period.

No More Falls! study

In October 2001, CDC funded the California State Health Department to conduct a randomized controlled multicomponent fall-prevention study for older adults. The study integrates fall prevention into the Preventive Health Care for the Aging (PHCA) program, a community-based public health program for older adults. The study, which had about 500 participants, was implemented in PHCA clinics in San Diego and Humboldt counties. The intervention included four elements: education about fall risk factors, referrals to community exercise programs to increase strength and balance, medication review, and home modification to reduce home hazards. The study was completed in 2004 and these data are now being analyzed.

National Resource Center on Safe Aging

In 1998, CDC funded the San Diego State University Foundation and the University Center on Aging at San Diego State University to develop a national resource center. The Resource Center's mission is to gather and share the best information and resources on injury prevention and senior safety, including pedestrian and motor vehicle safety and the prevention of falls and elder abuse. Information can be obtained at www.safeaging.org.

Program to prevent fire- and fall-related deaths among older adults

In October 2000, CDC began funding state health departments in Arkansas, Maryland, Minnesota, North Carolina, and Virginia to implement and evaluate a program to teach older adults how to prevent fires and falls. Remembering When: A Fire and Fall Prevention Program for Older Adults is a curriculum developed by the National Fire Protection Association, CDC, and other partners. It uses lesson plans, brochures, fact sheets, game cards, and other educational



materials to present 16 life-saving lessons. This program is the first of its kind to combine education about fire- and fall-related injury prevention among older adults and is one of the few off-the-shelf programs of its type available to communities. To date, 382 group presentations and 457 individual presentations have been conducted; 3,245 smoke alarms have been installed.

In August 2002, CDC and Georgia State University began evaluating the effectiveness of the Remembering When program to assess the knowledge and skills needed to reduce falls and fires. Preliminary data show significant gains in knowledge on space heaters, safe clothing, and fall reduction in bathtubs. The home assessment showed an increase in the use of bath mats, night lights, and working smoke alarms. Manuscripts are currently being written, including recommendations for dissemination.

Estimating the health care costs of older adult fall-related injuries

In 2003, North Carolina's Research Triangle Institute was awarded a contract to estimate the direct medical cost of fall-related injuries among U.S. adults ages 65 and older for

2000. Estimates for fatal falls were derived from directly measured acute care costs plus nursing home costs for those who survived beyond hospital discharge. Nonfatal fall injuries were identified using claims data for about 4 million Medicare enrollees. The claims contained detailed payment information for all covered services (hospital inpatient, outpatient, skilled nursing, home health, hospice, physicians/supplier services, and durable medical equipment).

Falls Free: Promoting a national action plan to prevent falls among older adults

Because falls are recognized as a major public health problem, the National Council on Aging (NCOA), in collaboration with CDC and with funding from The Archstone Foundation and the Home Safety Council, spearheaded an initiative titled Falls Free: Promoting a National Falls Prevention Action Plan. The initiative, which provides strategic input into the development of a national blueprint to prevent older adult falls, was released at the American Society on Aging-NCOA Conference in March 2005 (visit www.healthyagingprograms.org).

Healthy Aging Prevention of Falls project

In October 2001, CDC's Injury Center and the National Center for Chronic Disease Prevention and Health Promotion funded the National Safety Council (NSC) to conduct a series of 8 to 10 focus groups in urban and rural settings. Information will be gathered from seniors, caregivers, and health care providers about their knowledge and attitudes about safety. The focus groups will also be asked about two Injury Center brochures on fall prevention. From these findings, the NSC will create and test three brochures for seniors, families and caregivers, and medical and other senior service providers.

Just the Facts . . .

Falls and Prevention

- The most effective fall intervention strategy is a comprehensive clinical assessment combined with individualized fall risk reduction and patient follow-up (Rand 2003).
- Environmental risk factors in and around the home (i.e., tripping hazards, lack of stair railings, or poor lighting) can increase fall risk (Northridge et al. 1995; Connell 1996, Gill et al. 1999). Improve home safety by installing handrails on both sides of stairs; installing grab bars next to the toilet and in the tub or shower; removing tripping hazards such as throw rugs and clutter; and using nonslip mats in the bathtub and on shower floors.
- Poor vision increases the risk of falling (Lord and Dayhew 2001). At least once a year, seniors should have an eye doctor check their vision and correct it as much as possible.
- Psychoactive medications such as tranquilizers, sleeping pills, and antianxiety drugs can make a person more likely to fall (Ray and Griffin 1990). Having a doctor or pharmacist review prescription and over-the-counter medicines can reduce side effects and interactions.
- Muscle weakness, gait, and balance problems increase the risk of falling (Graafmans et al. 1996; American Geriatrics Society 2001). Exercise is an effective prevention strategy to improve leg strength and balance (Rand 2003). Tai Chi is one example of this type of exercise (Wolf et al. 1996).



CDC extramural research grants

CDC provides grant funding to researchers at universities, medical institutions, and community-based organizations to study various factors related to falls among older adults. Examples of those extramural research projects follow. For more information about these and other projects, visit www.cdc.gov/ncipc/res-ops/extra.htm.

- **Understanding factors that influence hip protector use among community-dwelling seniors.** CDC funds researchers at the University of North Carolina Injury Prevention Research Center to evaluate the acceptability of hip protectors among community-dwelling seniors. Researchers seek to identify perceived barriers, promote acceptability, and encourage hip protector use.

The researchers will identify a sample of community-dwelling older adults and explore their reactions and attitudes to hip protectors using a combination of focus group and interview strategies. Another group of participants will be interviewed and then provided with three pairs of hip protectors, instructed in their use, and asked to wear them for one week. Participants will be interviewed again after one week to find out their attitudes toward various aspects of the hip protectors (i.e., ease of use, comfort and fit, ease of care) and their physical difficulties or illnesses. Follow-up data will be collected about adherence, falls that may have occurred, and whether hip protectors were being worn at the time of the fall. This process will be repeated four times with different types of hip protectors.

- **Preventing falls through enhanced pharmaceutical care.** Researchers at the University of North Carolina at Chapel Hill evaluated the effectiveness of a community-based fall-prevention program delivered by community pharmacists. The target population comprised community-dwelling older adults ages 65 and older who had fallen within the past year, had used four or more prescription medications, or had used at least one medication that acts on the central nervous system. A community pharmacist consulted the intervention group about their current medications. The control group was given a series of monthly informational materials about prevention and treatment of health problems associated with aging (e.g., osteoporosis, heart disease) and lifestyle behaviors important for health maintenance (e.g., exercise). All individuals were followed for one year. Data about falls were collected via monthly falls calendars.

Future Steps

Fall injuries place an enormous burden on individuals, society, and the health care system. Because the U.S. population is aging, this problem will worsen unless we take preventive action. Even though much is known about effective fall prevention strategies, these strategies need to be refined, implemented, disseminated, and promoted—especially at the local level. Further research would also help tailor interventions for populations with differing characteristics and risk factors. The resulting data would indicate the underlying causes or circumstances of falls and how these differ between men and women. Clarifying these differences and obtaining information about the location and events preceding a fall-related injury is vital to identifying high-risk behaviors and situations and to developing and implementing improved fall prevention strategies.

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Pedestrian Injuries

The Problem

In the United States, a total of 4,749 pedestrians died from traffic-related injuries and another 70,000 sustained nonfatal injuries in 2003. On average, a pedestrian is killed in a traffic crash every 111 minutes and is injured every 8 minutes (NHTSA 2004).

- In 2003, almost one quarter (22%) of children ages 5 to 9 years killed in traffic crashes were pedestrians (NHTSA 2004).
- Pedestrians ages 75 and older accounted for 16% of all pedestrian deaths and about 6% of nonfatal pedestrian injuries in 2003. The pedestrian death rate for this age group is higher than for other age groups (NHTSA 2004).
- The pedestrian fatality rate is more than twice as high for men as for women (NHTSA 2004).
- In 2003, 34% of pedestrians killed by a motor vehicle and 13% of drivers who killed pedestrians were intoxicated, with blood alcohol concentrations of 0.08% or more (NHTSA 2004).

Certain racial and ethnic groups are at increased risk for pedestrian deaths (CDC 2005).

- American Indians and Alaska Natives have rates 3 times higher than whites.
- African-Americans pedestrian deaths are 1.7 times that of whites.
- Hispanics die at a rate 1.8 times higher than non-Hispanics.



CDC's Accomplishments

Understanding community characteristics

CDC-funded researchers at Johns Hopkins University studied community characteristics that may affect interventions to prevent child pedestrian injuries. Researchers compared four neighborhoods with varying risks of pedestrian injury and median household income. Their findings associated child pedestrian risk with wide roads and parking on both sides of the street. Although parents often allowed children younger than the recommended age of 10 years to cross streets alone, researchers found that parents were willing to become involved in child pedestrian safety initiatives.

CDC extramural research grants

CDC provides grant funding to researchers at universities, medical institutions, and community-based organizations to study various factors related to pedestrian safety. A sample of those extramural research projects follows. For more information about these and other projects, visit www.cdc.gov/ncipc/res-opps/extra.htm.

- **Mapping risk and evaluating interventions.** The Departments of Public Health and Parking and Traffic in the County of San Francisco have been funded to better understand pedestrian safety and to pursue intervention strategies. They will use geographic information systems (GIS) to analyze pedestrian

injury outcomes by location. This analysis will be used to identify intersections, neighborhoods, and traffic corridors that are most hazardous to pedestrians; to identify environmental risk factors that constitute those hazards; and to evaluate the effect of installing special pedestrian signals.

- **Pediatric pedestrian safety in virtual reality.** Researchers at the University of Alabama at Birmingham are developing and validating virtual reality (VR) software as a tool for training children about pedestrian safety. VR software and hardware will be developed to simulate a street with realistic, computer-controlled traffic patterns. The virtual environment will allow participants to engage in (and investigators to measure) street-crossing behavior in a laboratory or classroom setting. While engaging in the virtual environment, participants will stand on an artificial curb, view traffic on a five-monitor semicircular display in front of them, and hear traffic through surround-sound speakers. Stepping off the curb will activate a pressure sensor connected to the computer to record when participants begin crossing. After the software is developed, two validation studies will be conducted: one with adults and a second with children. Subsequent research phases will use the VR environment as an intervention tool to train children on pedestrian safety.

Future Steps

To improve pedestrian safety and to identify the most effective interventions, rigorous evaluation of prevention programs must continue. Meanwhile, some evidence shows that environments can be modified to substantially reduce the risk of pedestrian injuries (Retting et al. 2003).

Such modifications include separating pedestrians from vehicles by time or space (e.g., sidewalks), increasing pedestrian visibility (e.g., better lighting at crosswalks), and reducing vehicle speed (e.g., replacing conventional intersections with roundabouts).

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Residential Fires

The Problem

Available statistics show the United States has the sixth highest fire death rate among 25 developed countries (International Association for the Study of Insurance Economics 2003). On average in the United States in 2003, someone died in a fire every 2 hours (every 134 minutes), and someone was injured every 29 minutes (Karter 2004).

- In 2003, fire departments responded to 402,000 home fires in the United States which claimed the lives of an estimated 3,145 people (not including firefighters) and injured another 14,075 (Karter 2004).
- Cooking is the primary cause of residential fires; smoking is the leading cause of fire-related deaths (Ahrens 2003). Alcohol contributes to about 40% of residential fire deaths (Smith et al. 1999).
- In 2003, residential fires resulted in direct property damage totaling \$6 billion (Karter 2004).

Who is at the greatest risk for fire-related deaths?

- Children ages 4 and younger (CDC 2005)
- Adults ages 65 and older (CDC 2005)
- The poorest Americans (Istre et al. 2001)
- African Americans and Native Americans (NCHS 1998)
- Persons living in rural areas (Ahrens 2003)
- Persons living in manufactured homes or substandard housing (Runyan et al. 1992; Parker et al. 1993)



CDC's Accomplishments

Preventing residential fire-related injuries

CDC works in partnership with the U.S. Fire Administration (USFA), the U.S. Consumer Product Safety Commission (CPSC), and several nongovernment organizations to coordinate a national effort that will help to eliminate residential fire deaths by 2020. To support this effort, Congress appropriated \$5 million in fiscal year 2002 to the three agencies for a new fire safety campaign targeting high-risk populations—older adults, children, and firefighters. The partners have initiated activities related to surveillance, research, community programs, and marketing. Joint activities include research on the risk factors for residential fire-related injuries; data collection and analysis to track trends and progress; CDC's community-based smoke alarm installation and fire safety education project; and a pilot project to examine a community-based Civilian Fire Safety Corps, whose primary purpose is to conduct fire safety education. Recently,

CDC and USFA began to assess the effectiveness of fire safety programs and initiatives that their agencies have traditionally funded.

Funded partnership saves lives

Since 1998, CDC has funded smoke alarm installation and fire safety education programs in high-risk communities—those with fire death rates higher than state and national averages and median household incomes below the poverty level. An informal sample of program homes found that an estimated 1,071 lives may have been saved thus far. Program staff have canvassed more than 382,000 homes and installed more than 275,000 long-lasting smoke alarms in high-risk homes, targeting households with children ages 5 years and younger and adults ages 65 years and older. Fire safety messages have reached millions of people because of these programs. CDC funded 14 states from 1998 to 2000. Based on the success of these programs, CDC awarded five-year cooperative agreements to 13 states in 2001 to install long-lasting, lithium-

powered smoke alarms and to provide fire-safety education for homes in high-risk communities. Those states are: Alabama, Alaska, Georgia, Kansas, Kentucky, Minnesota, Mississippi, New York, North Carolina, Oklahoma, South Carolina, Virginia, and Washington. In 2002, an additional 3 states (Arkansas, Massachusetts, and Montana) were awarded funding for these activities, bringing the total number of CDC-funded states to 16.

Three stories demonstrate how these programs helped save lives:

- A young boy awoke to the sound of the smoke alarm that had been installed in his home the year before through a CDC-funded program. A candle that had been left burning near a recliner had set the chair on fire. Upon hearing the alarm, the boy awakened his mother and they escaped without injury. The fire destroyed the house; the smoke alarm saved its residents.
- Firefighters in a major city expressed concern for a particular neighborhood after repeatedly responding to fires in homes without smoke alarms. The firefighters went door-to-door in the community to install smoke alarms and distribute educational materials provided by the Injury Prevention Service at the State Department of Health. In one month, they canvassed a square mile and installed 50 smoke alarms. Not long after their campaign, a six-year-old child in one of the homes started a fire while playing with matches. The smoke alarm alerted the mother, and the residents of the home escaped without injury.
- As part of a CDC-funded program, a firefighter installed a working smoke alarm for a family whose alarm had no battery. A few weeks later, the father woke early to light an oil

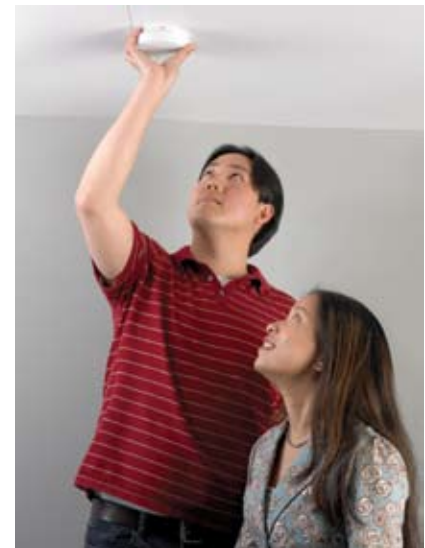
space heater. Under medication for surgery at the time, he forgot to open the damper to the chimney. He returned to bed, and the heater soon began discharging soot throughout the home. Smoke from the heater quickly reached the next room, which contained the newly installed alarm. The alarm woke the family, and they immediately turned off the heater before opening doors and windows to ventilate the home. The father stated that if the alarm hadn't sounded, the family would have suffered smoke inhalation, carbon monoxide poisoning, or worse.

Program to prevent fire- and fall-related deaths among older adults

In October 2000, CDC began funding state health departments in Arkansas, Maryland, Minnesota, North Carolina, and Virginia to implement and evaluate a program to teach older adults how to prevent fires and falls. Remembering When: A Fire and Fall Prevention Program for Older Adults is a curriculum developed by the National Fire Protection Association, CDC, and other partners. Remembering When uses lesson plans, brochures, fact sheets, game cards, and other educational materials to present 16 life-saving lessons. This program is the first of its kind to combine education about both fire- and fall-related injury prevention among older adults and is one of the few off-the-shelf programs available to communities for this purpose. To date, at least 382 group presentations and 457 individual presentations have been conducted and 3,245 alarms have been installed.

In August 2002, CDC and Georgia State University began to evaluate the effectiveness of the Remembering When program. The evaluation included an examination of knowledge and skills needed to reduce falls and

fires. Preliminary data show significant knowledge increases in areas such as space heater safety, safest clothing to wear, and bathtub falls. The home assessment shows gains in use of bath mats, night-lights, and workable smoke alarms. Manuscripts, including recommendations, are being developed.



Informing consumers about smoke alarm options

CDC has been working with the U.S. Consumer Product Safety Commission, National Institute of Standards and Technology, National Fire Protection Association, Underwriters Laboratories Inc., the U.S. Fire Administration, U.S. Department of Housing and Urban Development, and other partners to evaluate current and prototypic smoke alarm technologies. Researchers have tested the smoke alarm responses to serious residential fires and resistance to nuisance alarms. An official report documenting the findings is available at <http://smokealarm.nist.gov>.

Understanding human behaviors during a residential fire

CDC is directing development of the Human Behavior Fire Study (HBFS), in collaboration with the Battelle Centers for Public Health Research and Evaluation and the University of Maryland's Department of Fire Protection Engineering. This research identifies behavioral factors in residential fires associated with injuries and fatalities. To develop effective public health interventions to reduce the number of fire-related casualties, people's responses to a fire event must be identified and characterized. Researchers will gather detailed data on the sequence of events and behaviors of people involved in fires by interviewing those injured in residential fires or their surrogates. Data to be collected and analyzed include the cause of the fire, behaviors at each point in time following awareness of the fire, and injury outcomes.

CDC-funded research grants

CDC provides grant funding to researchers at universities, medical institutions, and community-based organizations to study various factors related to residential fires. An example of those extramural research projects follows. For more information about grants and other projects, visit www.cdc.gov/ncipc/res-ops/extra.htm.

■ Rural smoke alarm trial.

University of Iowa researchers are comparing the effectiveness of two alternative types of smoke alarms and two different life spans of battery. The primary study outcome is the presence of working smoke alarms. At the start of the study, researchers will install new, battery-powered photoelectric alarms in 400 homes and ionizing alarms in 400 homes. Half the alarms in each group will have alkaline batteries; in

the other half, the alarms will have lithium batteries. After 18 months and 42 months, researchers will revisit the homes to determine which ones still have working alarms.

Future Steps

Efforts to address residential fire-related injuries and deaths in this country must include the following activities:

- Across the country, track the number of homes with sprinkler systems and homes with an adequate number of correctly placed, working smoke alarms; identify communities with legislation and local ordinances related to fire-injury prevention (e.g., requirements for hard-wired smoke alarms and sprinkler systems).
- Expand existing smoke alarm installation and fire safety education programs.
- Apply lessons learned from an evaluation of current programs to increase the effectiveness and efficiency of community-based programs.
- Expand foundational research settings to include apartment buildings and high-rises.
- Research fire prevention technology (e.g., more effective, long-lasting smoke alarms; residential sprinkler systems; safer portable heaters; stoves with automatic shut-off features; and fire-retardant housing materials).
- Perform cost-benefit and cost-effectiveness studies to better understand the economic impact of interventions.

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Road Traffic Safety

The Problem

In a report issued by the World Health Organization (WHO) in 2004, Peden et al. described the severity of the problem:

- Road traffic crashes kill 1.2 million people a year worldwide—an average of 3,242 people every day.
- Road traffic crashes injure or disable 20 million to 50 million people each year.
- Road traffic crashes rank as the 11th leading cause of death and account for 2% of all deaths globally.
- Most road traffic injuries affect people in low- and middle-income countries, especially young males and vulnerable road users such as pedestrians and cyclists.
- By 2020, road traffic injuries are predicted to become the third largest contributor to the global burden of disease.
- The economic cost of road traffic injuries is enormous; worldwide, the cost is an estimated \$518 billion.

CDC's Accomplishments

CDC partners with WHO to celebrate World Health Day 2004: Road Traffic Safety

CDC took an active role celebrating World Health Day 2004, the theme of which was “Road Safety is No Accident.” CDC Injury Center staff represented CDC and the Department of Health and Human Services at key events, including the official WHO launch of the *World Report on Road Traffic Injury Prevention*, held in Paris, and the U.S. launch of World Health Day. Staffers also observed World Health Day by coordinating related events addressing road safety. The theme for CDC's U.S. World Health Day activities, “Family Road Safety: Protect the Ones You Love,” focused on occupant protection, impaired driving, pedestrian safety, and helmet use. CDC distributed more than 3,800

World Health Day information kits, displayed World Health Day banners at injury conferences, and published information about World Health Day and the *World Report* in CDC's *Morbidity and Mortality Weekly Report*, available at www.cdc.gov/mmwr/preview/mmwrhtml/mm5312a1.htm.

World Report on Road Traffic Injury Prevention

CDC researchers participated with WHO to plan, develop, and write the *World Report on Road Traffic Injury Prevention*—the first major report jointly issued by the WHO and the World Bank about road traffic injuries. The report underscores concerns that unsafe road traffic systems (drivers, roads, vehicles) seriously harm global public health and development. The authors contend that the level of road traffic injury is unacceptable and largely avoidable. The report was launched on April 7, 2004, in conjunction with World Health Day.

Future Steps

CDC staff are members of the United Nations (UN) Road Safety Collaboration, a WHO-led initiative to coordinate road safety and health efforts worldwide as specified in the UN

General Assembly resolution 58/289 (improving global road safety) and the World Health Assembly resolution 55.10 (road safety and public health). To support this effort, CDC helped design and field-test injury prevention training curricula for use in developing countries. In the next few years, staff members will work closely with WHO, the Pan American Health Organization (PAHO), and other international organizations to help package and disseminate these curricula (which include road traffic injury surveillance and program evaluation) to developing countries. CDC will continue to work closely with other UN organizations to develop strategies for implementing the recommendations from the 2004 *World Report on Road Traffic Injury Prevention*.

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School Violence

The Problem

- Between 1994 and 1999, 172 students ages 5 to 18 were killed on or near school grounds or at school-related activities (Anderson et al. 2001).
- More than 50% of school-associated violent deaths occur at the beginning or end of the school day or during lunch (Anderson et al. 2001).
- School-associated homicide rates are highest near the start of each school semester; suicide rates are generally higher in the spring semester (CDC 2001).
- Overall, nonfatal violence-related behaviors among high school students in the United States have decreased since 1991 (CDC 2004).
- In a nationwide survey, 12.8% of students had been in a physical fight on school property one or more times in the 12 months preceding the survey (Grunbaum et al. 2004).
 - Among students nationwide, 6.1% reported carrying a weapon (e.g., gun, knife, or club) on school property in the 30 days preceding the survey.
 - Nationwide, 9.2% of students had been threatened or injured with a weapon (e.g., gun, knife, or club) on school property one or more times in the 12 months preceding



the survey. Overall, the prevalence of having been threatened or injured with a weapon on school property was higher among males (11.6%) than females (6.5%).

- Some students nationwide (5.4%) had not attended school at least one of the 30 days preceding the survey because they felt unsafe at school or while en route.

American Medical Association in 2001, show 220 incidents of school violence occurred between July 1, 1994, and June 30, 1999. Most incidents were homicides involving firearms. While the number of incidents has decreased steadily since 1992, the number of multiple-victim incidents has increased. This study plays an important role in monitoring school violence trends, identifying risk factors for school violence, and assessing the effects of prevention efforts.

CDC's Accomplishments

Tracking school-associated violent deaths

With the U.S. Department of Education and U.S. Department of Justice, CDC has conducted a national study of school-associated violent deaths since 1992. The latest findings, published in the *Journal of the*

Multisite project evaluates prevention effort

CDC is funding a multisite trial of a violence prevention program aimed at middle school students. Thirty-seven middle schools in four states are participating. The program being

School-related violent deaths are those that occur on school grounds, on the way to and from school, and on the way to and from school-sponsored activities (Anderson et al. 2001).

evaluated teaches students conflict resolution and problem-solving skills, trains teachers about violence prevention, and engages family members in program activities. The project—affiliated with Virginia Commonwealth University, the University of Illinois at Chicago, the University of Georgia, and Duke University—represents one of the largest efforts to date to assess the effectiveness of school-based violence prevention among middle school students.

National resource center offers wealth of information

The National Youth Violence Prevention Resource Center serves as a central source for information and materials gathered from institutions, community-based organizations, and federal agencies working to prevent violence among our nation's youth. The Center's website, toll-free hotline, and fax-on-demand service offer access to information about prevention programs, publications, research and statistics, and fact sheets. The website links parents, teens, and researchers to materials designed specifically for those audiences. Each month, the Center hosts more than 37,000 website visitors, fulfills more than 500 requests for publications and youth violence prevention materials, and responds to more than 100 public inquiries and requests for technical assistance. For more information, call 1-866-SAFEYOUTH (1-866-723-3968) or visit www.safeyouth.org.

Assessment tool for school environments

CDC is supporting the development of a tool to assess the physical characteristics of schools that can contribute to feelings of safety, increase prosocial behavior, and decrease aggressive behavior. The tool uses the Crime Prevention

Through Environment Design (CPTED) framework. The core principles of CPTED include reducing opportunities for crime, enhancing natural surveillance of activities, and reinforcing a sense that the environment is cared for and that problems will be addressed.

Enhancing State Capacity to Address Child and Adolescent Health Through Violence Prevention (ESCAPE)

CDC's ESCAPE program is designed to develop capacity and leadership in preventing all types of violence toward or among children and adolescents, including school-associated violence. The planning and implementation phases of this project will address shared risk and protective factors for these forms of violence. Colorado, Iowa, Massachusetts, Michigan, Minnesota, New Mexico, Rhode Island, and Virginia have received funding.

Social and character development research program

CDC and the U.S. Department of Education have launched a social and character development research program. Researchers are evaluating the effectiveness of interventions designed to promote positive social and character development, increase positive behaviors, and reduce antisocial behaviors among elementary school children.

Academic centers link researchers and communities

Eight colleges and universities have received CDC funding to establish National Academic Centers of Excellence (ACEs) on Youth Violence. These centers foster joint efforts between university researchers and communities to address the problem of youth violence, including violence at school. For information about specific

Just the Facts . . .

Risk Behaviors Among High School Students

Findings from students surveyed nationwide (Grunbaum 2004):

- 6.1% had carried a weapon (e.g., gun, knife, or club) on school property in the 30 days preceding the survey.
- 9.2% had been threatened or injured with a weapon (e.g., gun, knife, or club) on school property one or more times during the 12 months preceding the survey.
- 12.8% had been in a physical fight on school property one or more times during the 12 months preceding the survey.
- 5.4% had not gone to school on at least one of the 30 days preceding the survey because they felt unsafe at school or while en route.

programs to prevent school violence conducted by the ACEs, visit www.cdc.gov/ncipc/res-opp/ACE/ace.htm.

Collaboration with other parts of CDC

CDC's Injury Center has worked with the Division of Adolescent and School Health, part of CDC's National Center for Chronic Disease Prevention and Health Promotion, on a number of projects related to school violence. Examples of this collaboration follow:

- **School Health Guidelines to Prevent Unintentional Injuries and Violence.** These guidelines help state and local educational agencies and schools promote safety and teach students the skills needed to prevent injuries and violence. Guidance is provided for all components of a coordinated school health program encompassing all grade levels. Specialists from universities and from national, federal, state, and local agencies and organizations collaborated to develop the guidelines. Development was based on in-depth review of research, theory, and current practice in unintentional injury, violence, and suicide prevention; health education; and public health. The guidelines are available at www.cdc.gov/HealthyYouth/injury/guidelines.
- **Healthy Passages.** Healthy Passages is a multiyear longitudinal study to help families, schools, communities, and health care providers understand how children grow to be healthy, educated, and productive members of society. The study will help explain why young people make healthy or risky behavior choices. Data collection, which began in fall 2004, will provide information about injury and violence issues, including individual and family factors associated with bullying and how behaviors change over time.

- **Youth Risk Behavior Surveillance System.** CDC's Youth Risk Behavior Surveillance System (YRBSS) monitors priority health risk behaviors that contribute to the leading causes of death, disability, and social problems among youth and adults in the United States, including behaviors that contribute to unintentional injuries and violence. The YRBSS consists of national, state, and local school-based surveys of representative samples of 9th through 12th grade students. The surveys, conducted biennially, provide information on suicide- and interpersonal violence-related behaviors both on school property and in the community.
- **School Health Policies and Programs Study (SHPPS).** This national survey is conducted periodically to assess school health policies and programs at state, district, school, and classroom levels. SHPPS was first conducted by CDC's Division of Adolescent and School Health (DASH) in 1994 and was repeated in 2000. SHPPS provides information on health education, programs, environmental strategies, and policies that states, districts, and schools use to address violence and suicide prevention.
- **School Health Index.** This self-assessment and planning tool enables a school to identify the strengths and weaknesses of its health and safety policies and programs; to develop an action plan for improving student health and safety; and to involve teachers, parents, students, and the community in improving school services. The third edition of the School Health Index, including unintentional injury and violence prevention items, is available at www.cdc.gov/nccdphp/dash/SHI/index.htm.

Future Steps

CDC's Injury Center works to improve the capacity of local and state authorities, community-based organizations, and private sector partners so they can better support services and policies proven to prevent school violence.

Steps to prevent school violence:

- Continue work with partners such as the U.S. Department of Education and U.S. Department of Justice to better track and monitor school violence.
- Identify factors that increase or decrease risk of school violence.
- Develop and test new strategies to prevent school violence.

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Sexual Violence



Sexual violence includes a wide range of acts that occur in different settings.

There are four types of sexual violence (Basile and Saltzman 2002):

- **Attempted (but not completed) sex act without the victim's consent**, or involving a victim who is unable to provide consent or to refuse.
- **Abusive sexual contact** including intentional touching, either directly or through the clothing, of the genitalia, anus, groin, breast, inner thigh, or buttocks of any person without his or her consent, or of a person who is unable to consent or to refuse.
- **Completed sex act without the victim's consent**, or involving a victim who is unable to provide consent or to refuse. A sex act is defined as contact between the penis and the vulva or the penis and the anus involving penetration, however slight; contact between the mouth and penis, vulva, or anus; or penetration of the anal or genital opening of another person by a hand, finger, or other object.
- **Non-contact sexual abuse** including voyeurism; intentional exposure of an individual to exhibitionism; pornography; verbal or behavioral sexual harassment; threats of sexual violence to accomplish some other end; or taking nude photographs of a sexual nature of another person without his or her consent or knowledge, or of a person who is unable to consent or refuse.

The Problem

- According to the National Violence Against Women Survey, 1 in 6 women and 1 in 33 men in the United States has experienced at least one attempted or completed rape in their lifetime (Tjaden and Thoennes 2000).
- The National Violence Against Women Survey estimates that 302,091 women and 92,748 men were raped in the 12 months prior to the survey. Victims often experience more than one rape. Of those raped in the 12 months preceding the survey, on average, women experienced 2.9 rapes and men experienced 1.9 rapes (Tjaden and Thoennes 2000).
- In 8 of 10 rape cases, the victim knew the perpetrator (Tjaden and Thoennes 2000).
- Fifty-four percent of female rapes occur before age 18; 22% of these rapes occur before age 12 (Tjaden and Thoennes 2000).
- According to the Youth Risk Behavior Survey, a national survey of high school students, about 9% of students report having been forced to have sexual intercourse at some time in their lives. More female students (11.9%) than male students (6.1%) reported having been sexually assaulted. Overall, 12.3% of black students, 10.4% of Hispanic students, and 7.3% of white students reported forced sexual intercourse (Grunbaum et al. 2004).
- A review of state Child Protective Services (CPS) records for child abuse and neglect showed that 88,656 children in the United States experienced sexual abuse in 2001 (ACYF 2004).
- A number of long-lasting physical symptoms and illnesses are associated with sexual victimization including chronic pelvic pain; premenstrual

syndrome; gastrointestinal disorders; and a variety of chronic pain disorders such as headache, back pain, and facial pain. Reproductive and mental health consequences are also associated with sexual victimization (Krug et al. 2002; Campbell and Soeken 1999; Koss and Heslet 1992).

CDC's Accomplishments

Measuring the incidence and prevalence of intimate partner violence and sexual violence

With external partners, CDC has developed two surveys to help states better assess the problem of intimate partner violence, sexual violence, and resulting injuries. The surveys are available as optional modules in the CDC Behavioral Risk Factor Surveillance System. In addition to providing data on the incidence and prevalence of the problem, these surveys will provide knowledge of the related attitudes and norms that allow violence to occur. Data may also be used to compare statistics across states, assess the impact of programs, and guide policy development.

Uniform Definitions and Recommended Data Elements for Sexual Violence

In 2002, CDC published *Sexual Violence Surveillance: Uniform Definitions and Recommended Data Elements* to improve and standardize data collection. In the absence of standards, researchers have used varying terms to describe acts of sexual violence. These inconsistencies have contributed to confusion and a lack of consensus about the magnitude of the problem. Consistent data allow researchers to better gauge the scope of the problem, identify high-risk groups, and monitor the effects of prevention programs.

CHOOSE RESPECT campaign aims to prevent intimate partner and sexual violence

CHOOSE RESPECT, launched May 2006, is a communications campaign that encourages adolescents to develop positive, respectful relationship behaviors. The campaign is designed to reach 11- to 14-year-olds and the caring adults in their lives with prevention messages about choosing respectful, positive relationship behaviors before norms and attitudes that support violence against women are firmly established. Campaign elements include a website, an interactive music video maker, an education video, brochures, posters, cinema slides, and radio and TV spots.

Collaborations to prevent child sexual assault

CDC is funding three state organizations (Prevent Child Abuse Georgia; Project Pathfinder, Inc., in Minnesota; and Massachusetts Citizens for Children) to develop and implement statewide child sexual abuse prevention programs. The programs focus on adult or community responsibility in preventing the perpetration of child sexual assault. The funding supports projects using existing infrastructures to broaden prevention efforts.

Evaluation assistance for projects to prevent first-time male perpetration of sexual violence

CDC has provided evaluation assistance on four projects designed to prevent first-time perpetration of sexual violence by males. As these projects build capacity to conduct their own evaluations independently, CDC will foster project improvements through training and coaching on the use of evaluation concepts, techniques, and findings.

Rape Prevention and Education Program

CDC administers the Rape Prevention and Education (RPE) program and provides technical assistance to health departments, sexual assault coalitions, and other partner organizations or agencies. The RPE program supports educational seminars, hotline operations, training programs for professionals, informational materials, and other efforts to increase awareness of sexual violence, including that perpetrated by intimate partners. Through this program, all 50 states and U.S. territories have implemented prevention and education programs and have developed a stronger infrastructure to address sexual violence.

Rape Prevention and Education program evaluability assessment

To enhance the administration and use of Rape Prevention and Education (RPE) funding, CDC assessed how states allocate RPE funds and the types of activities the funds support. The primary objectives of this study were to document the goals and objectives of the RPE program as it relates to the activities of state health departments and sexual assault coalitions; to assess the allocation mechanisms, uses, and impact of the funds; and to assess the public health needs of states and local programs in terms of knowledge, skills, resources, and barriers to effective implementation. The assessment provided CDC with recommendations which are currently being implemented to improve the administration and efficacy of the RPE program.

Violence against women evaluation guide

CDC developed a *Violence Against Women Evaluation Guide* to help programs develop and implement outcome evaluations. The *Guide* will assist programs in selecting useful, feasible, ethical, and accurate evaluation strategies. It clearly defines evaluation research based on CDC guidelines and provides an

overview of the issues to be considered in evaluating programs to prevent violence against women. Information about data collection methodology and measures, data analyses, presentation of results, and selection of an external evaluator will be included. The *Guide* is expected to be released in 2006.

National Sexual Violence Resource Center

The National Sexual Violence Resource Center (NSVRC) provides information, resources, and research on all aspects of sexual violence. Activities include collecting, reviewing, cataloging, and disseminating information about sexual violence prevention and intervention; coordinating efforts with other organizations; providing technical assistance and customized information; and maintaining a website. The website features links to sexual assault resources and information about upcoming conferences, funding opportunities, job announcements, research, and special events. The NSVRC also produces a biannual newsletter, recommends speakers for conferences, coordinates national sexual assault awareness activities, and identifies emerging policy issues and research needs. The NSVRC serves coalitions, local rape crisis centers, government and tribal entities, colleges and universities, service providers, researchers, allied organizations, policy makers, and the general public (see www.nsvrc.org).

National online resources for violence against women

CDC has funded the Pennsylvania Coalition Against Domestic Violence (PCADV) and the California Coalition Against Sexual Assault (CALCASA) Prevention Connection to provide national, online resources for preventing violence against women. These resources support local, state, national, and tribal agencies and organizations in developing, implementing, and evaluating programs

for violence against women. For more information, visit www.vawnet.org and www.preventconnect.org.

Assessing links between various forms of violence

CDC is conducting a study to identify the links between different forms of violent behaviors among adolescents. The findings will help scientists understand the prevalence and consequences of various aggressive behaviors; the association between dating violence and other forms of peer violence; and the manner in which these types of violent behavior vary by sex, developmental stage, and other factors.

Culturally-competent demonstration projects

CDC funds 10 projects to prevent intimate partner violence and sexual violence among various racial and ethnic populations, including African Americans, American Indians and Alaska Natives, Hispanics, Asians, and Pacific Islanders. These projects have developed and are evaluating programs for children, victims, and perpetrators; programs to prevent dating violence among school-aged youth; and programs that link victims with community-based service providers. The components and outcomes of interest vary by project.

Preventing Violence through Education, Networking, and Technical Assistance (PREVENT)

CDC is funding the University of North Carolina Injury Prevention Research Center to develop a national training program for violence prevention practitioners. The initiative, known as PREVENT (Preventing Violence through Education, Networking, and Technical Assistance), is an outgrowth of the National Injury and Violence Prevention Training Initiative. It is supported by the Society for Advancement of Violence and Injury Research (SAVIR), formerly the National Association of Injury Control Research Centers, and the

Just the Facts . . .

Risk Factors for Perpetration of Rape

Some factors increase the risk that a man will commit rape (Jewkes et al. 2002):

Individual Factors

- Alcohol and drug use
- History of sexual abuse as a child
- Witnessed family violence as a child

Relationship Factors

- Association with sexually aggressive or delinquent peers
- Violent family environment and few resources

Community Factors

- Lack of employment opportunity
- General tolerance of sexual assault within the community

Societal Factors

- Societal norms supportive of sexual violence
- High levels of crime and other forms of violence

State and Territorial Injury Prevention Directors Association (STIPDA). Through PREVENT, individuals and organizations learn to identify community needs and assets; create and mobilize partnerships; develop and implement prevention programs; measure success; and secure funding to sustain programs. PREVENT uses a variety of educational methods including distance-learning modules, regional workshops, an intensive institute, action learning projects, and coaching.

CDC extramural research grants

CDC provides grant funding to researchers at universities, medical institutions, and community-based organizations to study various factors related to sexual violence. A sample of those extramural research projects follows. For more information about these and other projects, visit www.cdc.gov/ncipc/res-opp/extra.htm.

- **Primary prevention of child sexual abuse.** The Medical University of South Carolina is conducting two complementary studies to increase understanding of the effects of a community-based media program aimed at raising awareness of the prevalence and consequences of child sexual abuse and educating the public about related prevention and response strategies. Results from these two studies will inform efforts to prevent child sexual abuse and identify possible strategies for refining prevention messages.
- **Sexual violence prevention program for perpetrators.** This project—a collaboration of the Southern Arizona Center Against Sexual Assault, the Pima County Attorney's Office, and the University of Arizona College of Public Health—is implementing and evaluating a perpetrator-focused sexual violence prevention program. The RESTORE program (Responsibility and Equity for Sexual Transgressions Offering a Restorative Experience) is a restorative justice-based, non-

adversarial, community-conferencing method to adjudicate first arrests for date or acquaintance rape and non-penetration sexual offenses.

- **Risk for sexual abuse: a study of adolescent offenders.** Researchers at the University of Minnesota are working to identify the unique and shared risk factors for child sexual abuse, sexual assault, and youth violence. The study includes 300 adolescent males who have committed sexual abuse of children, peers, or adults; it also includes adolescent males who have committed other nonsexual types of delinquent behavior. Researchers are examining attitudes toward intimate relationships (attachment style) and involvement with peers, including consensual sexual experiences. Attitudes toward masculinity are also being examined (e.g., beliefs about the importance of competition, violence, and face-saving as an indication of masculinity; confidence in one's own masculinity; and beliefs about sexuality, self-reported sexual behavior, and sexual interest and fantasies). Project results will be disseminated in collaboration with Stop It Now! Minnesota.

Future Steps

Like intimate partner violence, sexual violence often goes unreported because of embarrassment, denial, or fear of retaliation, especially when the perpetrator is someone known to the victim. This underreporting masks the magnitude of the problem of sexual assault in the United States. Even when incidents are reported, they may not be identified or recorded as sexual violence. Similarly, victims seeking medical care after rape or sexual assault may not disclose the true cause of their injuries. If they do, the information may not be recorded in the medical record. To better document the scope of the problem of sexual violence and identify trends in incidence and prevalence, we must improve the quality of data collection at national, state, and local levels.

Scientists, public health professionals, advocates, and others must increase efforts to stop sexual violence from occurring. To this end, CDC is supporting the evaluation of interventions to prevent sexual violence so that science-based recommendations about programs and practices that work can be shared.

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Sports- and Recreation-related Injuries

The Problem

- An estimated 7 million Americans seek medical care annually for injuries sustained during sports or recreation (Conn et al. 2003). An estimated 4.3 million of them are treated in emergency departments (Gotsch et al. 2002).
- Adolescents 10 to 14 years of age have the highest rates of sports- and recreation-related injury (Gotsch et al. 2002).
- About one quarter of people injured during sports or recreation miss one or more days of work or school due to the injury (Conn et al. 2003).
- An estimated 1.6 to 3.8 million sports- and recreation-related traumatic brain injuries occur in the United States each year (Langlois et al. 2006).
- Concussions can occur in any sport, including football, wrestling, soccer, basketball, softball, baseball, field hockey, and volleyball (Powell and Barber-Foss 1999).
- Collegiate and high school football players who have had at least one concussion are at an increased risk for another concussion (Guskiewicz et al. 2000; Zemper 2003).

CDC's Accomplishments

Evaluation of an alternative warm-up program

CDC, in collaboration with the National Collegiate Athletic Association, the American Academy of Orthopaedic Surgeons, the International Federation of Football Associations, and the Santa Monica Orthopaedic and Sports Medicine Research Foundation, conducted a randomized controlled trial of an alternative warm-up program to prevent anterior cruciate ligament (ACL) injuries in female soccer players. Women athletes are disproportionately



affected by ACL injuries (Griffin 2001). The research involved implementing and evaluating a physical training program specifically designed to reduce the risk of ligamentous knee injuries by incorporating proven neuromuscular and proprioceptive training concepts into a concise on-field warm-up activity. Results showed that this program reduced the risk of ACL injuries and noncontact ACL injury rates among female soccer players compared with athletes who did not receive the intervention.

Tool kit raises awareness about sports-related concussions

In 2004, CDC developed *Heads Up: Concussion in High School Sports*—a tool kit for high school athletic coaches containing materials about how to prevent, recognize, and manage sports-related concussions. The tool kit will also assist coaches in educating athletes, athletes' parents, and school officials about sports-related concussions. In early 2005, CDC conducted a pilot study to evaluate the tool kit's effectiveness. Of the nearly 500 responses, most were positive—74% found the materials very easy to use,

and 94% said the tool kit had just enough detail. More than two thirds of coaches reported being aware of incidents of sports-related concussions occurring at their schools; one third of the coaches had no access to education materials prior to receiving the tool kit. Also, 20% of coaches reported that their athletic department had no plan for dealing with concussions; however, most coaches (96%) thought the tool kit materials could be used to develop a plan. The revised tool kit, based on findings from the pilot study, now includes a DVD. The tool kit initiative, launched September 2005, distributed tool kits to more than 10,000 coaches, athletic directors, and principals in high schools nationwide. To order free of charge or download materials, visit www.cdc.gov/ncipc/tbi/Coaches_Tool_Kit.htm.

Research illuminates impact of sports- and recreation-related injuries

CDC researchers found that from 1997 through 1999, an estimated 7 million Americans received medical attention for sports- and recreation-related injuries each year. Almost one third

of these injuries occurred at sports facilities, and basketball ranked as the lead sport for injuries among organized and backyard or pickup games. More than two thirds of the people treated for sports- and recreation-related injuries were 5 to 24 years old (Conn et al. 2003).

CDC extramural research grants

CDC funds grants to researchers at universities, medical institutions, and community-based organizations to study various factors related to sports and recreation injuries. An example of those extramural research projects follows. For more information about grants and other projects, visit www.cdc.gov/ncipc/res-opps/extra.htm.

- **Evaluation of existing sports injury interventions and countermeasures in high school varsity football.**

Researchers at the UCLA-Southern California Injury Prevention Research Center are using a multilevel study design to identify primary, secondary, and tertiary prevention measures in place at local high schools; measure whether these interventions affect the frequency and severity of injury; compare treatment protocols across schools; and estimate costs of medically



treated injuries in selected sports clinics. Investigators will focus on two samples of football teams: those that are under medical supervision by a local sports clinic and those that are not.

Future Steps

In 2004, CDC convened a panel of experts to explore potential collaborations for the development of public health surveillance, research, and programming which would promote physical activity while minimizing the risk of injury. This meeting was supported by the National Swimming Pool Foundation. CDC will use the outcomes from this meeting to shape collaborative research and program priorities.

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Suicide

The Problem

Each year in the United States, more people commit suicide than die from homicide.

- In 2002, 31,655 Americans took their own lives, an average of 87 people each day (CDC 2004).
- Completed suicides reflect only a small portion of the impact of suicidal behavior. In 2003, 176,707 individuals were hospitalized following suicide attempts; 130,004 were treated in emergency departments and released (CDC 2004).
- Although females attempt suicide more often than males (DeLeo et al. 2002), males are four times as likely to die from suicide. U.S. statistics for 2002 show that males account for 80% of suicides overall (CDC 2004).
- Suicide is the third leading cause of death among young people ages 15 to 24. In 2001, 4,010 suicides were reported in this age group (Kochanek et al. 2004).
- Suicide rates are highest among those 65 years and older. In 2002, 5,548 Americans over age 65 committed suicide, averaging one suicide every 90 minutes (CDC 2004; DHHS 2001). Men committed 85% of these suicides (CDC 2004).
- In 2002, 56% of suicides were committed with a firearm (Kochanek et al. 2004).

CDC's Accomplishments

Reporting system to provide objective, timely violence data

State and local agencies acquire detailed information from medical examiners, coroners, police, crime labs, and death certificates that could answer fundamental questions about violence trends and patterns. This information is fragmented and difficult to access. Consequently, CDC has funded 17 states—Alaska, California, Colorado, Georgia, Kentucky, Maryland, Massachusetts, New Jersey, New Mexico, North Carolina, Oklahoma, Oregon, Rhode Island, South Carolina, Utah, Virginia, and Wisconsin—to establish the National Violent Death Reporting System (NVDRS) to gather, share, and link state-level data about violence-related deaths. When fully implemented, NVDRS will enable CDC to pull together vital state-level information to gain a more accurate understanding of the problem of violence, including suicide, and to enable policy makers and community leaders to make informed decisions about prevention strategies.

Study tracks school-associated violent deaths

With the U.S. Departments of Education and Justice, CDC is conducting an ongoing national study of school-associated violent deaths. Since 1992, this study has played an important role in monitoring trends related to school-associated violent deaths (including suicide), identifying risk factors, and assessing the effects of prevention efforts.

Integrating data for more accurate suicide measures

CDC has established a Suicide Prevention Research Center at the Trauma Institute of the University of Nevada School of Medicine. The Center has developed a pilot surveillance system to help states



Just the Facts . . .

Suicide Among High School Students

CDC's 2003 nationwide study of high school students revealed alarming responses about suicide (Grunbaum et al. 2004):

- 16.9% had seriously considered suicide during the 12 months preceding the survey;
- 16.5% had made a plan to attempt suicide during the 12 months preceding the survey;
- 8.5% had attempted suicide one or more times during the 12 months preceding the survey; and
- 2.9% had attempted suicide during the 12 months preceding the survey that resulted in injury, poisoning, or overdose requiring medical treatment.



integrate data from death certificates, emergency departments, and mental health departments. This new system provides a more accurate and complete measure of suicide rates than do surveillance

systems that rely on mortality data alone.

Setting uniform definitions for suicide

Standard definitions for suicide do not exist, and the definitions used in federal and state legislation vary dramatically. These inconsistencies contribute to confusion and a lack of consensus about the magnitude of the problem. CDC is convening an expert panel to review the existing state of suicide surveillance and to recommend definitions for use during data collection. Acquiring better data about suicide will shape prevention efforts and help policy makers and communities make informed public health decisions for allocating prevention resources.

Assessing links between various forms of violence

CDC is conducting a study to identify the links between different forms of violent behaviors among adolescents, including suicide. The findings will help scientists understand the prevalence and consequences of different types of aggressive behaviors; the association between dating violence and other forms of peer violence; and the manner in which these types of violent behavior vary by sex, developmental stage, and other factors.

Understanding suicide risk among adolescents

CDC is funding Battelle Centers for Public Health Research and Evaluation to survey high school-aged adolescents from an urban school district. The research will enhance knowledge about youth suicidal behaviors and associated risk and protective factors; create a viable research and clinical instrument to evaluate suicide risk; and examine the utility of this instrument as a screening tool and outcome measure. The goal is to design better preventive interventions and thereby reduce suicide risk.

Partnering in national suicide prevention strategy

CDC plays a key role in the Federal Steering Group for the Surgeon General's National Strategy for Suicide Prevention. This group coordinates federal initiatives to prevent suicide, funds research, supports workshops, and shares information about suicide facts and prevention activities through such channels as public hearings and the Internet. In early 2001, the group published goals and objectives for the strategy, which include promoting awareness about suicide as a preventable public health problem; developing and evaluating prevention programs; improving the portrayal of suicide, mental health, and drug use in the entertainment and news media; promoting research about suicide and its prevention; and enhancing tracking systems for suicide.

Preventing Violence through Education, Networking, and Technical Assistance (PREVENT)

CDC is funding the University of North Carolina Injury Prevention Research Center to develop a national training program for violence prevention practitioners. The initiative, known as PREVENT (Preventing

Violence through Education, Networking, and Technical Assistance), is an outgrowth of the National Injury and Violence Prevention Training Initiative. It is supported by the Society for Advancement of Violence and Injury Research (SAVIR), formerly the National Association of Injury Control Research Centers, and the State and Territorial Injury Prevention Directors Association (STIPDA). PREVENT helps individuals and organizations build skills for identifying community needs and assets, creating and mobilizing partnerships, developing and implementing prevention programs, measuring success, and securing funds to sustain programs. PREVENT uses a variety of educational methods including distance-learning modules, regional workshops, an intensive institute, action learning projects, and coaching.

Multistate assessment of state suicide prevention planning

CDC is conducting an in-depth, multistate examination of the development and implementation of state suicide prevention plans. The findings will help other states develop suicide prevention plans and gain the support of stakeholders so that these plans can be implemented. Insights gleaned from this study will also help inform state-based prevention efforts in other public health problem areas such as violence against women and child maltreatment.

State suicide prevention program implementation

CDC is funding state injury prevention experts in Maine and Virginia to develop evidence-based suicide prevention programs. These experts are designing and implementing a suicide prevention program tailored to the needs of their state.

National resource center offers wealth of information

The National Youth Violence Prevention Resource Center (www.safeyouth.org, 1-866-SAFEYOUTH 1-866-723-3968) is a central source for information and materials gathered from institutions, community-based organizations, and federal agencies working to prevent violence among our nation's youth. The center's website, toll-free hotline, and fax-on-demand service offer access to information about prevention programs, publications, research and statistics, and fact sheets. The website links parents, teens, and researchers to materials designed specifically for those audiences. The Center responds to more than 100 public inquiries and requests for technical assistance, fulfills more than 500 requests for publications and youth violence prevention materials, and hosts more than 37,000 website visitors each month.

Collaboration with other parts of CDC

CDC's Injury Center has worked with the Division of Adolescent and School Health, part of CDC's National Center for Chronic Disease Prevention and Health Promotion, on a number of projects related to suicide prevention. Examples of these collaborations follow.

- **School Health Guidelines to Prevent Unintentional Injuries and Violence.** The guidelines help state and local educational agencies and schools promote safety and teach students the skills needed to prevent injuries and violence. Guidance is provided for all components of a coordinated school health program for all grade levels. The guidelines, developed in collaboration with specialists from universities and from national, federal, state, and

Just the Facts . . .

Risk and Protective Factors for Suicide

(DHHS 1999)

A **risk factor** for suicide is anything that increases the likelihood that people will harm themselves. Risk factors for suicide include:

- Previous suicide attempt(s);
- History of depression or feelings of hopelessness;
- Precipitating events such as the breakup of a relationship;
- Easy access to lethal methods; and
- Isolation, or a feeling of being cut off from other people.

Protective factors buffer people from the risks associated with suicide. Protective factors for suicide include:

- Effective clinical care for mental, physical, and substance abuse disorders;
- Family and community support;
- Support from ongoing medical and mental health care relationships;
- Skills in problem solving, conflict resolution, and nonviolent handling of disputes; and
- Cultural and religious beliefs that discourage suicide and support self-preservation instincts.



local agencies and organizations, are based on an in-depth review of research, theory, and current practice in unintentional injury, violence, and suicide prevention; health education; and public health. The guidelines are available at www.cdc.gov/HealthyYouth/injury/guidelines.

- **Youth Risk Behavior Surveillance System.** CDC's Youth Risk Behavior Surveillance System (YRBSS) monitors priority health risk behaviors that contribute to the leading causes of death, disability, and social problems among youth and adults in the United States, including behaviors that contribute to unintentional injuries and violence. The YRBSS consists of national, state, and local school-based surveys of representative samples of 9th through 12th grade students. The surveys, conducted biennially, provide information on a variety of suicide- and interpersonal violence-related behaviors both on school property and in the community.
- **School Health Policies and Programs Study.** This national survey is conducted periodically to assess school health policies and programs at state, district, school, and classroom levels. School Health Policies and Programs Study (SHPPS) was first conducted by CDC's Division of Adolescent and School Health (DASH) in 1994 and was repeated in 2000. SHPPS provides information about health education, programs, environmental strategies, and policies that states, districts, and schools use to address violence and suicide prevention.

CDC extramural research grants

CDC provides grant funding to researchers at universities, medical institutions, and community-based organizations to study various factors

related to suicide prevention. A sample of those extramural research projects follows. For information about these and other projects, please visit www.cdc.gov/ncipc/res-opps/extra.htm.

- **Help seeking by at-risk youth after suicide screenings.** The Research Foundation for Mental Hygiene, Inc. is conducting a retrospective cohort study of youth identified through screening as at-risk for suicidal behavior. Each at-risk youth and his or her parent will be interviewed about two years after the screen to assess information about the use of services during the intervening period, barriers that may have interfered with seeking or receiving treatment, and the risk status of the youth at follow-up. Findings will guide efforts to develop optimal help-seeking strategies tailored to at-risk youth and their parents to establish effective screening programs to prevent suicidal behavior.
- **Preventing youth suicide in primary care: a family model.** Researchers at Children's Hospital of Philadelphia are testing the efficacy of brief family therapy for adolescents presenting with serious risk for suicide in a primary care setting. The intervention approach will be Attachment-based Family Therapy (ABFT), an efficacious and manualized family therapy model designed specifically for adolescent depression. ABFT has been successful in reducing suicidal ideation, hopelessness, depression, anxiety, and family conflict.

Future Steps

Accurate, timely, and accessible information about suicidal behaviors is crucial for prevention. To better document the scope of the problem, to identify high-risk groups, and to recognize trends in incidence and

prevalence, CDC must refine and validate current definitions of suicide and develop systems to monitor and track the problem.

One of the greatest challenges in suicide prevention is to identify promising strategies and programs. CDC must continue research on effective prevention strategies for suicide and suicidal behavior. CDC must also continue to evaluate current interventions and develop and test new ones. As data become available about what works, we must communicate that information to practitioners.

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Supervision of Children

The Problem

Unintentional injuries are the leading cause of death for children, and many of these injuries can be prevented through appropriate supervision. In 2002, 5,305 children 14 years and younger died from unintentional injuries, and more than 6.5 million were seen in emergency departments. Many studies have described how lapses in supervision lead to injury such as drowning, burns, and poisonings (Pollack-Nelson and Drago 2002; Landen et al. 2003; Simon et al. 2003). The key for preventing many unintentional injury deaths and disabling injuries among children is effective supervision, yet this behavioral component of injury prevention lacks conceptual and methodological clarity. Without this foundation, interventions are difficult to develop and test. CDC's Injury Center is taking the lead in exploring the critical link between supervision and injury prevention.

CDC's Accomplishments

Supervision in injury prevention workshop

CDC sponsored an expert meeting in August 2003 to assess the role of supervision in preventing unintentional injuries among children and to identify areas where more research on supervision is needed. The meeting resulted in several suggestions for developing models of supervision. One priority area for future research is to enhance the evidence base for the role of supervision in injury outcomes.

Disseminating child safety products in urban communities

With CDC support, the hospital-based Children's Safety Center at Johns Hopkins University has launched a traveling Mobile Safety Center. The Mobile Safety Center van travels to clinics and selected sites serving low-income families to conduct safety interventions and to provide parents



with the safety products (e.g., smoke alarms, cabinet latches, stair gates, car seats) they need to better supervise and protect their family. The project has developed training materials, educator protocols, and exhibits to be used by the Mobile Safety Center and the Safety Center clinic. Researchers are evaluating this dissemination strategy compared with others that are clinic based.

Safe Kids at Home

CDC funded SAFE KIDS Worldwide, a global public awareness and education campaign to help prevent unintentional injuries among children 14 and younger. SAFE KIDS Worldwide works with communities in 19 states to develop and disseminate culturally and ethnically diverse home safety educational materials addressing special risks in public housing. In addition to training health department staff and home visiting organizations about home safety and injury prevention, SAFE KIDS Worldwide developed task forces within each community to help sustain the Safe Kids at Home program. Working with their local coalitions, SAFE KIDS Worldwide conducted 26 home safety training workshops for nearly 600 home visitors. During the project, home visitors went to 69,840 homes and installed nearly 57,000 home safety devices, including outlet covers and drawer and cabinet latches. CDC provided additional funding for the development of a low-literacy brochure on home safety and a multimedia train-the-trainer presentation that combines fundamental home safety knowledge with tips for implementing a home safety program.

CDC extramural research grants

CDC provides grant funding to researchers at universities, medical institutions, and community-based organizations to study various factors related to supervision. A sample of those extramural research projects follows. For more information about these and other projects, visit www.cdc.gov/ncipc/res-opps/extra.htm.

- **Concept mapping: an innovative method to measure supervision.** Researchers at the George Washington University School of Public Health and Health Services are using the concept mapping process of brainstorming groups, sorting and rating groups, and discussion and interpretation groups to conceptualize child supervision's role in injury prevention. Concept mapping techniques will enable researchers to explore variations in sociodemographic and parenting style for identifying behaviors central to child supervision, to examine conceptualizations of child supervision with regard to injury mechanisms, and to identify styles and processes of child supervision that are perceived to be amendable to change.
- **Injury risk management for young children.** University of California researchers are developing a model of injury risk management for young children. Using an emergency department-based study about the circumstances of injury, researchers will explore the role of supervision in injury and injury risk management. They will follow a cohort of mothers from their children's births to age 30 months to identify individual factors and the interrelationship between those factors. The measurable components of the research model are management of the environment, supervision, use of resources, and adaptation to changing circumstances and child development. Researchers will use study findings to develop and test a clinical assessment tool to identify families who need help with injury risk management for their children.



- **A dynamic model of supervision and injury among children.** Researchers at the University of Rochester are developing and validating a new, comprehensive, and developmentally sensitive measure of supervision. Researchers seek to expand the current focus on how adults structure supervision (through the creation of rules and the direct monitoring of their children). Researchers also want to learn how adults assess the risk inherent in a situation, how they perceive their role in reducing this risk, and how they implement their approach to supervision. Researchers will develop a self-report measure of this expanded conceptualization of supervision, an observational measure of supervision for parents of preschool children, and a child self-report measure of risk-taking and rule compliance for older children.

Future Steps

Research continues to examine the varied supervisory patterns now in use with children of different ages and of different cultures. Behavioral scientists are collaborating to develop measurement tools to compare these various styles of supervision and to evaluate the relative effectiveness of each in preventing injuries. CDC's Injury Center is taking the lead in this important area of research.

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Teens Behind the Wheel

The Problem

Motor vehicle-related injuries are the biggest health threat to teenagers in the United States, accounting for two out of five deaths overall (CDC 2005).

- In 2002, more than 5,000 teens ages 16 to 19 died of injuries caused by motor vehicle crashes (CDC 2005).
- The risk for motor vehicle crashes is higher among 16- to 19-year-olds than among any other age group. In fact, per mile driven, drivers in this age group are four times more likely than older drivers to crash (IIHS 2004).
- In 2002, the estimated economic cost of police-reported crashes (both fatal and nonfatal) involving drivers ages 15 to 20 was \$40.8 billion (NHTSA 2003).

CDC's Accomplishments

Young drivers and fatal alcohol-related motor vehicle crashes, 1982–2001

CDC researchers found that between 1982 and 2001, alcohol-related fatal crash rates among drivers ages 16 to 20 decreased almost 60%. Although crash rates decreased among drivers of all ages, the most dramatic decreases were among drivers under age 21. This strong downward trend suggests that prevention measures targeting this age group (national minimum legal drinking age and zero alcohol tolerance laws for young drivers) have been effective. However, despite the successes of the last two decades, progress has stalled in the past few years, and impaired driving remains a serious public health problem for drivers of all ages. In 2003 alone, 1 in 4 drivers ages 15 to 20 who died in motor vehicle crashes had a blood alcohol concentration above the legal limit for adult drivers (NHTSA 2004).

Examining parental influence on teen driving behavior

CDC scientists collaborated with the National Institutes of Health to evaluate a brief intervention with parents and teens designed to increase parental restrictions of teen driving privileges. Results showed that the intervention parents reported more driving rules, restricted driving, limits for high-speed roads, weekend night restrictions, and overall driving limits for their teens than did parents in the control group.

Graduated driver licensing

Graduated driver licensing (GDL) programs—which place restrictions on young drivers that are lifted as they gain driving experience—are an effective strategy for developing safe driving skills. CDC supported research at the UCLA Southern California Injury Prevention Research Center to examine the effectiveness of GDL in California. Results from this study showed a 17% to 18% decrease in crash rates for drivers ages 16 to 17 after GDL. CDC also supported and contributed to a special edition of the *Journal of Safety Research* documenting the current research evidence about GDL.

CDC helped fund and contributed to a series of five research papers, published in a September 2002 supplement of *Injury Prevention*. The articles, which reviewed the current status of research on young drivers, make a compelling case for GDL programs.

Effective interventions to prevent alcohol-impaired driving among teens

In systematic reviews of published research studies, a research team led by CDC found evidence that minimum legal drinking age laws and lower BAC laws for young or inexperienced drivers (zero tolerance laws) effectively reduce alcohol-impaired driving. A systematic review of school-based education programs found that such programs reduce the incidence of riding with alcohol-impaired drivers, though there was insufficient evidence that these programs reduced drinking and driving among teens. To learn more about this and other systematic reviews published in *The Guide to Community Preventive Services*, see www.thecommunityguide.org.





Just the Facts . . .

Why Teens are at Risk

Several factors increase a teen's risk for vehicle-related injuries:

- **Inexperience**—Teens often fail to recognize or underestimate the dangers in hazardous situations, and they also have less experience coping with such situations; teens are more likely than older drivers to speed, run red lights, make illegal turns, ride with an intoxicated driver, and drive after using alcohol or drugs (Jonah and Dawson 1987).
- **Low rates of seat belt use**—Compared with other age groups, teens have the lowest rate of seat belt use. In 2003, 18% of high school students reported that they rarely or never wear seat belts when riding in a car as a passenger (CDC 2004).
- **Alcohol and driving**—All 50 states have “zero tolerance” laws that establish a blood alcohol concentration (BAC) limit of 0.02% or lower for drivers under the age of 21. In 2003, 25% of drivers ages 15 to 20 who died in motor vehicle crashes had a BAC of 0.08% or higher, which is above the legal BAC limit for adult drivers (NHTSA 2004). Among teen drivers who were killed in crashes after drinking and driving, 74% were not wearing seat belts (NHTSA 2004).

GDL effect on hospitalization rates and charges for 16-year-old drivers

CDC is funding one of the first studies of the effect of GDL on serious, nonfatal injuries resulting from motor vehicle crashes among 16-year-old drivers. Researchers at the University of North Carolina will examine state crash data and the state's Inpatient Discharge Database to document the rate of hospitalization and associated charges for 16-year-olds from 1996 through 2001, encompassing data after the implementation of the North Carolina GDL program in December 1997. Evidence of GDL's impact on hospitalization rates and charges may assist policy makers and legislators in their efforts to increase the effectiveness of GDL programs.

CDC extramural research grants

CDC provides grant funding to researchers at universities, medical institutions, and community-based organizations to study various factors related to teen drivers. One example of an extramural research project follows. For more information about this and other projects, visit www.cdc.gov/ncipc/res-ops/extra.htm.

- **Behavioral study to reduce youth DUI and risky driving.** Researchers at the University of Alabama at Birmingham are working to better understand two factors associated with the underlying attitudes that lead to teen involvement in motor vehicle-related crashes: risky behavior and driving under the influence (DUI) of alcohol. In one study, researchers will evaluate social and attitudinal influences on DUI among college students before and after exposure to persuasion methods successfully used in antismoking interventions. In a second study, researchers will conduct focus

groups and phone surveys of 16- to 20-year-old drivers to assess their attitudes and normative beliefs that lead to risky driving. Based on this knowledge, researchers will develop interventions oriented toward exploiting group dynamics as opposed to relying on individual education. In both the DUI and risk-taking studies, the interventions will be pilot tested first in a laboratory and later in a real-world environment.

Future Steps

Driving is a complicated skill that takes time and practice to master. Graduated driver licensing, GDL, is one strategy that allows driving skills to be developed with minimum risk of injury. GDL addresses the high risks new drivers face by requiring an apprenticeship of planned and supervised practice, followed by provisional licensure that temporarily restricts unsupervised driving. Restrictions are lifted as new drivers gain experience and teenage drivers mature. Most states now have some form of GDL in place, but the strength of its components varies widely. In itself, GDL is not the final solution to the problem. More research is needed to identify how family, peers, and others influence teen driving behavior.



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Traumatic Brain Injury

The Problem

Traumatic brain injuries (TBI) contribute to a substantial number of deaths and cases of permanent disability. Each year in the United States, an estimated:

- 1.4 million people sustain a TBI. Of them, 235,000 are hospitalized and survive. These rates are more than 20 times the number of hospitalizations for spinal cord injury, another key disabling injury (Langlois et al. 2004; Johnson 2001);
- 1.1 million people who sustain a TBI are treated and released from an emergency department (Langlois et al. 2004);
- 50,000 people die from a TBI (Langlois et al. 2004); and
- 80,000 to 90,000 people experience the onset of long-term or lifelong disability associated with a TBI (Thurman et al. 1999).

Among children ages 0 to 14 years, TBI results in an estimated:

- 2,685 deaths;
- 37,000 hospitalizations; and
- 435,000 emergency department visits (Langlois et al. 2004).

Falls are the leading cause of TBI; rates are highest among children ages 0 to 4 and adults ages 75 or older (Langlois et al. 2004).

Motor vehicle traffic-related causes result in the greatest number of TBI-related deaths and hospitalizations; rates are highest among adolescents ages 15 to 19 (Langlois et al. 2004).

- In almost every age group, TBI rates are higher for men than for women (Langlois et al. 2004).
- People ages 75 years or older have the highest rates of TBI-related hospitalization and death (Langlois et al. 2004).
- African Americans have the highest death rate from TBI (Langlois et al. 2004).
- An estimated 5.3 million Americans—2% of the population—currently live with disabilities resulting from TBI (Thurman et al. 1999).
- About 75% of TBIs that occur each year are concussions or other forms of mild TBI (CDC 2003).
- Direct and indirect costs of TBI were an estimated \$60 billion in the United States in 2000 (Finkelstein et al. 2006).

CDC's Accomplishments

The Children's Health Act of 2000 helps CDC provide continued leadership in the study of TBI. CDC supports multiple projects and programs, including those that monitor TBI, link people with TBI to information and services, and prevent TBI-related disabilities.

Generating national estimates for TBI deaths, hospitalizations, and emergency department visits

CDC supported an analysis of TBI data from its National Center for Health Statistics. This analysis generated national estimates for TBI deaths, hospitalizations, and emergency department visits by sex, age, and geographic region; it also offered information about causes of TBI and average hospital stays for TBI patients. Results of this analysis are the subject of a CDC report, *Traumatic Brain Injury in the United States: Emergency Department Visits, Hospitalizations, and*



A traumatic brain injury (TBI) is caused by a blow or jolt to the head that disrupts the brain's function. The severity of such an injury may range from "mild" (a brief change in mental status or consciousness) to "severe" (an extended period of unconsciousness or amnesia after the injury). Each year, about 75% of TBIs that occur in the United States are concussions or other forms of mild TBI (CDC 2003). Any TBI is considered serious.



Deaths, published in 2004. (The report is available online at www.cdc.gov/ncipc/pub-res/TBI_in_US_04/TBI_ED.htm.) This report is the first of its kind to include detailed national data about TBI in a single-reference document.

Identifying persons with TBI among World Trade Center survivors

CDC conducted a rapid assessment of injuries among survivors of the September 11, 2001, World Trade Center (WTC) attack who were seen in emergency departments; CDC found only a small percentage experienced head injury. Because other injured people may have had an undiagnosed TBI, CDC funded New York City's Department of Health and Mental Hygiene to conduct a retrospective study to identify how many people hospitalized with injury after the WTC attack also may have had a TBI. Researchers reviewed inpatient hospital records that identify possible TBI and describe the cause and nature of injuries. Preliminary findings include a number of cases in which signs and symptoms of TBI were listed in patients' medical records, suggesting a TBI even though it was not diagnosed. Researchers have found that some diagnosed TBIs were the result of falling debris or people being trampled.

Planning the future of TBI registries and data systems

In July 2002, CDC convened an expert panel of TBI researchers, advocates, registry administrators, and other professionals to discuss the future of TBI registries and data systems and to obtain guidance in the development of a national program. The report, *Traumatic Brain Injury in the United States: The Future of Registries and Data Systems*, summarizes recommendations made to CDC by the expert panel and includes information about activities related to the TBI Reauthorization Act and the definition of a TBI registry. This report is available online at www.cdc.gov/ncipc/tbi/RegistriesDataSys.htm.

Highlighting CDC-funded TBI research and programs

The May–June 2005 issue of the *Journal of Head Trauma Rehabilitation*, “TBI in the US: Research and Programs of the CDC,” provides a comprehensive look at CDC-funded activities for TBI at national and state levels. This special issue also addresses public health principles and TBI legislation; TBI surveillance and education; TBI rates among children, older adults, and American Indians/Alaska Natives; TBI-related outcomes, including the risk of death; and linkage to information and services for people with TBI. The publication is available online at the publisher's website: www.lww.com/product/?0885-9701.

Reporting to Congress about mild TBI

The Children's Health Act of 2000 required CDC to report to Congress on how best to measure the rate at which new cases of mild TBI occur and the proportion of the U.S. population that, at a point in time, experiences signs or symptoms of a mild TBI. To that end, CDC formed the Mild TBI Work Group, comprising experts in brain injury, to determine appropriate and feasible methods for assessing the incidence and prevalence of mild TBI in the United States. *Report to Congress on Mild Traumatic Brain Injury in the United States: Steps to Prevent a Serious Public Health Problem*, published in 2003, presents the Mild TBI Work Group's findings and recommendations.

Standardizing facts and information about TBI

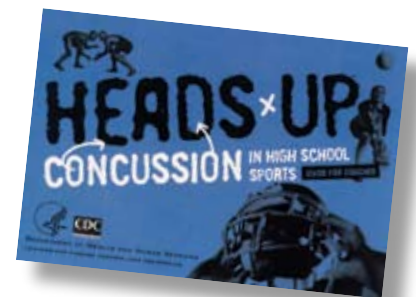
CDC, in collaboration with 10 other TBI agencies and organizations such as the Brain Injury Association of America (BIAA) and the National Association of State Head Injury Administrators (NASHIA), developed a standard TBI fact sheet titled *Facts about Traumatic Brain Injury*. This fact sheet contains up-to-date information

about the incidence, causes, risk factors, and costs associated with TBI. It is available online at www.cdc.gov/ncipc/tbi/FactSheets/Facts_About_TBI.pdf.



Preventing and managing sports-related concussions

In 2004, CDC developed an educational tool kit, *Heads Up: Concussion in High School Sports*, for high school athletic coaches. It contains information about how to prevent, recognize, and manage sports-related concussions. It also contains materials to assist coaches in educating athletes, athletes' parents, and school officials about sports-related concussions. A pilot study, conducted in 2005, evaluated the tool kit's effectiveness. Of the nearly 500 responses, 74% found the materials very easy to use, and 94% said the tool kit had just enough detail. More than two thirds of coaches reported being aware of incidents of sports-related concussions occurring at



their schools, and a third had no access to the materials prior to receiving the tool kit. Also, 20% of coaches reported that their athletic department had no plan for dealing with concussions; however, most coaches (96%) thought the tool kit materials could be used to develop a plan. Most coaches said they would give the materials to parents, athletes, and other school officials. The revised tool kit, based on the pilot study, now includes an instructional DVD.

The tool kit initiative, launched September 2005, distributed tool kits to more than 10,000 coaches, athletic directors, and principals in high schools nationwide. To order free of charge or download materials, visit CDC's website: www.cdc.gov/ncipc/tbi/Coaches_Tool_Kit.htm.

Educating health care professionals about TBI

In January 2003, CDC published and disseminated a TBI tool kit called *Heads Up: Brain Injury in Your Practice*. The tool kit contains practical, easy-to-use clinical information, patient information in English and Spanish, scientific literature, and a CD-ROM. More than 150,000 tool kits have been distributed to health care professionals in the United States and internationally. Although the tool kit was originally developed for physicians, other health care providers such as nurse practitioners and physical therapists have requested the materials. CDC has received positive feedback from more than 2,000 recipients of the tool kit, indicating that it is well received and useful to the intended audience.

Funding researchers to address TBI among children and adolescents

CDC funds TBI research in academic institutions. Results of these projects will inform development of future



programs and policies. Examples of research include the following:

- **Measuring children's health after a TBI.** A TBI can significantly affect a child's health and development. Yet no efficient, standardized method exists to monitor the health of children who sustain a TBI. In 2001, CDC funded Johns Hopkins University to conduct a 3-year study to evaluate different methods for measuring physical and psychosocial health outcomes of children with TBI. Initial findings from this study have been published in a peer-reviewed journal. Validating and adopting a standardized health status survey that is appropriate for large-scale, ongoing surveillance of children's health following a TBI will improve understanding of how these injuries affect children. Such information will inform policy and research initiatives.
- **Developing tools to measure the effects of mild TBI.** CDC is funding a collaborative study between Children's National Medical Center

in Washington, D.C., the University of Pittsburgh Medical Center Sports Medicine Concussion Program, and researchers from Dartmouth College. This study seeks to develop and validate a series of tests for assessing health outcomes of mild TBI among children, adolescents, and teens. It will also document factors that influence the outcome of a mild TBI during the recovery period

Future Steps

TBIs are a major problem with devastating consequences to injured individuals and society at large. The impact of TBI in the United States indicates a need for ongoing monitoring and dedicated prevention efforts. In response to the Children's Health Act of 2000, CDC is moving forward in the following areas:

Conducting a brain injury information center pilot study

CDC funded the Brain Injury Association of America (BIAA) in support of a pilot study to evaluate the development of a national brain

injury information center. The concept behind the information center was to provide persons with brain injury, their families, and agencies that serve them, with information on state-specific resources and available services. The “one-call” information center is being piloted in three states (Michigan, Minnesota, and Mississippi). People in these states who call the BIAA’s toll-free number will be linked automatically to their local Brain Injury Association for confidential and individualized brain injury resources in their state.

Conducting a TBI information and materials needs assessment

CDC is supporting a TBI needs assessment to determine what materials are useful to varied audiences (e.g., health care professionals, educators, patients, families and caregivers, law and policy makers, community-based organizations, and state and local agencies). The project should also provide insight into which current materials reach diverse audiences; determine deficiencies in information, training, education, and available resources; and report on and develop ways to close information and resource gaps.

Producing a concussion tool kit for youth sports

CDC’s tool kit on sports-related concussions, *Heads Up: Concussion in High School Sports*, was distributed to high school athletic coaches across the United States in 2005. Encouraged by positive feedback, CDC is expanding its prevention efforts by addressing another life stage: children who participate in youth sports. The tool kit materials will be revised for youth sports athletes, their parents, and coaches. CDC convened an expert meeting of youth sports leaders and TBI experts to discuss tool kit development and will develop partnerships to ensure effective

distribution. CDC will also evaluate the effectiveness of the materials in raising awareness of sports-related concussion among the target audiences.

Determining TBI prevalence in incarcerated populations

CDC is funding cooperative agreements to develop methods to determine the prevalence of TBI history in an incarcerated population. Anecdotal reports suggest that a large proportion of the prison population may have experienced one or more TBIs. The cognitive deficits that may result often are not visible, and behavioral and emotional problems associated with TBI may be attributed to other causes. Thus, prisoners with TBI or prison officials may not recognize the symptoms and may not seek or provide appropriate treatment. Better methods for identifying incarcerated persons with a history of TBI and related problems could lead to improved management of TBI in this population.

Determining prevalence of TBI-related disability among children and adolescents

CDC plans to support longitudinal research to assess disability and other outcomes, including physical, cognitive, social, emotional, behavioral, and educational, on a population or representative sample of children or adolescents from a geographically defined region or state. Currently, no such study results of TBI outcomes among these groups are available to estimate the prevalence of TBI-related disability nationwide. Estimates of children and adolescents with TBI-associated disability are necessary to document their need for services, help them return to school, and enable them to lead healthy and productive lives.

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Water-related Injuries

The Problem

- In 2002, there were 3,447 unintentional drownings in the United States, averaging nine people per day. This does not include drownings in boating-related incidents (CDC 2004a).
- In 2002, males accounted for 80% of drownings in the United States (CDC 2004a).
- Alcohol use is involved in about 25% to 50% of adolescent and adult deaths associated with water recreation (Howland et al. 1995; Howland and Hingson 1988). Alcohol influences balance, coordination, and judgment, and its effects are heightened by sun exposure and heat (Smith and Kraus 1988).
- Nearly 50% of drowning victims treated in emergency departments need hospitalization or transfer for higher levels of care compared with 3% to 5% of people treated in emergency departments for other reasons (Gilchrist et al. 2004).
- According to the U.S. Coast Guard, 703 people died in recreational boating incidents in 2003 (USCG 2003).
- Up to 70% of boating-related deaths were the result of drowning; 86% of people who drowned were not wearing personal flotation devices (USCG 2003).



CDC's Accomplishments

Research on nonfatal drownings at recreational water sites

In 2004, CDC scientists published the first national estimate of nonfatal drowning injuries treated in emergency departments in the *Morbidity and Mortality Weekly Report*. In the United States in 2001 and 2002, more than 4,100 people sought care in an emergency department each year for nonfatal drowning injuries; more than half required hospital admission or transfer for higher levels of care. Children ages 4 and younger and males of all ages were at greatest risk. The most common locations of nonfatal

injuries for very young children were residential pools. Among older children, more injuries occurred in natural water settings. The study also confirmed that injuries happen most often on weekends and during summer months, when people typically enjoy water-related activities.

Report assesses effectiveness of lifeguards for drowning prevention

Most drownings occur at sites without lifeguards, according to an October 2001 CDC report. This report assessed lifeguard services as a strategy for preventing drowning and water-related injuries. Data for 1988–1997 show more than three



quarters of drownings at United States Lifesaving Association (USLA) sites (mostly ocean beaches) occurred when beaches were unguarded. In contrast, the chance of drowning at a beach where USLA-trained lifeguards are on duty is less than 1 in 18 million. These findings underscore the importance of having trained lifeguards at all beaches where people swim. This report will help communities, local government officials, and owners of private water recreational areas make informed decisions about whether to begin, retain, or discontinue lifeguard services. Additionally, the report describes some environmental modifications that can minimize injury risk. These modifications include creating slope gradients that gradually and smoothly lead to deeper water; prohibiting diving platforms and swim floats; using buoys and markers to delineate the swim area and keep boats out; and ensuring the availability of additional safety measures such as rings, buoy lines, and poles. Finally, comprehensive water safety information campaigns can educate recreational water enthusiasts about their risks and preventive measures.

Three Tragic Seconds: A childhood drowning prevention program

CDC worked with the Children's Hospital of Orange County, California, (CHOC) and the National SAFE KIDS Campaign to implement the Three Tragic Seconds program in two communities in Arizona and Florida. CHOC developed this multimedia educational program to teach parents about drowning prevention. In addition to highlighting appropriate supervision while children are in the water, the program stresses the need for multiple layers of protection (i.e., four-sided isolation fencing, pool alarms, door and gate locks, and door alarms) between small children and residential pools, or other water sites, to prevent

inadvertent exposure. The National SAFE KIDS Campaign evaluated the Three Tragic Seconds program during the summer of 2003. Findings showed that at the end of the program, many participants demonstrated an increased awareness about home safety and the need for adult supervision of children. For many, the program also dispelled common myths surrounding water safety, including the inaccurate belief that air-filled toys are safety devices and the idea that swimming lessons are sufficient to prevent small children from drowning. These findings will guide development of future educational interventions for childhood drownings.

National Safe Boating Week

CDC helped promote boating safety during National Safe Boating Week 2004 (May 22–28) and 2005 (May 21–27). Boating safety is an important public health issue because more than 70 million Americans enjoy recreational boating each year. Plus, annual boat registrations have increased steadily from just over 10 million in 1988 to more than 12.8 million in 2002. During this same time, boating-related fatalities decreased, due in part to increased use of personal flotation devices (life jackets). Still, in 2003, 3,888 participants were reported injured and 703 killed in boating incidents. Among those who died from drowning, about 9 out of 10 were not wearing life jackets. The 2004 North American Safe Boating Campaign focused on raising awareness and ensuring that every person on a boat wears a life jacket. The campaign's theme was "Boat smart. Boat safe. Wear it!"

CDC extramural research grants

CDC provides grant funding to researchers at universities, medical institutions, and community-based organizations to study various factors

Just the Facts . . .

Children and Drowning

Drowning is the second leading cause of injury-related death for children ages 1 to 14 (CDC 2004b).

- In 2002, 904 children ages 0 to 14 died from drowning (CDC 2004b).
- For every child 14 years and younger who drowns, three receive emergency department care for nonfatal submersion injuries. More than 40% of these children require hospitalization (CDC 2004b). Nonfatal incidents can cause brain damage that result in long-term disabilities ranging from memory problems and learning disabilities to the permanent loss of basic functioning (i.e., persistent vegetative state).
- Children under age 1 most often drown in bathtubs, buckets, or toilets (Brenner et al. 2001).
- Among children ages 1 to 4 years, most drownings occur in residential swimming pools (Brenner et al. 2001; Gilchrist et al. 2004). Most young children who drowned in pools were last seen in the home, had been out of sight less than five minutes, and were in the care of one or both parents at the time (Present 1987).
- During 2001–2002, the overall age-adjusted drowning rate for African Americans was 1.4 times higher than for whites. However, these rates vary by age. African-American infants under 1 year had a drowning rate only slightly higher than the rate of white infants. Among children 1 to 4 years of age, African Americans had a lower drowning rate than whites. African-American children ages 5 to 19 drowned at 2.7 times the rate of white children in this age group (CDC 2004b).

associated with water-related injuries. An example of those extramural research projects follows. For more information about this and other projects, please visit www.cdc.gov/ncipc/res-opp/extra.htm.

- **Oceanfront injury prevention.** Researchers at the Eastern Virginia Medical School are creating a community injury prevention model to reduce beach-related injury risk behavior (e.g., leaving children unsupervised, swimming during rough weather). They will develop a multifaceted education intervention by working with members of a coalition that have successfully changed behavior at the community level. Researchers will develop quantitative measures of injury risk that they will use in a pilot study conducted at a single oceanfront beach in Virginia Beach, Virginia.

Future Steps

Additional research, as demonstrated in the following examples, is needed to help answer many remaining questions about the risk factors for drowning and other water-related injuries.

- Evaluate the effectiveness of legislation (e.g., four-sided pool fencing) and community-based programs to prevent drowning.
- Assess levels of water safety knowledge and swimming ability among drowning and near-drowning victims.
- Assess levels of water safety knowledge and swimming skill among the general population and among high-risk groups.
- Describe the frequency and circumstances of water activities among the general population and among various groups.
- Assess the effectiveness of personal flotation devices.



Kids Don't Float program: Photo by Ryan Hill/Alaska Native Tribal Health

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Youth Violence

The Problem

Although homicide rates have dropped in recent years, the rates remain unacceptably high. Homicide rates for young people are higher in the United States than in other developed nations.

- In 2003, 888,508 young people ages 10 to 24 were injured from violent acts. About 1 in 12 required hospitalization (CDC 2004).
- Homicide is the second leading cause of death among young people ages 10 to 24. In this age group, homicide is the third leading cause of death for American Indians/Alaska Natives, the second leading cause of death for Hispanics and Asian/Pacific Islanders, and the leading cause of death for African Americans (CDC 2005).
- In 2002, 5,435 young people ages 10 to 24 were murdered—an average of 15 deaths each day (CDC 2004).
- In 2002, 82% of homicide victims ages 10 to 24 were killed with firearms (CDC 2004).
- Among students surveyed nationwide in a 2003 CDC study (Grunbaum et al. 2004):
 - 17.1% had carried a weapon (e.g., a gun, knife, or club) in the 30 days preceding the survey.
 - 6.1% had carried a gun in the 30 days preceding the survey.
 - 33.0% had been in a physical fight one or more times during the 12 months preceding the survey.
 - 4.2% had been injured in a physical fight one or more times during the 12 months preceding the survey and sustained injuries requiring treatment by a doctor or nurse.

CDC's Accomplishments

Academic centers link researchers and communities

Eight colleges and universities have received CDC funding to establish National Academic Centers of Excellence (ACEs) on Youth Violence. These Centers foster joint efforts between university researchers and communities to address youth violence. The primary objectives of the Centers include monitoring and tracking the problem, researching risk and protective factors, testing prevention strategies, developing multidisciplinary collaborations, providing training, and formulating community-based plans for youth violence prevention. For more information about specific programs conducted by the ACEs, visit www.cdc.gov/ncipc/res-opps/ACE/ace.htm.

National resource center offers wealth of information

The National Youth Violence Prevention Resource Center is a central source for information and materials gathered from institutions, community-based organizations, and federal agencies working to prevent violence among our nation's youth. The Center's website, toll-free hotline, and fax-on-demand service offer access to information about prevention programs, publications, research and statistics, and fact sheets. The website links parents, teens, and researchers to materials designed specifically for those audiences. Each month, the Center responds to more than 100 public inquiries and requests for technical assistance, fulfills more than 500 requests for publications and youth violence prevention materials, and hosts more than 37,000 website visitors. For more information, call 1-866-SAFEYOUTH (1-866-723-3968) or visit www.safeyouth.org.

Youth violence involves the intentional use of physical force or power (threatened or actual) against another person, group, or community that either results in or will likely result in injury, death, psychological harm, maldevelopment, or deprivation.



Multisite project evaluates prevention effort

CDC is funding a multisite trial of a violence prevention program aimed at middle school students. Thirty-seven middle schools in four states are participating. The program being evaluated teaches students conflict resolution and problem-solving skills, trains teachers about violence prevention, and engages family members in program activities. The project—affiliated with Virginia Commonwealth University, the University of Illinois at Chicago, the University of Georgia, and Duke University—represents one of the largest efforts to date to assess the effectiveness of school-based violence prevention among middle school students.

Study tracks school-associated violent deaths

With the U.S. Department of Education and U.S. Department of Justice, CDC has conducted a national study of school-associated violent deaths since 1992. The latest findings, published in the *Journal of the American Medical Association* in 2001, show 220 incidents of school violence occurred between July 1, 1994, and June 30, 1999. Most incidents were homicides involving firearms. While the number of incidents has decreased steadily since 1992, multiple-victim incidents have increased. This study plays an important role in monitoring trends in school violence, identifying risk factors for school violence, and assessing the effects of prevention efforts.

Reporting system to provide objective, timely violence data

State and local agencies acquire detailed information from medical examiners, coroners, police, crime labs, and death certificates that could answer fundamental questions about violence trends and patterns. However, the information is fragmented and difficult to access. CDC has funded 17 states—Alaska, California, Colorado, Georgia, Kentucky, Maryland, Massachusetts, New Jersey, New Mexico, North Carolina, Oklahoma, Oregon, Rhode Island, South Carolina, Utah, Virginia, and Wisconsin—to establish the National Violent Death Reporting System (NVDRS) to gather, share, and link state-level data about violence. When fully implemented, NVDRS will enable CDC to pull together vital

state-level information to gain a more accurate understanding of violence and to enable policy makers and community leaders to make informed decisions about violence prevention strategies and programs, including decisions that address youth violence.

Sourcebook guides community efforts to prevent youth violence

Best Practices of Youth Violence Prevention: A Sourcebook for Community Action was published in 1999 to help communities develop and implement youth violence prevention programs. The sourcebook presents four key strategies for preventing youth violence: school-based programs, mentoring programs, parenting and family-based programs, and home visitation. The sourcebook builds on lessons learned from the first CDC-funded evaluation projects and draws on the expertise of more than 100 of the nation's leading scientists and practitioners. *Best Practices* is also available in Spanish.

Sociocultural and community risk and protective factors for child maltreatment and youth violence

CDC is funding researchers at the University of Georgia to examine the sociocultural and community risk and protective factors associated with child maltreatment and early risk factors for youth violence. Previous research has described the importance of such factors as access to social capital, community social organization, economic and family resources, residential instability, and community and family violence. However, limited information is available about how these and other risk and protective factors might affect child maltreatment and the early developmental risk factors for youth violence. The results from this research will inform the development of violence prevention strategies for communities.

Assessing links between various forms of violence

CDC is conducting a study to identify the links between different forms of violent behaviors among adolescents. The findings will help scientists understand the prevalence and consequences of different types of aggressive behaviors; the association between dating violence and other forms of peer violence; and the manner in which these types of violent behaviors vary by sex, developmental stage, and other factors.

Youth violence prevention through community-level change

CDC is funding the University of Michigan to evaluate the Youth Empowerment Solutions for Peaceful Communities (YES) project. The project aims to reduce rates of youth violence in communities through interventions designed to change community structures and social processes. The YES project provides opportunities for youth that will prevent or reduce youth violence and initiate positive community change. For example, YES helps neighborhood organizations engage youth in activities that focus on changing their social and physical environments.

Assessment tool for school environments

CDC is supporting the development of a tool to assess the physical characteristics of schools that can contribute to feelings of safety, increase prosocial behavior, and decrease aggressive behavior. The tool uses the Crime Prevention Through Environment Design (CPTED) framework. The core principles of CPTED are to reduce opportunities for crime, to enhance natural surveillance of activities, and to reinforce a sense that the environment is cared for and that problems will be addressed.

Compendium of assessment tools

CDC has updated *Measuring Violence-related Attitudes, Behaviors, and Influences Among Youths: A Compendium of Assessment Tools*. The compendium provides researchers and prevention specialists with measures to assess the factors associated with youth violence and to evaluate prevention programs. This publication may be ordered online at www.cdc.gov/injury.

Preventing Violence through Education, Networking, and Technical Assistance (PREVENT)

CDC is funding the University of North Carolina Injury Prevention Research Center to develop a national training program for violence prevention practitioners. The initiative, PREVENT, is an outgrowth of the National Injury and Violence Prevention Training Initiative. It is supported by the Society for Advancement of Violence and Injury Research (formerly the National Association of Injury Control Research Centers) and the State and Territorial Injury Prevention Directors Association. PREVENT helps individuals and organizations build skills to identify community needs and assets; to create and mobilize partnerships; to develop and implement prevention programs; to measure success; and to fund and sustain programs. PREVENT uses many educational methods including distance-learning modules, regional workshops, action learning projects, coaching, and an intensive institute.

Association between exposure to media violence and youth violence

CDC is funding Internet Solutions for Kids, Inc., in Irvine, California, and the University of Michigan to study how media violence, particularly violence in new media such as the Internet and video games, affects youth violence. Researchers are examining

Just the Facts . . .

Key Risk Factors for Youth Violence

Using the public health approach, one of the first steps toward preventing violence is to identify and understand the factors that place young people at risk for violent victimization and perpetration. Research shows that some individual and social factors can increase the probability of violence during adolescence and young adulthood:

Individual

- History of early aggression
- Beliefs supportive of violence
- Social cognitive deficits

Family

- Poor monitoring or supervision of children
- Exposure to violence
- Parental drug or alcohol abuse
- Poor emotional attachment to parents or caregivers

Peer/School

- Association with peers engaged in high-risk or problem behavior
- Low commitment to school
- Academic failure

Neighborhood

- Poverty and diminished economic opportunity
- High levels of transience and family disruption
- Low community participation

the association between exposure to media violence and serious violent behavior, assessing the aspects of media that contribute to the risk of violence, and identifying factors that mediate or moderate the association between media violence and violent behavior.

Enhancing State Capacity to Address Child and Adolescent Health Through Violence Prevention (ESCAPE)

CDC's ESCAPE program is designed to develop capacity and leadership in preventing all types of youth violence. The planning and implementation phases of this project will address shared risk and protective factors. To date, Colorado, Iowa, Massachusetts, Michigan, Minnesota, New Mexico, Rhode Island, and Virginia have received funding.

Social and character development research program

CDC and the U.S. Department of Education have launched a social and character development research program. Researchers are evaluating the effectiveness of interventions designed to promote positive social and character development, increase positive behaviors, and reduce antisocial behaviors among elementary school children.

Collaboration with other parts of CDC

CDC's Injury Center has worked with the Division of Adolescent and School Health (DASH), part of CDC's National Center for Chronic Disease Prevention and Health Promotion, on projects related to youth violence. Examples of this collaboration follow:

- **School Health Guidelines to Prevent Unintentional Injuries and Violence.** State and local educational agencies and schools use these guidelines to promote safety and to teach students the skills needed to prevent injuries and violence.

The components for a coordinated school health program are addressed for all grade levels. Specialists from universities and from national, federal, state, and local agencies and organizations collaborated to develop the guide. Development was based on in-depth review of research, theory, and current practice in unintentional injury, violence, and suicide prevention; health education; and public health. The guidelines are available at www.cdc.gov/healthyyouth/injury/guidelines.

- **Healthy Passages.** Healthy Passages is a multiyear longitudinal study to help families, schools, communities, and health care providers understand how children grow to be healthy, educated, and productive members of society. The study will help explain why young people make choices that lead to healthy or risky behaviors. Data collection, which began in fall 2004, will provide information about varied injury and violence issues including individual and family factors associated with bullying and how behaviors change over time.
- **Youth Risk Behavior Surveillance System.** CDC's Youth Risk Behavior Surveillance System (YRBSS) monitors priority health risk behaviors that contribute to the leading causes of death, disability, and social problems among adolescents and adults in the United States, including behaviors that contribute to unintentional injuries and violence. The YRBSS consists of national, state, and local school-based surveys of representative samples of 9th through 12th grade students. The surveys, conducted biennially, provide information on varied suicide- and interpersonal violence-related behaviors both on school property and in the community.

- **School Health Policies and Programs Study (SHPPS).** This national survey is conducted periodically to assess school health policies and programs at state, district, school, and classroom levels. SHPPS was first conducted by CDC's Division of Adolescent and School Health (DASH) in 1994 and was repeated in 2000. SHPPS provides information about health education, programs, environmental strategies, and policies that states, districts, and schools use to address violence and suicide prevention.
- **School Health Index.** This self-assessment and planning tool enables schools to identify the strengths and weaknesses of its health and safety policies and programs; develop an action plan for improving student health and safety; and involve teachers, parents, students, and the community in improving school services. The third edition of the School Health Index, including unintentional injury and violence prevention items, is available at www.cdc.gov/nccdphp/dash/SHI/index.htm.

CDC extramural research grants

CDC provides grant funding to researchers at universities, medical institutions, and community-based organizations to study various factors related to youth violence. A sample of those extramural research projects follows. For information about these and other projects, please visit www.cdc.gov/ncipc/res-opp/extra.htm.

- **Intentional injury among urban youth.** Harvard University researchers are studying 5,000 males and females, ages 2, 5, 8, 11, 14, and 17, residing in 80 neighborhoods in Chicago. These children and their caregivers will be assessed

twice during home-based sessions to determine the source, frequency, and severity of intentional injury and the consequences of such injury on their physical, psychological, social, and academic functioning. Participants will also be interviewed about gun ownership (self and family), gun carrying, and reasons for gun ownership. These data are being collected as part of an ongoing study of the neighborhoods, schools, families, and personal risk factors for violence.

- **Youth employment and youth violence.** Is work a viable intervention? Researchers at the University of North Carolina at Chapel Hill are examining whether youth employment has promise as a potential intervention to reduce youth violence. This project uses data collected from the National Longitudinal Study of Adolescent Health, based on a nationally representative sample of more than 10,000 adolescents who completed in-home interviews over a six-year period. Investigators are examining the relationship between employment during adolescence and violent (i.e., assault, fighting, threatening with weapons) and violence-related behaviors (i.e., drug and alcohol use, stealing, weapon carrying, gang membership).

Future Steps

CDC has identified promising interventions to prevent youth violence; however, more strategies are needed for community-level interventions. CDC must continue to build on the prevention knowledge base by identifying the best ways to disseminate and encourage adoption of effective strategies.

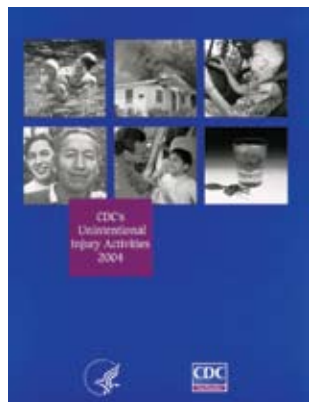
CDC's experience in studying suicide, family violence, and youth violence provides a unique environment for understanding the shared factors contributing to different forms of violence. CDC and its partners must examine these common links to develop broad prevention strategies.

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Publications and Resources

Each year, CDC's Injury Center staff contribute to publications for researchers and professional health practitioners and for the general public. The list of government publications, books, conference proceedings, and journal articles are extensive. Examples of publications follow and, unless otherwise noted, these resources are available by visiting the Injury Center's website, www.cdc.gov/injury, or by calling 1-800-CDC-INFO.



Activity Report 2004: CDC's Unintentional Injury Prevention Program

Unintentional injuries are a leading cause of death for all Americans, regardless of age, race, gender, or economic status. The Division of Unintentional Injury and Prevention, part of CDC's Injury Center, has produced a report detailing its achievements to prevent such injuries. *CDC's Unintentional Injury Activities 2004* highlights the agency's research and programmatic accomplishments for 2002–2004 in the areas of motor vehicle and home and recreation injury.

Atlas of Injury Mortality Among American Indian and Alaska Native Children and Youth, 1989–1998

Injuries, from both unintentional and intentional causes, are third behind heart disease and cancer as the leading cause of death among all American Indians and Alaska Natives (Native Americans). This Atlas presents injury mortality data from 1989 through 1998 for Native American children and youth ages 0 to 19 years residing in the 12 Indian Health Service areas.

Bibliography of Behavioral Science Research in Unintentional Injury Prevention

The *Bibliography of Behavioral Science Research in Unintentional Injury Prevention* includes more than 900 citations of journal articles, book chapters, government reports, and other publications. Designed as a tool for researchers, practitioners, and students, this bibliography documents the contributions of behavioral and social sciences to unintentional injury prevention and control from 1980 through 2003. The publication includes the complete bibliography in two formats: alphabetical by author and by injury topic. Citations are also indexed by keyword.

Brain Injury Association of America Family Helpline www.biausa.org 1-800-444-6443 (toll free)

The Brain Injury Association of America's Family Helpline receives about 15,000 calls each year from individuals with brain injury and from family members and providers seeking assistance, education, and support. For many, the Family Helpline is the first point of contact and support during the difficult times following a brain injury.

CDC Injury Research Agenda

The *CDC Injury Research Agenda* is a blueprint to prevent injuries and resulting disabilities, deaths, and costs. Initially published in 2002, the Agenda identifies CDC's highest priorities for key areas of injury prevention and control—those research issues that CDC must address to fulfill its public health responsibilities. Research areas include transportation; sports, recreation, and exercise; youth violence; suicidal behavior; intimate partner violence, sexual violence, and child maltreatment; and acute care, disability, and rehabilitation. The *Agenda* was developed with extensive input from national nonprofit organizations, CDC's academic research centers, and other federal agencies with a stake in injury prevention.

In 2003, the Injury Center identified gaps in the area of acute injury care and updated the *Agenda* to clearly state CDC's highest priorities for acute care research. By defining research needs, CDC expects to maximize efficient and effective use of resources and encourage collaboration among researchers and practitioners.



CDC School Health Index

The *School Health Index (SHI) Self-Assessment & Planning Guides* are self-assessment and planning tools that elementary and middle/high schools can use to improve health and safety policies and programs. CDC developed these guides in partnership with parents, school health experts, school administrators and staff, and national nongovernmental health and education agencies. Each *SHI* is structured around CDC's research-based guidelines for school health programs, which identify the policies and practices most likely to be effective in improving youth health risk behaviors.

CDCynergy: Violence Prevention Edition

CDCynergy is a multimedia CD-ROM used for planning, managing, and evaluating public health communication programs tailored to the specific needs of an issue or audience. This edition of CDCynergy is ideal for those interested in developing prevention programs about child abuse, intimate partner violence, sexual violence, and youth violence. Included on the CD-ROM are guidelines on how to conduct focus groups; case examples of how other organizations have planned, implemented, and evaluated violence-prevention campaigns; and examples of existing media campaign materials (radio and television PSAs, posters, brochures) from across the violence prevention spectrum.

Central Nervous System Injury Surveillance Data Submission Standards

This publication guides users in collecting, formatting, evaluating, and submitting data to CDC. It updates sections from the *2001 Annual Data Submission Standards Central Nervous System Injury, Guidelines for the Surveillance of Central Nervous System Injury* (published in 1995); sections from the 1999 TBI Surveillance

Grantees' Meeting; and parts of the 1999 Technical Reference Document related to data processing and submission.

Costs of Intimate Partner Violence Against Women in the United States

Recognizing the need to better measure both the scope of the problem of intimate partner violence (IPV) and resulting economic costs—in particular, those related to health care—Congress funded CDC to obtain national estimates of the occurrence of IPV-related injuries, to estimate the cost to our health care system, and to recommend strategies to prevent IPV and its consequences. The publication includes estimates of incidence, prevalence, and costs of nonfatal and fatal IPV; identifies future research needs; and highlights CDC's research priorities for IPV prevention.

Heads Up: Brain Injury in Your Practice Tool Kit

At least 1.4 million people sustain traumatic brain injuries in this country every year. Of them, about 1.1 million, or 75%, sustain a mild traumatic brain injury (MTBI). Yet, many are not hospitalized or receive no medical care. CDC, working with a number of partners, has developed a physician tool kit to improve clinical diagnosis and management of MTBI. Physicians can play a key role in reducing the occurrence of MTBI by educating patients and the community about risks and injury prevention.

Heads Up: Concussion in High School Sports Tool Kit

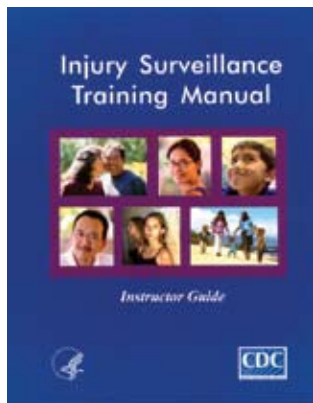
Concussions can happen to any athlete, male or female, in any sport. An estimated 1.6 to 3.8 million Americans sustain sports- and recreation-related traumatic brain injuries every year. Athletic directors, trainers, and coaches can learn to recognize, help prevent,



and manage concussion properly when it occurs. Working with a number of notable partner organizations, CDC developed a tool kit on concussion for high school coaches, athletes, and parents. The kit contains a video featuring a young athlete disabled by concussion; practical, easy-to-use information for coaches; posters; facts sheets for parents and athletes in English and Spanish; and a CD-ROM with downloadable kit materials and additional concussion-related resources.

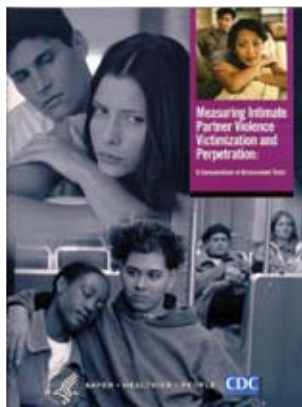
Información Acerca de la Lesión Cerebral Leve

Facts About Concussion and Brain Injury: Where to Get Help is now translated for the Spanish-speaking population. This 18-page brochure is written for Spanish-speaking people with brain injuries and for the family members or caregivers of these individuals. The brochure provides information about brain injury, symptoms of brain injury, tips for healing, and resources. The brochure also highlights a Spanish-speaking helpline, managed by the Brain Injury Association of America, where individuals can access more information and resources. Members of the Latino community, comprised of varied ethnic origins and backgrounds, were involved in the development, design, and translation of this brochure.



Injury Surveillance Training Manual

The *Injury Surveillance Training Manual* is designed primarily for professionals who develop or operate surveillance systems and conduct prevention activities in less-resourced countries. It describes the steps needed to establish and maintain an injury surveillance system; provides information on designing and monitoring prevention activities; and offers guidance for making informed decisions about injury prevention. The curriculum emphasizes basic epidemiological skills needed to conduct surveillance and prevention activities; participation by different sectors and institutions in injury prevention efforts; and injury surveillance and prevention activities at the local level. The manual is available on CD-ROM in English and Spanish; the CD-ROM includes Instructor and Participant Guides, PowerPoint presentations for each session, and data for session exercises.



Measuring Intimate Partner Violence Victimization and Perpetration: A Compendium of Assessment Tools

CDC's *Measuring Intimate Partner Violence Victimization and Perpetration: A Compendium of Assessment Tools* will provide researchers and prevention specialists with a set of assessment tools that have already demonstrated reliability and validity for measuring the self-reported incidence and prevalence of intimate partner violence and perpetration. Though the compendium will include more than 20 scales, it is not intended to be an exhaustive listing of available measures. The information will help researchers and practitioners make informed decisions when choosing scales to use in their work. The compendium will be available in late 2006.

Measuring Violence-related Attitudes, Behaviors, and Influences Among Youths: A Compendium of Assessment Tools

CDC has revised and updated *Measuring Violence-related Attitudes, Behaviors, and Influences Among Youths: A Compendium of Assessment Tools*. The compendium provides researchers and prevention specialists with measures to assess the factors associated with youth violence and to evaluate prevention programs.



National Online Resource Center on Violence Against Women (VAWnet)

The National Online Resource Center on Violence Against Women (VAWnet) supports the development, implementation, and maintenance of effective violence against women intervention and prevention efforts at national, state, and local levels. VAWnet provides a collection of full-text, searchable electronic resources on domestic violence, sexual violence, and issues related to state domestic violence and sexual assault coalitions, allied organizations, and the general public. It provides useful links; monitors news coverage of violence against women issues; offers calendars of trainings, conferences, and grant deadlines; and presents information about Domestic Violence Awareness Month (DVAM) and Sexual Assault Awareness Month (SAAM). For more information, visit www.vawnet.org.

National Sexual Violence Resource Center
1-877-739-3895 (toll-free)

This resource center provides comprehensive information about sexual violence and emerging policy on sexual violence and prevention. It also provides technical assistance to sexual assault programs, state and local organizations, community volunteers, and the media. The resource center plays an important role in compiling, synthesizing, and distributing research and evaluation findings. For more information, access the center's website at www.nsvrc.org.

National Youth Violence Prevention Resource Center
1-866-SAFEYOUTH (toll-free)

People interested in learning more about preventing youth violence and suicide can start with this resource center that combines information gathered from institutions, community-based organizations, and federal agencies. Its website, toll-free hotline, and fax-on-demand service offer access to prevention program information, publications, research and statistics, and fact sheets. Separate portals exist for parents, teens, and researchers. To view the website, go to www.safeyouth.org.

Poison emergency hotline
1-800-222-1222 (toll-free)

This nationwide toll-free poison hotline automatically connects callers to their local poison centers. Calls are routed by the area code and exchange of the caller's phone number. The helpline is available 24 hours a day, 7 days a week, and is staffed by poison experts such as nurses, pharmacists, and doctors. In most cases, a poison exposure problem can be resolved over the phone with the advice from the poison center specialist. If hands-on medical treatment is necessary, the poison center will call an ambulance and give treatment advice to the emergency care providers. Poison

experts responding to hotline calls help prevent poisonings by answering a wide range of questions about drug interactions, household dangers, and insect bites.

Preventing Violence Against Women: Program Activities Guide

About 1.5 million women are raped or physically assaulted by an intimate partner each year. This guide describes CDC's public health activities and research to prevent violence against women. It outlines five categories of activities which are key to CDC's prevention work: tracking the problem, developing and evaluating prevention strategies, supporting and enhancing prevention programs, providing prevention resources, and encouraging research and development.

Preventing Violence Through Education, Networking and Technical Assistance

PREVENT is a national training program for violence prevention practitioners that helps individuals and organizations build skills in identifying community needs and assets, create and mobilize partnerships, develop and implement prevention programs, measure success, and fund and sustain programs. Varied educational methods are used, including distance-learning modules, regional workshops, an intensive institute, action learning projects, and coaching. For information about PREVENT, visit www.prevent.unc.edu.

Prevention Connection: The Violence Against Women Prevention Partnership

Prevention Connection features a Listserv and bimonthly Web-based forums designed to build the capacity of local, state, national, and tribal agencies and organizations to develop, implement, and evaluate effective violence against women prevention initiatives. The Prevent-Connect Listserv provides a vehicle for ongoing

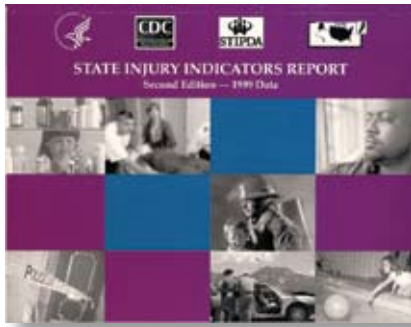
analysis and discussion of domestic and sexual violence prevention efforts. The forums feature a variety of prevention experts exploring prevention approaches and comprehensive solutions to domestic and sexual violence. Prevention Connection is a project of the California Coalition Against Sexual Assault. For more information, visit www.calcasa.org.

Report to Congress on Mild Traumatic Brain Injury in the United States: Steps to Prevent a Serious Public Health Problem

CDC formed the Mild Traumatic Brain Injury (MTBI) Work Group, comprised of experts in the field of brain injury, to determine appropriate and feasible methods for assessing the incidence and prevalence of MTBI in the United States. After numerous discussions and thorough review of the scientific literature, the work group reported their findings and recommendations. Their report describes the public health significance of MTBI and recommends how to better measure the magnitude of the problem in this country.

Sexual Violence Surveillance: Uniform Definitions and Recommended Data Elements

Sexual violence is a significant public health problem in the United States. Measuring the problem can be difficult because of inconsistencies in terminology and data elements for sexual violence. Without consistency, trends cannot be monitored or tracked to determine the extent of the problem. To address this issue, CDC's Injury Center consulted with researchers and practitioners to develop these recommendations for standardizing definitions and data elements for sexual violence surveillance. Policy makers, researchers, public health practitioners, victim advocates, service providers, media professionals, and others interested in better quality and timely incidence and prevalence estimates will find this publication useful.



State Injury Indicators Report, 2nd Edition—1999 Data

CDC's Injury Center, the Council of State and Territorial Epidemiologists, and the State and Territorial Injury Prevention Directors Association have published the second edition of the *State Injury Indicators Report (SIIR)* with 1999 data. The *SIIR* compiles injury data voluntarily collected by 26 state health departments. It consolidates data from hospital records, death certificates, and several national surveillance systems to provide the rates of various injuries (such as traumatic brain injuries, fire and burn injuries, and suicide) and related factors (such as seat belt and smoke alarm use). Findings are also categorized by sex and age. *SIIR* findings can help states determine priorities for their injury prevention programs and identify prevention needs. These surveillance data can also be used to evaluate the effectiveness of program activities and to identify problems needing further investigation.

State Injury Profiles

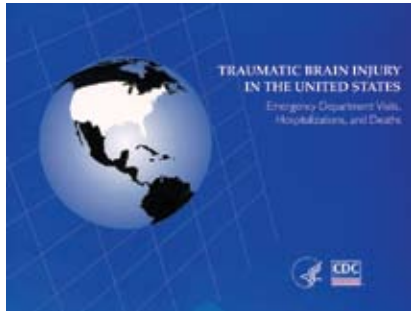
Gathering and sharing reliable data about the broad range of public health problems are among the many ways CDC protects the safety and health of Americans. Through maps and graphs, each *Profile* shows how a state compares with others in the nation, how its mortality rates compare with the United States as a whole, and what injury problems are most pressing. Each *Profile* shows a state's death rates from falls, poisoning, drowning, suffocation, fires and burns, suicide, homicide, traumatic brain injury, and injuries related to firearms. The ten leading causes of death in the United States are shown for each state along with county-by-county maps showing locations with higher death rates for each type of injury. The *Profiles* include links to state and local health departments and descriptions of CDC-sponsored injury prevention programs and research activities in each state.

Tools to prevent older adult falls

For millions of older Americans, falls are a serious health threat. In the United States, 1 in 3 adults ages 65 or older will fall each year. Among older adults, falls are the leading cause of injury deaths and the most common cause of injuries and hospital admissions for trauma. CDC has released new educational materials to help older adults prevent falls. Through a partnership with the CDC Foundation and the MetLife Foundation, two CDC brochures, *What You Can Do to Prevent Falls* and *Check for Safety: A Home Fall Prevention Checklist for Older Adults*, were updated, redesigned, and translated into Spanish and Chinese.



- *What You Can Do to Prevent Falls* focuses on four key messages that research shows are effective in preventing falls: begin a regular exercise program; have your health care provider review your medicines; have your vision checked; and make your home safer. Posters that promote these four fall prevention activities were created and are available in English, Spanish, and Chinese.
- *Check for Safety: A Home Fall Prevention Checklist for Older Adults* helps people identify possible fall hazards and suggests solutions. The brochure uses a question and answer format to guide people through each room of their home.



Traumatic Brain Injury in the United States: Emergency Department Visits, Hospitalizations, and Deaths

This report addresses the incidence and prevalence of traumatic brain injury (TBI) in all age groups in the general population of the United States, providing detailed information about TBI-related deaths, hospitalizations, and emergency department visits from 1995 through 2001. These data address the number of TBIs occurring each year, who is affected, and how TBIs occur.

Traumatic Brain Injury in the United States: The Future of Registries and Data Systems

In response to the Children’s Health Act of 2000, CDC convened an expert panel to discuss the future of TBI registries and data systems, providing guidance for CDC to develop a national program. This report summarizes the expert panel’s recommendations for funding states to collect, analyze, and report TBI surveillance data; using existing national data sets to estimate the impact of TBI; and enhancing systems to identify and contact people with TBI, linking them with needed services. This report will help policy makers, researchers, advocates, public health professionals, and health



department officials further the development of systems to collect data about people with TBI.

Using Evidence-based Parenting Programs to Advance CDC Efforts in Child Maltreatment Prevention—Research Brief 2004

This brief summarizes several CDC prevention initiatives aimed at encouraging and promoting positive parent-child interactions. By acquiring positive parenting skills, parents and caregivers can better manage children’s behavior and prevent violence before it occurs. The initiatives resulted from extensive strategic planning and consultation with child maltreatment prevention experts.



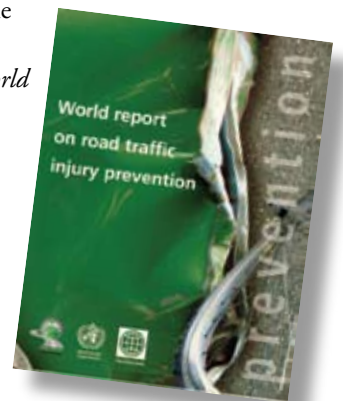
WISQARS
www.cdc.gov/ncipc/wisqars
WISQARS

(pronounced “whiskers”), the Web-based Injury Statistics Query and Reporting System, is an interactive database of injury morbidity and mortality data. Created by CDC’s Injury Center, WISQARS offers prompt, customized reports about both unintentional and violent injuries, including leading causes of death reports, leading causes of nonfatal injury reports, and years of potential life lost reports. Data are updated each year in the fall. Tutorials, frequently asked questions, and a help file ensure that users obtain the data they need.



World Report on Road Traffic Injury Prevention

To raise awareness that road traffic injuries kill more than one million people and injure tens of millions more every year, on World Health Day 2004, the World Health Organization (WHO) and the World Bank released the *World Report on Road Traffic Injury Prevention*. CDC’s Injury Center staff collaborated with WHO to produce the *World Report*. More than 30,000 copies were distributed; it was translated into nine languages; and shortly after its release, a Congressional Caucus on global road safety was launched. In 2004, the *World Report* won the United Kingdom’s coveted HRH Prince Michael (of Kent) Premier International Road Safety Award.



Websites

CDC's Injury Center website: www.cdc.gov/injury

CDC's website offers powerful data tools and quality information critical to injury and violence prevention and control efforts. In addition to WISQARS and Injury Maps (see Data Sharing, page 18), the website's offerings include:

- **E-mail list:** CDC's Injury Center reaches out to partners through its announcement e-mail list. Subscribers are notified of funding announcements and career opportunities. To stay informed, subscribe online at www.cdc.gov/ncipc/email_list.htm.
- **Fact sheets and topics:** The Injury Center regularly updates and expands fact sheets and topic information highlighting relevant statistics, descriptions of related CDC activities, prevention tips, and resources.
- **Programs and projects:** Highlighting grantee accomplishments, this section summarizes and profiles CDC-funded injury and violence programs and projects. Profiles feature grantee contact information, goals, and achievements (injury-related research, publications, and conferences).
- **Publications:** CDC's Injury Center offers a variety of publications about injury and violence prevention for public health and safety professionals, clinicians, and the public. The publications are available for online viewing or downloading, and many are available for ordering in hard copy.

The websites listed below can be found in the *CDC Injury Fact Book*. For more valuable links that address injury and violence prevention, please visit CDC's Injury Center online.

Academic Centers of Excellence

www.cdc.gov/ncipc/res-ops/ACE/ace.htm

American Association of Poison Control Centers

www.aapcc.org

American Red Cross "Preparedness Today"

www.redcross.org/preparedness/cdc_english/CDC.asp

American Trauma Society (Trauma Information and Exchange Program, TIEP)

www.amtrauma.org

Brain Injury Association of America

www.biausa.org

California Coalition Against Sexual Assault (Prevention Connection project)

www.calcasa.org

CDC Emergency Preparedness and Response

www.bt.cdc.gov

CDC Healthy Youth (School Health Index, School Health Policies and Programs Study, and other resources)

www.cdc.gov/HealthyYouth

CDC Injury Center Extramural Research Projects and Grants

www.cdc.gov/ncipc/res-ops/extra.htm

Guide to Community Preventive Services

www.thecommunityguide.org

Morbidity and Mortality Weekly Report (includes other publications and state health statistics)

www.cdc.gov/mmwr

National Council on Aging: Center for Healthy Aging ("Falls Free" initiative)

www.healthyagingprograms.org

National Highway Traffic Safety Administration

www.nhtsa.dot.gov

National Institute of Standards and Technology: Fire Research (home smoke alarm tests)

<http://smokealarm.nist.gov>

National Resource Center for Safe Aging

www.safeaging.org

National Sexual Violence Resource Center

www.nsvrc.org

National Youth Violence Prevention Resource Center

www.safeyouth.org

PREVENT (Preventing Violence through Education, Networking and Technical Assistance)

www.prevent.unc.edu

Prevent Child Abuse America

www.preventchildabuse.org

Society for Advancement of Violence and Injury Research

www.savirweb.org

Violence Against Women (national resources)

www.vawnet.org

Toll-free Phone Numbers

These toll-free numbers are provided in the *CDC Injury Fact Book* and are just a few of the many resources available on the Injury Center's website.

American Association of Poison Control Centers
1-800-222-1222

Brain Injury Association of America Family Helpline
1-800-444-6443

National Child Abuse Hotline
1-800-4-A-CHILD
(1-800-422-4453)

National Domestic Violence Hotline
1-800-799-SAFE
(1-800-799-7233)

National Sexual Violence Resource Center
1-877-739-3895

National Suicide Hotline
1-800-SUICIDE
(1-800-784-2433)

National Youth Violence Prevention Resource Center
1-866-SAFEYOUTH
(1-866-723-3968)

Poison Emergency Hotline
1-800-222-1222

Rape, Abuse, and Incest National Network (RAINN) Hotline
1-800-656-HOPE
(1-800-656-4673)

CDC-INFO is CDC's toll-free public information contact center. CDC-INFO call center representatives are available 24 hours a day, 7 days a week, and answer public inquiries in English and Spanish. This center allows CDC to quickly provide information to health professionals, the public, and others. Please contact CDC-INFO for your public health information needs.

CDC-INFO Contact Center
1-800-CDC-INFO (1-800-232-4636)
E-mail: cdcinfo@cdc.gov
Website: www.cdc.gov

CDC Health Protection Goals

Healthy People in Every Stage of Life

All people, and especially those at greater risk of health disparities, will achieve their optimal lifespan with the best possible quality of health in every stage of life.

Healthy People in Healthy Places

The places where people live, work, learn, and play will protect and promote their health and safety, especially those at greater risk of health disparities.

People Prepared for Emerging Health Threats

People in all communities will be protected from infectious, occupational, environmental, and terrorist threats.

Healthy People in a Healthy World

People around the world will live safer, healthier and longer lives through health promotion, health protection, and health diplomacy.