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MORBIDITY AND MORTALITY WEEKLY REPORT

Workers' Memorial Day — April 28, 1998

April 28, 1998, has been designated Workers' Memorial Day to recognize persons who have died from occupational injuries or diseases and opportunities to prevent these deaths. During 1980–1994, a total of 88,622 workers in the United States died from work-related injuries; in 1992, costs of such injuries were an estimated $145 billion (*1*). An estimated additional 60,000 workers died from occupational diseases.

Additional information about causes and prevention of work-related injury and disease is available from CDC's National Institute for Occupational Safety and Health (NIOSH), telephone (800) 356-4674; or on the World-Wide Web http://www.cdc.gov/niosh/homepage.html.

Reference

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Fatal Occupational Injuries — United States, 1980–1994

CDC's National Institute for Occupational Safety and Health (NIOSH) monitors occupational injury deaths through death certificates compiled for the National Traumatic Occupational Fatalities (NTOF) surveillance system* (*1*). Previous reports analyzed data from 1980–1989 (*1–3*). This report updates these estimates on the magnitude of work-related injury deaths for the United States from 1980 through 1994, the most recent year for which data are available from this system, and identifies high-risk industries and occupations at national and state-specific levels. The findings indicate that the annual total number of deaths and crude death rates decreased from 7405 (7.5 per 100,000 workers) in 1980 to 5406 (4.4 per 100,000 workers) in 1994.

National death rates were calculated using denominators from employment data from the Current Population Survey, a population-based household survey of the Bu-

*NTOF is based on death certificates compiled from 52 vital statistics reporting units in the United States. Inclusion criteria for death certificate submission to the NTOF database include 1) age ≥16 years; 2) external cause of death (*International Classification of Diseases, Ninth Revision*, codes E800–E999); and 3) "injury at work" designation.

Fatal Occupational Injuries — Continued

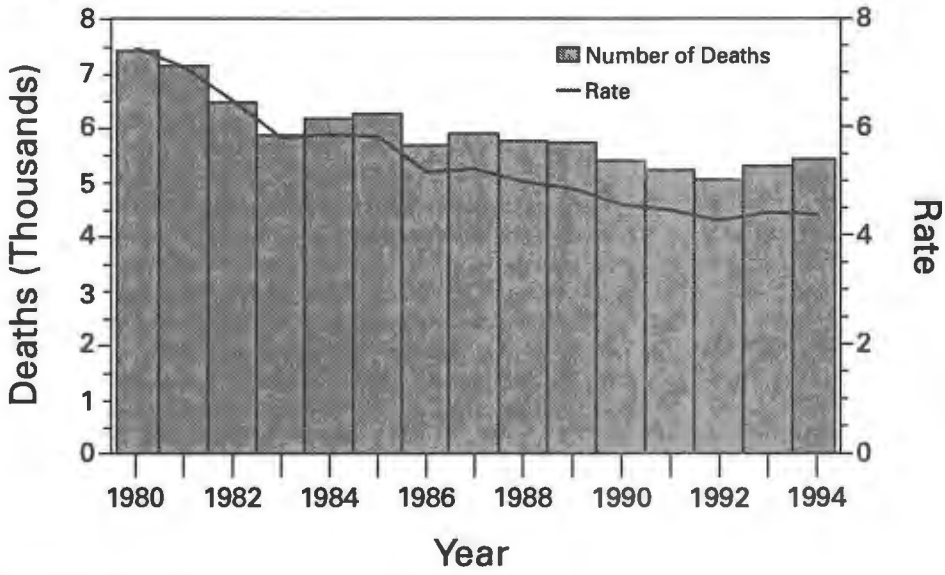
reau of Labor Statistics (BLS) (*4*). Deaths among military workers were excluded from the analyses because the employment data do not include military employment numbers. Crude death rates per 100,000 workers were calculated as the number of deaths among civilian workers for each year divided by the number of employed civilians for each year. Because published estimates for employment by state exclude self-employed workers and report government workers separately, computerized data files obtained from the 1990–1994 BLS Current Population Survey monthly employment files (*5*), which include self-employed and government workers by industry categories, were used to calculate death rates by state.

National Estimates, 1980–1994

From 1980 through 1994, a total of 88,622 civilian workers died in the United States from occupational injuries, an average of 16 work-related deaths per day. The annual total number of deaths declined 27%, from 7405 in 1980 to 5406 in 1994 (Figure 1). The average rate for occupational injury deaths for all workers decreased 41%, from 7.5 per 100,000 workers in 1980 to 4.4 per 100,000 workers in 1994 (Figure 1). Motor-vehicle–related deaths,† the leading cause of death for U.S. workers since 1980 (Figure 2), accounted for 23.1% of deaths during the 15-year period. Homicides became the second leading cause of occupational injury deaths in 1990 (13.5% of occupation-related deaths), surpassing machine-related deaths (13.3% of total).

†The category of motor-vehicle–related deaths includes crashes occurring on and off the roadway, pedestrians struck by motor vehicles, noncollision incidents (e.g., falls from buses or cars), incidents involving off-road motor vehicles (e.g., snowmobiles or all-terrain vehicles), and incidents involving other road vehicles (e.g., bicycles).

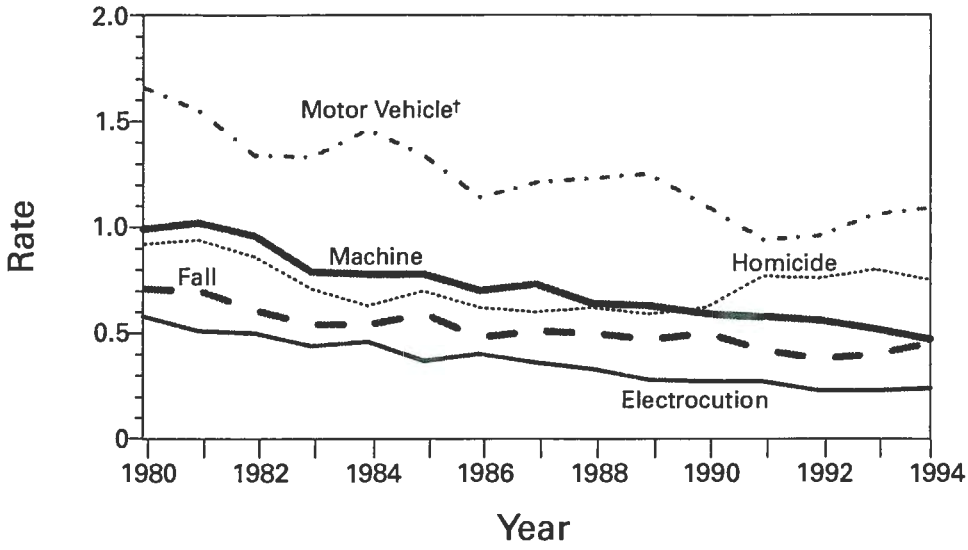
FIGURE 1. Number and rate* of occupational injury deaths, by year — United States, 1980–1994



*Per 100,000 workers.

Fatal Occupational Injuries — Continued

FIGURE 2. Rates* for leading causes of occupational injury deaths, by cause and year — United States, 1980–1994



*Per 100,000 workers.
†The category of motor-vehicle–related deaths includes crashes occurring on and off the roadway, pedestrians struck by motor vehicles, noncollision incidents (e.g., falls from buses or cars), incidents involving off-road motor vehicles (e.g., snowmobiles or all-terrain vehicles), and incidents involving other road vehicles (e.g., bicycles).

The industries in which the largest numbers of deaths occurred during this period were construction (16,091 deaths [18.2%]), transportation/communication/public utilities (15,668 [17.7%]), and manufacturing (12,371 [14.0%]). Industries with the highest death rates per 100,000 workers were mining (30.5), agriculture/ forestry/fishing (20.5), and construction (15.5). The occupation categories in which the largest numbers of deaths occurred were precision production/crafts/repairers (17,392 [19.6%]), transportation/material movers (16,134 [18.2%]), and farmers/foresters/ fishers (10,960 [12.4%]). Occupation categories with the highest death rates per 100,000 workers were transportation/material movers (23.0), farmers/foresters/fishers (20.7), and handlers/equipment cleaners/helpers/laborers (15.1).

State Estimates, 1990–1994

From 1990 through 1994, motor-vehicle–related incidents were the leading cause of occupational death in 38 states (Table 1). Machine-related incidents were the leading cause of death in five states; homicides, in three states and the District of Columbia; falls, in two states; and water transport and struck by falling objects, one state each. The construction industry accounted for the largest number of work-related deaths in 19 states; manufacturing, in 12 states; agriculture/forestry/fishing, in 11 states; transportation/communication/public utilities, in five states; retail trade, in one state and the District of Columbia; services, in one state; and mining, in one state.

Fatal Occupational Injuries — Continued

TABLE 1. Leading causes of occupational injury deaths and major industry and occupation categories with highest numbers and rates of death, by state — United States, 1990–1994

State	Leading cause	Industry		Occupation	
		Highest no.	Highest rate	Highest no.	Highest rate
Alabama	Motor vehicle*	Manufacturing	Mining	Crafts†	Transport§
Alaska	Water transport	Ag/For/Fish¶	Ag/For/Fish	Farm/For/Fish**	Farm/For/Fish
Arizona	Struck by falling	Construction	Mining	Crafts	Transport
Arkansas	Motor vehicle	Manufacturing	Ag/For/Fish	Transport	Transport
California	Homicide	Service	Mining	Crafts	Transport
Colorado	Motor vehicle	TCPU††	Ag/For/Fish	Crafts	Farm/For/Fish
Connecticut	Motor vehicle	Manufacturing	Ag/For/Fish	Crafts	Transport
Delaware	Motor vehicle	Manufacturing	Ag/For/Fish	Crafts	Farm/For/Fish
District of Columbia	Homicide	Retail trade	Construction	Services	Laborers
Florida	Motor vehicle	Construction	Ag/For/Fish	Crafts	Transport
Georgia	Motor vehicle	Construction	Ag/For/Fish	Crafts	Transport
Hawaii	Motor vehicle	Construction	Ag/For/Fish	Crafts	Transport
Idaho	Motor vehicle	Ag/For/Fish	Ag/For/Fish	Farm/For/Fish	Transport
Illinois	Motor vehicle	Construction	Ag/For/Fish	Crafts	Farm/For/Fish
Indiana	Motor vehicle	TCPU	Ag/For/Fish	Transport	Farm/For/Fish
Iowa	Machine	Ag/For/Fish	Ag/For/Fish	Farm/For/Fish	Farm/For/Fish
Kansas	Motor vehicle	Ag/For/Fish	Mining	Farm/For/Fish	Transport
Kentucky	Motor vehicle	Ag/For/Fish	Mining	Crafts	Farm/For/Fish
Louisiana	Motor vehicle	TCPU	Mining	Crafts	Transport
Maine	Motor vehicle	Manufacturing	Ag/For/Fish	Farm/For/Fish	Farm/For/Fish
Maryland	Motor vehicle	TCPU	Mining	Crafts	Farm/For/Fish
Massachusetts	Falls	Construction	Ag/For/Fish	Crafts	Farm/For/Fish
Michigan	Homicide	Manufacturing	Ag/For/Fish	Crafts	Farm/For/Fish
Minnesota	Motor vehicle	Ag/For/Fish	Mining	Farm/For/Fish	Farm/For/Fish
Mississippi	Motor vehicle	Manufacturing	TCPU	Transport	Farm/For/Fish
Missouri	Motor vehicle	Ag/For/Fish	Mining	Transport	Farm/For/Fish
Montana	Machine	TCPU	Mining	Farm/For/Fish	Transport
Nebraska	Motor vehicle	Ag/For/Fish	Mining	Farm/For/Fish	Farm/For/Fish
Nevada	Motor vehicle	Construction	Mining	Crafts	Transport
New Hampshire	Motor vehicle	Construction	Construction	Crafts	Farm/For/Fish
New Jersey	Motor vehicle	Construction	Ag/For/Fish	Crafts	Farm/For/Fish
New Mexico	Motor vehicle	Construction	Mining	Transport	Transport
New York	Homicide	Retail trade	Mining	Transport	Laborers
North Carolina	Motor vehicle	Manufacturing	Ag/For/Fish	Crafts	Farm/For/Fish
North Dakota	Machine	Ag/For/Fish	Mining	Farm/For/Fish	Transport
Ohio	Motor vehicle	Manufacturing	Mining	Crafts	Farm/For/Fish
Oklahoma	Motor vehicle	Construction	Mining	Crafts	Transport
Oregon	Motor vehicle	Manufacturing	Mining	Farm/For/Fish	Farm/For/Fish
Pennsylvania	Motor vehicle	Construction	Mining	Transport	Transport
Rhode Island	Falls	Construction	Ag/For/Fish	Crafts	Farm/For/Fish
South Carolina	Motor vehicle	Construction	Construction	Crafts	Farm/For/Fish
South Dakota	Motor vehicle	Ag/For/Fish	Ag/For/Fish	Farm/For/Fish	Farm/For/Fish
Tennessee	Machine	Construction	Mining	Crafts	Farm/For/Fish
Texas	Motor vehicle	Construction	Mining	Crafts	Transport
Utah	Motor vehicle	Construction	Mining	Crafts	Transport
Vermont	Motor vehicle	Manufacturing	TCPU	Transport	Transport
Virginia	Motor vehicle	Construction	Mining	Crafts	Farm/For/Fish
Washington	Motor vehicle	Manufacturing	Mining	Farm/For/Fish	Farm/For/Fish
West Virginia	Motor vehicle	Mining	Mining	Crafts	Farm/For/Fish
Wisconsin	Machine	Ag/For/Fish	Mining	Farm/For/Fish	Farm/For/Fish
Wyoming	Motor vehicle	Construction	Construction	Crafts	Tech/Support§§

*The category of motor-vehicle–related deaths includes crashes occurring on and off the roadway, pedestrians struck by motor vehicles, noncollision incidents (e.g., falls from buses or cars), incidents involving off-road motor vehicles (e.g., snowmobiles or all-terrain vehicles), and incidents involving other road vehicles (e.g., bicycles).

†Precision production/Crafts/Repairers.

§Transportation/Material movers.

¶Agriculture/Forestry/Fishing.

**Farmers/Foresters/Fishers.

††Transportation/Communication/Public utilities.

§§Technicians and related technical support occupations.

Fatal Occupational Injuries — Continued

Mining was the highest risk industry in 26 states; agriculture/forestry/fishing, in 19 states; construction, in three states and the District of Columbia; and transportation/communication/public utilities, in two states.

The largest numbers of deaths, by occupation, were among precision production/crafts/repairers in 29 states; farmers/foresters/fishers in 14 states; transportation/material movers in eight states; and service workers in the District of Columbia. Occupation categories with the highest rates were farmers/foresters/fishers in 28 states; transportation/material movers in 20 states; handlers/equipment cleaners/helpers/laborers in one state and the District of Columbia; and technicians and related technical support occupations in one state.

Reported by: Div of Safety Research, National Institute for Occupational Safety and Health, CDC.

Editorial Note: The findings in this report indicate a general decrease in occupational injury deaths in the United States during 1980–1994. The decreases include the total numbers and average crude rates of deaths over the years and the average number of work-related deaths per year from the 1980s (6359) through 1994 (5267). In addition, the leading causes of death have changed through the 1990s. Although surveillance data cannot identify the reasons for these changes over time, there have been many changes in the workplace that may have contributed to these changes (e.g., increased regulations and hazard awareness and new technology and mechanization) as well as changes in the economy, the industrial mix, and the distribution of the workforce (*3*).

The findings of this analysis are subject to at least two limitations. First, only 67%–90% of all fatal occupational injuries can be identified through death certificates (*1*). Second, classification of "on-the-job" differs among medical examiners and coroners (*6*). Because of these limitations, the numbers presented in this report should be considered as minimum values.

The NTOF surveillance system, the most comprehensive source of surveillance data for fatal work-related injuries during 1980–1991, allows examination of trends over time and analysis of data within states, useful tools for identifying injury patterns and suggesting targets for preventive interventions. To address the limitations of death certificates and other existing data sources in the surveillance of fatal occupational injuries, in 1992 the BLS began collecting national work-related death data through the Census of Fatal Occupational Injuries (CFOI). CFOI is a multi-source surveillance system that typically requires at least two source documents[§] to verify work-relatedness (*7–10*). Although CFOI and NTOF identified similar patterns for industry and occupation in 1994, NTOF captured 5406 civilian deaths and CFOI captured 6528 (*10*). Another difference between the two surveillance systems is that the coding systems used to specify cause of death differ: NTOF uses E-codes from the *International Classification of Diseases, Ninth Revision* (*1*); CFOI uses the BLS-designed Occupational Injury and Illness Classification System (*7–10*). Direct comparisons of the two systems are complicated, but broad results on cause of death appear to be similar.

The data presented in this report provide the basis for strategies to prevent traumatic work-related injury deaths by taking into account high-risk industries and occupations and the varying patterns of fatal injuries identified in these data. In particular, state health departments and others involved in prevention of occupational injuries can use the state-specific data to identify high-priority areas for intervention. Addi-

[§]CFOI source documents include death certificates, Workers' Compensation records, and reports to federal and state agencies.

Fatal Occupational Injuries — Continued

tional state-specific data and information about NTOF are available from NIOSH; telephone (800) 356-4674 or (513) 533-8328.

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Surveillance for Nonfatal Occupational Injuries Treated in Hospital Emergency Departments — United States, 1996

CDC's National Institute for Occupational Safety and Health (NIOSH) uses the National Electronic Injury Surveillance System (NEISS) for surveillance of nonfatal occupational injuries treated in hospital emergency departments (EDs).* This report, based on 1996 NEISS data, is the first since 1983 (*1*) to provide updated national estimates of the magnitude and risk for nonfatal occupational injuries treated in EDs; the findings indicate that the workers at highest risk are young and male.

The Consumer Product Safety Commission (CPSC) developed NEISS to monitor injuries involving consumer products and to serve as a source for follow-up investigation of selected product-related injuries (*2*). Data are collected at 91 hospitals selected from a stratified probability sample of all hospitals in the United States and its territories. The sampling frame was stratified by hospital size (determined by the annual total of ED visits) and geographic region, and the final sample of 91 hospitals was then selected. NIOSH used 65 of the 91 hospitals to collect work-related injury data.† Each injury case in the sample was assigned a statistical weight based on the inverse of the hospital's probability of selection, and this weight was used to calculate national esti-

*The National Electronic Injury Surveillance System (NEISS), which is maintained by the Consumer Product Safety Commission (CPSC), was first modified to collect data about work-related injuries in 1981 and was used for surveillance of work-related injuries treated in EDs until this use was discontinued in 1986. Since 1992, the NEISS program has been gradually reinstated. Beginning in October 1995, data were collected for all workers, regardless of age or industry, in 65 of the 91 hospitals that CPSC includes in the NEISS surveillance program.

†Collection of work-related data was limited to the 65 hospital subsample because of budgetary constraints.