IN 1997, 32,436 deaths resulted from firearm-related injuries, making such injuries the second leading cause of injury mortality in the United States after motor-vehicle-related incidents. Also in 1997, an estimated 64,207 persons sustained nonfatal firearm-related injuries and were treated in U.S. hospital emergency departments (EDs); approximately 40% required inpatient hospital care. National firearm-related injury and death rates peaked in 1993, then began to decline. This report presents national data from 1993 through 1997, which showed that the decline in nonfatal and fatal firearm-related injury rates was substantial and consistent by sex, race/ethnicity, age, and intent of injury.

A firearm-related injury was defined as a penetrating injury or gunshot wound from a weapon that uses a powder charge to fire a projectile (e.g., handguns, rifles, and shotguns). Data on nonfatal firearm-related injuries treated in U.S. hospital EDs were obtained from the National Electronic Injury Surveillance System (NEISS) of the U.S. Consumer Product Safety Commission. NEISS is a stratified probability sample of hospitals in the United States that have at least six beds and provide 24-hour emergency care. Each firearm-related injury treated in a NEISS hospital ED was assigned a sample weight; the weights were summed to provide national estimates of nonfatal injuries. In 1997, the number of participating NEISS hospitals increased from 91 to 101; therefore, for this analysis, national estimates of nonfatal injuries for prior years were statistically adjusted to account for the sampling frame update. Data on firearm-related deaths were obtained through death certificate data from CDC’s National Center for Health Statistics, and population estimates were from the Bureau of the Census.

To examine trends in nonfatal firearm-related rates by intent of injury, sample weights for cases with unknown intent (i.e., 13.4% of nonfatal injuries during the 5-year period) were allocated to one of the three known categories—assault/legal intervention, intentionally self-inflicted, or unintentional injury. This allocation accounted for the quarterly variation in the percentage of weighted cases with unknown intent during the study period, ranging from 7.1% to 17.7%. Cases with unknown intent were allocated within each quarter based on the weighted distribution of cases with known intent for that quarter. Although the percentage of firearm-related deaths with unknown intent was minimal (i.e., 1.2% of deaths during the 5-year period), these cases also were allocated to maintain consistency.

National estimates of nonfatal firearm-related injuries, their standard errors, and 95% confidence intervals (CIs) for the percentage decline in rates were computed using SUDAAN software to account for the sample weights and the complex survey design of NEISS. For firearm-related deaths, standard errors of death rates were computed assuming deaths follow a Poisson probability distribution so that CIs for the percentage decline in rates accounted for random variation. Multiple linear regression was performed to test for quarterly trends over the 5-year period.

Overall, annual nonfatal and fatal firearm-related injury rates declined consistently from 1993 through 1997. The annual nonfatal rate decreased 40.8%, from 40.5 per 100,000 (95% CI = 22.6-58.4) in 1993 to 24.0 per 100,000 (95% CI = 13.8-34.1) in 1997. This decline was accompanied by a decrease of 21.1% in the annual death rate from 15.4 per 100,000 (95% CI = 15.2-15.5) in 1993 to 12.1 per 100,000 (95% CI = 12.0-12.3) in 1997.

The declines in nonfatal and fatal firearm-related injury rates generally were consistent across all population subgroups. The declines in nonfatal and fatal injury rates were similar for males (40.7% for nonfatal, 20.9% for fatal) and for females (42.1% for nonfatal, 23.2% for fatal). Declines in death rates for blacks and Hispanics were similar, and were both greater than the decline observed for non-Hispanic whites. For nonfatal injury rates, no consistent pattern was found in the estimated decline across age groups, but for fatal injury rates, age and percentage change were inversely related. With respect to intent, the declines in nonfatal injury rates were seen in assault-related, intentionally self-inflicted, and unintentional firearm-related injuries. However, the declines in homicide and unintentional injury death rates were approximately three times greater than that of the suicide rate.

Overall, quarterly fatal and nonfatal firearm-related injury rates showed statistically significant downward trends over the 5-year period adjusting for seasonal changes (overall predicted percentage declines were 36.6% and 17.3% for nonfatal and fatal injury rates, respectively, from first quarter 1993 through fourth quarter 1997; p<0.01 for both). For males aged 15-24 years, quarterly assaultive firearm-related injury rates also declined significantly from 1993 through 1997 (overall predicted percentage declines were 37.5% and 16.0% for nonfatal and fatal injury rates, respectively, from first quarter 1993 through fourth quarter 1997; p<0.01 for both). For females aged 15-24 years, the cyclical seasonal pattern was consistent for both fatal and nonfatal
assaultive firearm-related injury rates, with the highest rates occurring during July, August, and September. These summer rates were significantly higher than rates during the other three quarters for fatal injuries (p < 0.01) but not for nonfatal injuries (p = 0.17).

Reported by: Office of Statistics and Programming and Div of Violence Prevention, National Center for Injury Prevention and Control, CDC.

CDC Editorial Note: The overall percentage decline in nonfatal and fatal firearm-related injury rates in the U.S. population from 1993 through 1997 is consistent with a 21% decrease in violent crime during the same time. Since 1950, unintentional fatal firearm-related injury rates have declined. NEISS data also suggest a decline since 1993 in the rate of nonfatal unintentional firearm-related injuries treated in hospital EDs. Most of these nonfatal injuries occurred among males aged 15-44 years, were self-inflicted, and were associated with hunting, target shooting, and routine gun handling (i.e., cleaning, loading, and unloading a gun). Additional investigation should focus on factors that may have contributed to the decrease, such as gun safety courses and information campaigns, the proportion of the population that uses guns for recreational purposes, and legislation.

Numerous factors may have contributed to the decrease in both nonfatal and fatal assaultive firearm-related injury rates. Possible contributors include improvements in economic conditions; the aging of the population; the decline of the crack cocaine market; changes in legislation, sentencing guidelines, and law-enforcement practices; and improvements associated with violence prevention programs. However, the importance and relative contribution of each of these factors have not been determined, and the reasons are not known for the declines in firearm-related suicide and suicide attempt rates.

This analysis also indicates that using NEISS is an effective means for tracking national estimates of nonfatal firearm-related injuries. Quarterly nonfatal firearm-related injury rates based on NEISS data track closely with firearm-related death rates based on death-certificate data. For males aged 15-24 years, a known high-risk group for assaultive injury, both fatal and nonfatal quarterly assaultive firearm-related rates show cyclical seasonal trends over the 5-year study period, with the highest rates occurring during the summer months.

A limitation of NEISS is that it is not designed to provide data to examine trends at the state and local level. State and local data are needed for jurisdictions to design and evaluate firearm-related injury-prevention programs. CDC has collaborated with states and communities to design and implement successful firearm-related injury surveillance and data systems, which can serve as models for future efforts.

Although firearm-related injuries have declined substantially across all intent categories and population subgroups, recent school-related shootings, multiple shootings, and homicide-suicide incidents are reminders that firearm-related injuries remain a serious public health concern. Even with the significant declines in nonfatal and fatal firearm-related injury rates, approximately 96,000 persons in the United States sustained gunshot wounds in 1997. However, results from the Youth Risk Behavior Survey also indicate a decline in violence-related behavior among high school students, including a 25% decline in carrying guns on school property and a 9% decline in engaging in a physical fight on school grounds during this 3-year period. Prevention efforts should continue to design, implement, and evaluate public health, criminal justice, and education programs to further reduce firearm-related injuries in the United States.

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Influenza and Pneumococcal Vaccination Rates Among Persons With Diabetes Mellitus—United States, 1997

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VACCINATION IS AN IMPORTANT PUBLIC health intervention for reducing morbidity and mortality from influenza and pneumonia among persons with diabetes. A national health objective for 2000 is to increase influenza and pneumococcal vaccination rates to ≈60% among persons at high risk for complications from influenza and pneumonia, including persons with diabetes (objective 20.11). Although the Advisory Committee on Immunization Practices (ACIP) recommends that all persons with diabetes be vaccinated, data from the 1993 Behavioral Risk Factor Surveillance System (BRFSS) showed that 40% of persons with diabetes reported receiving an influenza vaccination within the previous year, and 21% reported ever receiving a pneumococcal vaccination. To assess the vaccination rates among persons with diabetes in 32 reporting areas (i.e., 50 states, the District of Columbia, and Puerto Rico), CDC and the Council of State and Ter-
BRFSS is an ongoing, state-based, random-digit-dialed telephone survey of non-institutionalized civilian adults aged ≥18 years. The analysis included only respondents who answered “yes” to the question, “Has a doctor ever told you that you have diabetes?” Women who were told they had diabetes only during pregnancy were not classified as having diabetes. In 1997, influenza and pneumococcal vaccination rates for the 52 reporting areas were examined; 7011 respondents with diabetes from the reporting areas were included in this analysis. Responses for two questions related to vaccination status were analyzed: “During the past 12 months, have you had a flu shot” and “Have you ever had a pneumonia vaccination?” Of the 7011 respondents, 181 (2.6%) and 384 (5.5%) did not report or did not know their influenza and pneumococcal vaccination status, respectively, and were excluded from the analysis. Data from all of the reporting areas were analyzed to determine sociodemographic characteristics associated with receipt of influenza and pneumococcal vaccinations. Racial/ethnic groups other than non-Hispanic whites, non-Hispanic blacks, and Hispanics were not included because numbers, when presented separately, were too small for meaningful analysis. Data were weighted by age, sex, and racial/ethnic distribution to reflect the adult population of each of the 52 reporting areas. SUDAAN was used to calculate point estimates, 95% confidence intervals (CIs), and significant differences (p<0.05).

Among adults with diabetes, 52.1% reported receiving influenza vaccine during the previous 12 months, and 33.2% reported ever receiving pneumococcal vaccine. Non-Hispanic whites were significantly more likely to report receiving influenza and pneumococcal vacci-
Vaccination rates varied substantially among reporting areas, perhaps because of differences in demographic distribution, provision of adult vaccination programs, physician practice patterns, access to health care, and patient attitudes. CDC is evaluating these patterns to learn why they occur and how reporting areas with low coverage levels can improve them.

The findings in this analysis are subject to at least two limitations. First, persons residing in nursing homes and in households without telephones were not included in this survey; therefore, these results cannot be generalized to these segments of the population. Second, because data were self-reported, they are subject to recall bias. Self-report of diabetes and of influenza vaccination are highly accurate, but self-report of pneumococcal vaccination may be less accurate than self-report of influenza vaccination.

Most reporting areas did not meet the national vaccination objectives among their populations with diabetes. Recognizing the importance of preventive-care practices in reducing morbidity and mortality among persons with diabetes, CSTE has recommended that receipt of preventive-care practices among persons with diabetes, including influenza and pneumococcal vaccination, be placed under national public health surveillance.

CDC and other federal agencies have implemented the Diabetes Flu/Pneumococcal Campaign entitled “Diabetes. One Disease. Many Risks.” Through state-based diabetes-control programs (DCPs), the campaign encourages persons with diabetes to receive influenza and pneumococcal vaccinations. DCPs are implementing health systems-based interventions to encourage health-care professionals to recommend influenza and pneumococcal vaccinations. Because persons with diabetes report a high rate of routine medical care, these interventions can have a large impact on improving vaccination rates. Interventions that include standing orders for vaccination, using provider and patient recalls and reminders, and feedback on vaccination levels have been shown to be effective in increasing vaccination rates. In addition, opportunities for vaccination outside of traditional health-care settings should be extended to persons with diabetes who routinely do not have access to traditional health-care facilities. Additional information about the Diabetes Flu/Pneumococcal Campaign is available from the World-Wide Web at http://www.cdc.gov/diabetes/projs/cdc-flu.htm and http://www.cdc.gov/diabetes/states/states.htm.

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Internet Availability of Tobacco Industry Documents

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An estimated 27 million pages of tobacco industry documents are now accessible through the CDC World-Wide Web site, http://www.cdc.gov/tobacco/industrydocs/. Users can conduct full-text searches of key documents, including the Minnesota Select Set and a special subset of British American Tobacco® documents stored in Guildford, England. The CDC website is the only place where the entire index of documents housed at the Minnesota Tobacco Document Depository is merged and available online in a searchable format.

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