Homicide in the Workplace

THE U.S. EXPERIENCE, 1980-1988

by E. Lynn Jenkins, MA, Larry A. Layne, MA, and Suzanne M. Kisner, BS

Homicide was the third leading cause of occupational injury death in the United States from 1980 to 1988. Twelve percent of all occupational injury deaths in the period were homicides. Only motor vehicle (23%) and machine related (13%) incidents accounted for more deaths.

State specific studies in North Carolina (Sniezek, 1989) and Texas (CDC, 1985) yielded similar results, with homicide accounting for 12% and 14% of the occupational injury deaths in those states, respectively. The initial Texas study included only males. A subsequent analysis of data for females yielded dramatically different results, with homicide accounting for 53% of all occupational injury deaths of Texas females (Davis, 1987a). An analysis of National Traumatic Occupational Fatality (NTOF) data for the United States from 1980 to 1985 indicated that 41% of all females who died as a result of workplace trauma were homicide victims (Bell, 1991).

ABOUT THE AUTHORS:

Ms. Jenkins is Acting Chief, and Mr. Layne and Ms. Kisner are Statisticians, Injury Surveillance Section, Surveillance and Field Investigations Branch, Division of Safety Research, NIOSH, Morgantown, WV.

METHODS

The NTOF surveillance system collects death certificates from the 50 states, New York City, and the District of Columbia for all deaths to persons 16 years or older for whom an external cause of death was reported according to the International Classification of Diseases, Ninth Revision (ICD-9) (WHO, 1977), and for whom the certifier noted a positive response to the "Injury at Work?" item. Bell (1990) provided a complete discussion of the methods and limitations of the NTOF system.

The ICD-9, an international coding scheme used to characterize the nature and causes of death, includes a supplementary chapter for the classification of external causes of injury and poisoning. The codes from this chapter, denoted with a preceding "E," cover the spectrum of unintentional and intentional external causes of death. Cases were defined for this analysis using the ICD-9 codes E960 through E969. This covers the rubric titled, "Homicide and Injury Purposely Inflicted by Other Persons," which is defined as "injuries inflicted by another person with intent to injure or kill, by any means." Because the data are taken from death certificates, only fatalities are included.

From 1980 through 1984, data on work related homicides were not available for Louisiana, Nebraska, New York, and Oklahoma. In subse-

TABLE 1

Occupational Homicides, U.S. 1980-1988: Rate per 100,000 Workers by Age and Gender

	Gender	
Age Group (years)	*Males*	*Females*
16-19	.56	.23
20-24	.92	.34
25-34	.91	.37
35-44	1.03	.29
45-54	1.09	.30
55-64	1.29	.35
65+	2.79	.88

quent years, data were obtained for these states as procedures were altered to allow the retrieval of this information.

Employment information was coded from the usual industry and occupation narratives from the death certificate. Occupation narratives were coded according to the Bureau of the Census classification scheme (U.S. Dept. of Commerce, 1982), and industry narratives were coded according to the Standard Industrial Classification Manual, 1987 (Office of Management and Budget, 1987).

Denominator data for the calculation of rates by occupation, age, and gender were taken from *Employment and Earnings* annual averages (U.S. Dept. of Labor, 1981-1989), and for industry divisions and geographic region from the Bureau of the Census County Business Patterns (U.S. Dept. of Commerce, 1980-1988). Denominator data were not adjusted to exclude employment data from those states for which fatality data were not available for portions of the study.

RESULTS

The researchers identified 6,956 cases of work related homicides in the United States from 1980 to 1988. Eighty percent of the victims were males. The age and gender specific rates are depicted in Table 1. Of all occupational injury deaths to females from 1980 to 1988, 40% were homicides. The age of the victims ranged from 16, the youngest reported by the NTOF system, to 93 years. The age group with the highest rate of occupational homicide was the 65 years and older group (2.04 per 100,000 workers).

TABLE 2

Occupational Homicide, U.S. 1980-1988: Number and Rate per 100,000 Workers by Occupation

Occupation	*Number*	*Rate*
Laborers	641	1.56
Transport Operatives	619	1.53
Sales	1529	1.38
Service	1268	1.00
Executive/Administrator/ Manager	972	.92
Farmers	157	.49
Crafts	490	.42
Professional/Specialty	321	.27
Machine Operators	145	.20
Clerical	289	.19
Technical/Support	33	.12
Unknown	492	—

Occupation

The occupational group with the highest number of work related homicides was sales workers, accounting for 22% of the cases in this analysis. Persons employed in service occupations accounted for another 18%, with executives/administrators/ managers accounting for 14%. Rates per 100,000 workers were highest for laborers (1.56), transport operatives (1.53), and sales workers (1.38) (Table 2).

Industry

The industrial division with the highest number of work related homicide deaths was retail trade, with 36% of the victims falling into this category. The services industry accounted for 17% of the deaths and public administration another 11%. Rates, expressed per 100,000 workers, were highest among workers employed in retail trade and public administration, both with rates of 1.70. Law enforcement personnel are included in public administration. The industry division transportation/ communication/public utilities had a rate of 1.50 (Table 3).

Hour of Occurrence

Information on the hour of injury was missing on 30% of the cases identified for this study. For the remaining 70%, the hour of occurrence with the

greatest frequency of work related homicide was midnight to 12:59 a.m. This time period was followed by 10 p.m. to 10:59 p.m. and 11 p.m. to 11:59 p.m. The 3 hour period from 10 p.m. to 12:59 a.m. accounted for 20% of all occupational homicide events for which the time of occurrence was known.

Method of Homicide

Firearms accounted for 75% of the deaths; cutting and piercing instruments accounted for another 14%. Females were six times as likely as males to have died as a result of strangulation. Additionally, females were more likely to have died of wounds inflicted by cutting or piercing instruments.

Region of the United States

A majority (49%) of the deaths occurred in the Southern region of the United States. The West accounted for 24%, with the North Central and North East regions accounting for 19% and 8%, respectively. The rate per 100,000 workers was 1.42 in the Southern region. In the West, the rate was 1.12 per 100,000 workers.

TABLE 3

Occupational Homicides, U.S. 1980-1988: Number and Rate per 100,000 Workers by Industry Division

Industry Division	*Number*	*Rate*
Retail Trade	2518	1.70
Public Administration	778	1.70
Transport/Communication/ Public Utilities	647	1.50
Construction	274	.69
Services	1176	.63
Agriculture/Forestry/Fishing	207	.58
Mining	42	.50
Finance/Insurance/Real Estate	206	.39
Manufacturing	469	.27
Wholesale Trade	100	.20
Not Classified	539	—

DISCUSSION

While homicide has always been of concern to public health professionals, work related homicide only recently has been recognized as an area in need of research and prevention efforts. At least 750 people are killed as a result of occupational homicide each year. The problem affects workers of all ages, but those 65 years and older appear to be at the highest risk. It is unclear whether these persons are perceived as "softer" targets, are less likely to survive their injuries, or are employed in environments significantly different from workers of other ages.

Higher rates of occupational homicide among sales workers and in the retail and services industries may be explained by theories developed in other studies which indicate that exposure to the public and the exchange of money increase the risk of occupational homicide (Davis, 1987a, 1987b; Hales, 1988; Kraus, 1987).

The high rate of occupational homicide to laborers and transport operatives as well as to workers in public administration and transportation/communication/public utilities industries will require other explanations. Transport workers may be carrying cash which exposes them to the risk of robbery/homicide, but the extent to which this may be the case is unknown. More detailed epidemiologic studies of workplace assaults and homicides are required to illuminate the circumstances of these events.

More complete information on the hour of occurrence is needed to assess the importance of the time of day in these events. Improved data would help differentiate between events that occur within the workplace from those associated with leaving or arriving at the workplace; for example, shift changes. Additionally, data on the number of worker hours of exposure by time of day are necessary to adequately describe the magnitude of the risk. Analysis of hour of injury information by industrial division also may reveal differences relevant to prevention.

Clearly, firearms pose the greatest danger of workplace homicide. The fact that females are more likely to die of "close contact" wounds, such as strangulation and cutting/piercing wounds, requires additional investigation to ascertain effective prevention measures.

The analysis by geographic region is hampered by the fact that data were not available from four states for at least the first 5 years of the study, and were not available from New York or Louisiana until 1987. The heavy concentration of occupational homicides in the South and West merits further study.

A number of behavioral and environmental strategies have been proposed to reduce the risk and incidence of occupational homicide (CDC, 1986; Crow, 1975; Erickson, 1980; Felson, 1983). Rigorous evaluation of strategies alone and in combination should be performed to target appro-

Homicide in the Workplace
The U.S. Experience, 1980-1988.

Jenkins, E.L., Layne, L.A., & Kisner, S.M.

AAOHN Journal 1992; 40(5):215-218.

1. Homicide was the third leading cause of occupational injury death in the United States from 1980 to 1988.

2. Of all occupational injury deaths to females from 1980 to 1988, 40% were homicides.

3. The highest age specific rates of occupational homicide were found among workers 65 years and older (2.04 per 100,000 workers).

4. Protection of workers will require the collaborative work of public health and safety professionals, including occupational health nurses, as well as law enforcement, engineering, and architecture professionals and behavioral scientists.

priate physical redesign of "at risk" workplaces, as well as changes in work practices to protect workers from this public health problem.

The protection of workers will require the collaborative work of public health and safety professionals, including occupational health nurses, and law enforcement, engineering, and architecture professionals and behavioral scientists. These professionals are critical to the collection of improved data and to the design, implementation, and evaluation of intervention strategies. A multidisciplinary approach is essential to the success of occupational homicide prevention efforts.

Acknowledgement: The authors acknowledge the assistance of Patricia Cutlip, Rosemary Cianfrocco, and Rebecca Cruise.

REFERENCES

Bell, C.A., Stout, N.A., Bender, T.R., Conroy, C.S., Crouse, W.E., & Myers, J.R. (1990). Fatal occupational injuries in the United States, 1980 through 1985. *JAMA, 263,* 3047-3050.

Bell, C.A. (1991). Female homicides in U.S. workplaces, 1980-1985. *American Journal of Public Health, 81,* 729-732.

Centers for Disease Control. (CDC). (1985). Fatal occupational injuries—Texas, 1982. *Morbidity and Mortality Weekly Report, 34,* 130-139.

Centers for Disease Control. (CDC). (1986). *Homicide Surveillance; High Risk Racial and Ethnic Groups: Blacks and Hispanics, 1970-1983.* Atlanta, GA: CDC.

Crow, W., & Bull, J.L. (1975). *Robbery Deterrence: An Applied Behavioral Science Demonstration.* La Jolla, CA: Western Behavioral Sciences Institute.

Davis, H., Honchar, P.A., & Suarez, L. (1987a). Fatal occupational injuries of women, Texas 1975-1984. *American Journal of Public Health, 77,* 1524-1527.

Davis H. (1987b). Workplace homicides of Texas males. *American Journal of Public Health, 77,* 1290-1293.

Erickson, R., & Crow, W. (1980). Violence in business settings. *American Behavioral Scientist, 23,* 717-743.

Felson, R.B., & Steadman, H.J. (1983). Situational factors in disputes leading to criminal violence. *Criminology, 21,* 59-74.

Hales, T., Seligman, P.D., Newman, S.C., & Timbrook, C.L. (1988). Occupational injuries due to violence. *Journal of Occupational Medicine, 30,* 483-487.

Kraus, J.F. (1987). Homicide while at work: Persons, industries, and occupations at high risk. *American Journal of Public Health, 77,* 1285-1289.

Office of Management and Budget. (1987). *Standard Industrial Classification Manual, 1987.* Washington, D.C.:author.

Sniezek, J.E., & Horiagon, T.M. (1989). Medical-examiner-reported fatal occupational injuries, North Carolina, 1978-1984. *American Journal of Industrial Medicine, 15,* 669-978.

U.S. Department of Labor. (1981-1989). *Annual Average Supplements: Employment and Earnings, 28-36* (issue no. 1 for each). Washington, D.C..

U.S. Department of Commerce, Bureau of the Census. (1980-1988). *County Business Patterns* (state files and public use data tapes). Washington, D.C.

U.S. Department of Commerce, Bureau of the Census. (1982). *1980 Census of Population: Alphabetic Index of Industries and Occupations.* Publication PHC80-R3.

World Health Organization. (WHO). (1977). *International Classification of Diseases: Manual on the International Statistical Classification of Diseases, Injuries, and Causes of Death,* Ninth Revision. Geneva, Switzerland.