

Workplace-Related Homicide Among Health Care Workers in the United States, 1980 Through 1990

Richard A. Goodman, MD, MPH; E. Lynn Jenkins, MA; James A. Mercy, PhD

Objective.—To improve understanding of the epidemiology of fatal violence directed toward physicians and other health care workers (HCWs) in health care settings.

Design.—Analyses of data for 1980 through 1990 from the National Traumatic Occupational Fatalities surveillance system.

Main Outcome Measures.—Overall occurrence of occupational injury deaths and occurrence of workplace-related homicides among HCWs.

Results.—From 1980 through 1990, a total of 522 HCWs died from injuries sustained while working. The most common causes of death were motor vehicle crashes (122 [23.4%]), homicide (106 [20.3%]), and suicide (88 [16.9%]). Firearms were used in the greatest number (78 [73.6%]) of workplace-related homicides among HCWs.

Conclusions.—These findings highlight the need for strengthened surveillance and more accurate estimates of the risks of workplace-related violent injury for HCWs in the United States.

(*JAMA*. 1994;272:1686-1688)

REPORTS of violent attacks directed toward health care workers (HCWs) from 1992 to 1994 have dispelled illusions about the invulnerability of physicians, nurses, and other health professionals to violence in the workplace.¹⁻⁷ These reports have underscored both the reality of such risks and the urgent need to identify approaches for preventing workplace-related violent injury in HCWs.

Although homicide is the third leading cause of injury death in the work-

place in the United States⁸ and has been noted to be among the leading causes of occupational injury death for some groups of HCWs,⁹ the epidemiology of homicide among HCWs has not been well characterized. To improve understanding of the epidemiology of fatal violence in health care settings and to assist in the development of prevention strategies, we used a national database to examine work-related homicides among HCWs in the United States. In this article, we summarize the overall occurrence of occupational injury deaths and workplace-related homicides among HCWs in the United States from 1980 through 1990.

Methods

Data on occupational injury deaths among HCWs for 1980 through 1990 were obtained from the National Trau-

matic Occupational Fatalities surveillance system.^{10,11} This surveillance system is a death certificate-based census of all occupational injury deaths in the United States (details regarding the methods and limitations of this system have been described previously^{8,12}). These data are compiled by the National Institute for Occupational Safety and Health (NIOSH) of the Centers for Disease Control and Prevention (CDC) from death certificates collected from the 50 states, New York City, and the District of Columbia for workers aged 16 years or older who died from an external cause of injury or poisoning and for whom the certifier noted a positive response to the item "injury at work?" Homicides were identified using *International Classification of Diseases, Ninth Revision*, codes E960 through E969 (homicide and injury purposefully inflicted by others).

Denominator data for the calculation of fatality rates were taken from the Current Population Survey, a monthly survey of approximately 60 000 households nationwide; estimates for civilian workers are published annually.¹³ Because the scheme for coding occupations was changed in 1983, occupation-specific rates were calculated only for 1983 through 1990. Because of the instability of rates based on small numbers, rates were not calculated for subgroups with fewer than three deaths.

Results

From 1980 through 1990, a total of 67 679 civilian workers died from injuries sustained while working. Of these,

From the Epidemiology Program Office (Dr Goodman), Division of Safety Research, National Institute for Occupational Safety and Health (Ms Jenkins), and Division of Violence Prevention, National Center for Injury Prevention and Control (Dr Mercy), Centers for Disease Control and Prevention, Atlanta, Ga.

Reprint requests to Epidemiology Program Office MS-C08, Centers for Disease Control and Prevention, Atlanta, GA 30333 (Dr Goodman).

Table 1.—Number of Deaths in Health Care Workers in the United States, by Occupational Category and External Cause of Injury, 1980 Through 1990

Occupational Category	External Cause of Injury				Total
	Motor Vehicle	Homicide	Suicide	Other	
Pharmacist	4	27	7	4	42
Physician	13	26	39	50	128
Registered nurse	35	18	9	55	117
Nurse's aide	22	17	6	23	68
Other	48	18	27	74	167
Total	122	106	88	206	522

Table 2.—Workplace-Related Homicides in Health Care Workers in the United States, by Occupational Category, Sex, and Weapon/Method Used in Homicide, 1980 Through 1990

Occupational Category	Sex		Weapon/Method Used in Homicide		
	M	F	Firearm	Cutting Instrument	Other
Pharmacist	24	3	24	2	1
Physician	23	3	19	3	4
Registered nurse	3	15	13	4	1
Nurse's aide	2	15	9	4	4
Other*	12	6	13	2	3
Total	64	42	78	15	13

*This category includes health aides except nurses (4), dentists (2), health technicians not classified elsewhere (2), optometrists (2), physical therapists (2), radiologic technicians (2), clinical laboratory technicians (1), health records technicians (1), licensed practical nurses (1), and physician assistants (1).

Table 3.—Number and Rate of Workplace-Related Homicides Among Health Care Workers in the United States, by Occupational Category and Sex, 1983 Through 1990*

Occupational Category	Male, No. (Rate)	Female, No. (Rate)	Total, No. (Rate)
Pharmacist	14 (1.54)	2 (. . .)	16 (1.21)
Physician	12 (0.35)	3 (0.40)	15 (0.36)
Registered nurse	1 (. . .)	13 (0.11)	14 (0.12)
Nurse's aide	1 (. . .)	10 (0.10)	11 (0.10)
Other health care worker	9 (0.19)	4 (0.03)	13 (0.07)
Total	37 (0.34)	32 (0.09)	69 (0.15)

*Rate per 100 000 workers. Ellipses indicate rate not calculated because fewer than three cases.

522 deaths occurred among HCWs, including 128 physicians; 117 registered nurses; 68 nurse's aides, orderlies, and attendants; 42 pharmacists; and 167 HCWs in other occupational categories. The three most common causes of injury death among HCWs were motor vehicle crashes (122 [23.4%]), homicide (106 [20.3%]), and suicide (88 [16.9%]) (Table 1).

For 1980 through 1990, the National Traumatic Occupational Fatalities system contains records for a total of 106 workplace-related homicides among civilian HCWs in the United States. The greatest number of homicides were among pharmacists (27), physicians (26), registered nurses (18), and nurse's aides (17); 18 homicides occurred among HCWs in other groups (Table 2). Nearly two thirds of homicides (64 [60.3%]) occurred among men. Firearms were used in the greatest number (78 [73.6%]) of workplace-related homicides among HCWs. The average annual work-related homicide rate for HCWs during

the 8-year period of 1983 through 1990 was 0.15 per 100 000 HCWs; in comparison, during 1980 through 1989, the average annual work-related homicide rate for all occupations in the United States was 0.71 per 100 000 workers.¹⁰ Occupation- and gender-specific fatality rates for HCWs ranged from 1.54 per 100 000 male pharmacists to 0.10 per 100 000 female nurse's aides (Table 3).

Comment

Workplace-related risks for violence and violent injury among HCWs in the United States were reported at least as early as the end of the 19th century.¹⁴ More recent reports have underscored a growing recognition of workplace-related violence as a problem for nurses and in specific settings, particularly emergency departments and psychiatric facilities.¹⁵⁻¹⁹

The findings of this descriptive study further quantify and refine our understanding of fatal workplace-related violent injury for HCWs and may be most

useful in suggesting hypotheses regarding risk factors for this problem. For example, the risk for workplace-related homicide was greatest among male pharmacists, possibly reflecting their proximity both to cash during robberies and to controlled substances in demand by substance abusers or those seeking to profit from the illegal sale of such substances. In addition, the gender-specific homicide rate among male HCWs was more than threefold greater than that among female HCWs—a pattern similar to that for workers in all industries during 1980 through 1989.⁸ However, because of the instability of the calculated rates for HCWs, continuing surveillance of workplace-related homicide, as well as assessment of the epidemiology of nonfatal assaults, will be important in clarifying variations in risk by occupational category.

The findings of this study underscore that firearms contribute substantially to homicide among HCWs and other workers in the United States. Firearms accounted for 74% of the homicides among HCWs during 1980 through 1990 and for 75% of workers killed in the workplace in the United States during 1980 through 1989.¹² In comparison, among all homicide victims in the United States during 1983 through 1989, gunshot wounds were the cause of death for 61%.²⁰ The frequent use of firearms in homicides among HCWs indicates that efforts must be directed toward the protection of HCWs from injury by firearms in the work setting.

Because of the inherent nature of death certificate-based surveillance, the findings of this report are subject to at least four potential limitations. First, this data source provides no information about what, if any, prior relationship may have existed between the victim and assailant; for example, some deaths may have resulted from domestic disputes that were unrelated to the workplace but carried over into this setting. Second, the specific location and circumstances of a homicide are not recorded on the death certificate; as a consequence, for example, this study could not differentiate homicides among pharmacists in retail pharmacies from those in the hospital setting. Third, because the database restricted the focus of the investigation to deaths, this analysis could not assess the risk of homicide in relation to nonfatal violent injury for HCWs. Finally, for the period studied, no standardized definition of an injury at work was used by medical examiners and coroners; consequently, because the response to this item on the death certificate was subject to interpretation by individual certifiers, the total number of

workplace-related homicides among HCWs may have been undercounted. To address this need, NIOSH and other CDC programs have collaborated with the Association for Vital Records and Health Statistics to develop and distribute operational guidelines for the determination of work-related fatalities.⁸

Despite the absence of reliable estimates of the risk for nonfatal and fatal violent injury for most health care settings, professional and governmental organizations are recognizing the need to protect HCWs from violence in the workplace. For example, guidelines developed for workers in emergency departments have addressed the needs to

identify and manage the violent or potentially violent patient and visitor, assess and improve security measures, and understand relevant legal considerations (eg, the right to a safe workplace, the right to treatment, and the duty to third parties).²¹ In California, recommendations recently developed to protect the safety of health care workers and community service workers outlined both general considerations (eg, the commitment of management and the need for evaluation) and elements of a program for safety in specific work settings (eg, engineering controls and personal protective measures).²² Measures such as these should be adopted as appropriate.

These efforts will be abetted as effective prevention strategies are identified through strengthened surveillance for workplace-related violent injury for HCWs in the United States and refined estimates of the risks for such problems, improved understanding of the circumstances under which homicides occur, and rigorous evaluation of proposed and alternative preventive measures.

This article is dedicated to the prevention of workplace-related violence among health care workers and to the memory of John L. Kemink, MD, who was murdered in June 1992 while providing patient care in Ann Arbor, Mich.

We are grateful to R. Gibson Parrish, MD, Susan Good, RN, and Suzanne Kisner for their assistance with this study.

References

1. Scott K. Health care professionals placing their lives on the line every day. *US Med.* 1993;29:2, 12.
2. Mastrangelo R. On the front line: health care providers: targets of violence. *Advance.* 1994;2:16.
3. Mitchell J, Hubler S. Patient at County-USC shoots 3 doctors, gives up in standoff violence: one victim is reported near death and two are listed as critical. *Los Angeles Times.* February 9, 1993:A1.
4. Stewart L, Niemiec D, Pollak L. Revered doctor slain at his work: dissatisfied patient pulls a gun and a 42-year-old physician dies. *Detroit Free Press.* June 26, 1992:1A.
5. Silverman D, Kiernan L. Neo-Nazi motive in Wilmette doctor's killing. *Chicago Tribune.* August 10, 1993:section 1:1, 10.
6. Klimko F, Duerksen S. Doctor shot while treating patient: National City man in for exam is sought by police. *San Diego Union Tribune.* February 19, 1994:B1:1, 6, 7.
7. Associated Press. Five are killed, 19 injured in shooting at air base: gunman slain after attack at hospital, authorities say. *Atlanta Constitution.* July 21, 1994:A1.
8. Jenkins EL, Kisner SM, Fosbroke DE, et al. *Fatal Injuries to Workers in the United States, 1980-1989: A Decade of Surveillance.* Washington, DC: US Government Printing Office; 1993. DHHS (NIOSH) 93-108.
9. Stout NA. Occupational injuries and fatalities among health care workers in the United States. *Scand J Work Environ Health.* 1992;18(suppl 2): 88-89.
10. Bell CA, Stout NA, Bender TR, Conroy CS, Crouse WE, Myers JR. Fatal occupational injuries in the United States, 1980 through 1985. *JAMA.* 1990;263:3047-3050.
11. Jenkins EL, Layne LA, Kisner SM. Homicide in the workplace: the US experience, 1980-1988. *J Am Assoc Occup Health Nurses.* 1992;40:215-218.
12. Castillo DN, Jenkins EL. Industries and occupations at high risk for work-related homicide. *J Occup Med.* 1994;36:125-132.
13. US Dept of Labor. *Employment and Earnings.* Washington, DC: US Dept of Labor; 1984-1990. Issue No. 1 for each year.
14. Assaults upon medical men. *JAMA.* 1892;18: 399-400.
15. Lipscomb JA, Love CC. Violence toward health care workers. *J Am Assoc Occup Health Nurses.* 1992;40:219-228.
16. Keep N, Gilbert P. California Emergency Nurses Association's informal survey violence in California emergency departments. *J Emerg Nurs.* 1992;18: 433-442.
17. Lavoie FW, Carter GL, Danzi DF, Berg RL. Emergency department violence in United States teaching hospitals. *Ann Emerg Med.* 1988;17:1227-1233.
18. Goetz RR, Bloom JD, Cheneli SL, Moorhead JC. Weapons possession by patients in a university emergency department. *Ann Emerg Med.* 1991;20: 8-10.
19. Carmel C, Hunter M. Staff injuries from inpatient violence. *Hosp Community Psychiatry.* 1989; 40:41-46.
20. National Center for Injury Prevention and Control. *Injury Mortality: National Summary of Injury Mortality Data, 1983-1989.* Atlanta, Ga: Centers for Disease Control and Prevention, US Public Health Service; 1992.
21. American College of Emergency Physicians. *Emergency Department Violence: Prevention and Management.* Dallas, Tex: American College of Emergency Physicians; 1988.
22. State of California. *Guidelines for Security and Safety of Health Care and Community Service Workers.* San Francisco, Calif: Division of Occupational Safety and Health, Dept of Industrial Relations; 1993.