Female Homicides in United States Workplaces, 1980–1985

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ABSTRACT

Background: Women, while noted for low occupational injury mortality rates, are more likely to die as victims of assault than from any other manner of injury at work.

Methods: From the National Traumatic Occupational Fatality surveillance data, 950 women were identified who were fatally assaulted at work. Homicide rates were calculated for the demographic and employment characteristics of these women. Risk ratios among types of lethal injuries were examined.

Results: During 1980–1985, the crude six-year workplace homicide rate was 4.0 deaths per million working women: one twentieth the homicide rate of the US female population. Decedents ranged from 16 years (the lowest age included in the data base) to 93 years of age. Working women older than 65 years had the highest age-specific homicide rate, 11.3 per million. Women younger than 20 had the lowest, 2.5 per million per year. Homicide rates for women of races other than White were nearly twice as high as those of Whites.

The leading causes of death were gunshot wounds (64 percent), stabbings (19 percent), asphyxiations (7 percent), and blunt force trauma (6 percent). Nearly 43 percent of the deceased women had been employed in retail trade: 8.7 per million employed women annually.

Conclusions: During 1980–1985, only 6 percent of the nation's victims of work-related injury deaths were female: 41 percent of those women were murdered. Homicide is currently the leading manner of traumatic workplace death among women in the United States. (*Am J* Public Health. 1991; 81:729–732)

Introduction

Injury surveillance conducted by the National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research, has shown that from 1980 through 1985, homicide was the third leading manner of workplace death in the United States, surpassed only by motor vehicle crashes and machine-related fatal injuries. Nearly 13 percent of all occupational injury deaths were homicides. During 1980–85, 47 percent of the United States work force was female,[1] yet only 6 percent of the nearly 7,000 annual fatal work-related injuries were suffered by women: 41 percent of these women were homicide victims.[2]

Two state-based studies have shown that homicide is a prominent form of lethal occupational injury among women. In a study of fatal work-related injuries in Texas, 1975–80, 53 percent of the 348 women were murdered.[5] Only 13 percent of the fatally injured men were homicide victims.[6] The occupational homicide rate for women was one-third that for men: 7 per million employed women per year compared to 21 per million employed men. In California during 1979–81, the rate of work-related homicide among employed women was 5 per million compared to 22 per million among men.[7] Both studies showed that while a woman was at lower risk of being murdered at work than a man, a greater proportion of female traumatic occupational deaths were due to homicide.

Recently, NIOSH began using demographic and injury event information from state death certificates to examine US fatal occupation injuries, including homicides. This report describes the female victims of work-related homicide during 1980–85, as reported to the National Traumatic Occupational Fatality (NTOF) surveillance system.

Methods

The NTOF data base is composed of death certificates from all state vital statistics reporting units in the US that meet the following criteria: 1) age at death—16 years or older; 2) a positive response to the "Injury at Work" item; and 3) an external cause of death (International Classification of Diseases, Ninth Revision, E800-E999). The methods and limitations that pertain to NTOF injury surveillance are described fully elsewhere.[8]

All NTOF records of female deaths from 1980 through 1985 that reported homicide as the manner of death were selected for this analysis. Homicide, death due to injuries purposely inflicted by another person, was identified using the element in Part II of the death certificate that queries "Accident, Suicide, Homicide, or Pending" because not all NTOF records had coded cause of death information at the beginning of the study. No effort was made to exclude deaths due to legal intervention. Recording practices in Louisiana, Nebraska, New York, and Oklahoma prevented identification of work-related

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TABLE 1—Female Occupational Homicides in the United States[a] by Year, 1980–85: Numbers and Annual Rates[b]

Year	Number	Deaths per 1,000,000
1980	176	4.75
1981	163	4.36
1982	171	4.44
1983	143	3.65
1984	147	3.59
1985	150	3.57
All Years	950	4.04

[a]Excluding deaths from Louisiana, Nebraska, New York, and Oklahoma.
[b]Deaths per 1,000,000 workers.

TABLE 2—Female Occupational Homicides in the United States[a] by Age, 1980–85: Numbers and Six-year Rates[b]

Age (years)	Number	Deaths per 1,000,000
16–19	43	2.50
20–24	155	4.47
25–34	286	4.34
35–44	159	3.17
45–54	138	3.81
55–64	101	4.11
65+	68	11.28

[a]Excluding deaths from Louisiana, Nebraska, New York, and Oklahoma.
[b]Deaths per 1,000,000 workers.

intentional injuries over the study period, so homicide data from these four states were not available.

Employment information was coded from the "usual" industry and occupation entries on the certificates. The Standard Industrial Classification[9] system was used to categorize usual industry of employment. Occupation information was coded into major groups with the 1970 Bureau of Census Classifications for deaths in 1980 through 1982 and the 1980 Bureau of Census Classifications for deaths in 1983 through 1985. The two coding schemes ensured agreement between incidence and underlying employment information because the source of the population data used in the rate calculations changed coding schemes in 1983.[10,11]

To calculate mortality rates, the Annual Summaries of EMPLOYMENT AND EARNINGS[12] provided denominator data for the US. The GEOGRAPHIC PROFILE OF EMPLOYMENT AND UNEMPLOYMENT[13] was used to correct the denominator data used in age-, race-, and employment-specific rates by excluding the estimated work force of the four states which did not provide homicide data to NTOF (nearly 10 percent of the female work force of the US).

Homicide frequencies and annual and six-year mortality rates were calculated for demographic and employment characteristics. Victims whose occupations or industries of employment were unclassifiable were not included in employment-specific rate calculations, although they were included in all other rates. Age- and race-specific rates were estimated. Race-specific rates were calculated for Whites (including Hispanics), Blacks, and Others (Asians and American Indians). Definitive employment data were not available for Hispanics, Asians, or American Indians. Risk ratios (RR) contrasting types of injury (e.g. firearms versus not firearm) within racial subsets were estimated.

Deaths assumed to involve close physical contact, such as stabbing or beating, were compared to those resulting from gunshot wounds that could be inflicted from a distance. Two categories of close physical contact deaths were defined: multiple stabbing and a broader category that included all rape, stabbing, slashing, blunt force, and manual asphyxiation deaths. These were contrasted to the gunshot wounds through risk ratio estimates. Ninety-five percent Taylor Series confidence intervals were constructed around all risk ratio estimates.[14]

Results

NTOF data described 950 women who were murdered at work during 1980–85 (Table 1). The women's ages ranged from 16, the youngest documented in NTOF data, to 93 years. The six-year age-adjusted homicide rate was 4.5 deaths per million working women. The highest homicide rate, 11.3 per million, was among working women 65 years of age and older (Table 2).

Black women were 1.8 times more likely to be killed than Whites. The RR for homicide among Blacks contrasted to all other women was 1.7 (95% CI: 1.4, 2.0) and for the Other racial category was 1.9 (95 % CI: 1.4, 2.5). Hour of injury was reported for 680 cases: homicides were most frequent between 4:00 and 5:00 pm. However, 30 percent of the women were murdered between 6:00 pm and midnight and 69 percent died between 3:00 pm and 7:00 am.

Industry of Employment

Nearly 43 percent of the homicide victims were employed in the Retail Trade Industry which also had the highest six-year homicide rate, 8.7 per million retail employees. Forty-one percent of these women worked in food stores, and 34 percent in eating and drinking establishments.

The Transportation, Communication, and Public Utilities Industry had the second highest rate, 4.0 per million: 34 percent were employed in motor freight transportation and warehousing and 18 percent in local passenger transportation with buses and taxis. While 23 percent of the women worked in the Service Industry, their homicide rate was quite low, 2.22 per million: 22 percent of these women worked in education, 16 percent in health services, and 13 percent in hotels, motels, and other lodging.

In Public Administration, 33 percent of the women were employed in justice, public order, and safety, 28 percent in general government, and 23 percent in the military. Industry of employment was not coded for 14 percent of the decedents, due to lack of specific employment information on the death certificates (Table 3).

Occupation

Despite the changes in the occupation classification schemes in 1983, 71 percent of the murdered women were employed in only four occupational groups: sales personnel (n = 184), clericals (n = 169), service employees (n = 182), and supervisors (executives, managers, and administrators) (n = 151). During 1980-82, retail store clerks and cashiers, classified as clericals, accounted for 26 percent of the decedents' occupations: their homicide rate was only 3.4 per million. Sales workers, such as sales clerks and owners of retail establishments, died at a rate of 8.3 per million. During the next three years, retail clerks and cashiers were classified as sales occupations. These accounted for 27 percent of the 1983–85 deaths with a three-year rate of 7.6 per million.

For the six-year period, 105 of the 175 women in service occupations were employed in eating and drinking establishments. At least 52 of these worked in bars, taverns, or lounges. Nineteen women were employed as law enforcement officers or security guards. Lack of national

TABLE 3—Female Occupational Homicides in the United States[a] by Industry, 1980–85: Numbers and Six-year Rates[b]

Industry	Number	Deaths per 1,000,000
Agriculture/Forestry/Fishing	4	1.11
Construction	6	2.15
Manufacturing	44	1.23
Transportation/Communication/Public Utilities	38	3.97
Wholesale Trade	9	1.52
Retail Trade	405	8.66
Finance/Insurance/Real Estate	55	2.78
Services	219	2.20
Public Administration	40	3.92
Not Classified	130	—

[a]Excluding deaths from Louisiana, Nebraska, New York, and Oklahoma.
[b]Deaths per 1,000,000 workers.

estimates for employment in these specific occupations made rate calculations impossible.

Employment as a supervisor increased a woman's risk of homicide. Decedents most commonly managed restaurants, apartment complexes, or retail establishments. Ten percent of the women owned their own businesses.

Region

Only 24 (3 percent) of the women were murdered outside the states where they resided. Despite the lack of reporting from Louisiana and Oklahoma, over half (52 percent) of the murders took place in the South at a rate of 5.7 per million women working in the reporting states. The Western states had the second highest rate, 4.1 per million, and 23 percent of the homicides. The North Central states, where Nebraska deaths were not reported, had a homicide rate of 2.5 per million and 18 percent of the deaths. Only 7 percent of the fatalities were reported from the Northeast at a rate of 1.2 per million. This region's figures are seriously compromised by the omission of New York deaths from the data. Of the 46 states reporting, rates indicated that women were at highest risk of being murdered at work in Nevada, Mississippi, the District of Columbia, Florida, and Texas.

Method of Homicide

Firearm injuries caused 609 deaths (64 percent): 148 (16 percent) noted multiple gunshot wounds. Stabbing and slashing caused 181 deaths (19 percent). Multiple stabbing was mentioned in 103 cases (11 percent). Decedents were asphyxiated in 69 (7 percent) or died from blunt force injuries in 57 (6 percent) of the cases. Together, fires, explosions, motor vehicle impacts, poisoning, and sexual assault were reported in fewer than 4 percent of all cases.

Lethal gunshot wounds were most frequent in the 25–54 year age range. The firearm homicide rate among Black females averaged 4.4 per million compared to 2.2 per million among Whites. Black women were slightly more likely to die from gunshot than other wounds (RR, 1.1, 95% CI: 1.0, 1.2). The risk of Hispanic women dying from firearm relative to other injuries (RR) was 1.4 (95% CI: 1.2, 1.6).

Multiple stabbings were prominent, but not significantly elevated, among the oldest women. However, the risk of an elderly woman dying from any form of physical contact relative to gunshot wounds (RR) was 3.6 (95% CI: 2.6, 4.9). Asian and American Indian women were slightly more likely to be killed in trauma involving physical contact than from gunshot wounds (RR of 1.4, 95% CI: 1.0, 2.0), while Black women were more likely to die from gunshot wounds (RR = 0.7, 95% CI: 0.5, 0.9).

Discussion

While the limitations of death certificate information in general[15–18] and NTOF in particular[8] have been well defined, a few merit discussion in terms of occupational homicide surveillance. Surveillance based on death certificates alone underreports cases of fatal occupational injuries. State studies have shown between 67 percent and 88 percent of all traumatic workplace deaths can be identified using death certificates alone.[19] Legal sources such as police files and medical examiner records are more detailed; however, they do not regularly identify work-related cases and are not readily accessible in most US jurisdictions. Death certificates provide systematic accounts of each traumatic death in the US, and not those reported to have occurred at work. Death certificates record "usual" occupation and industry of employment, not necessarily employment at the time of injury. Studies show that between 64 percent and 74 percent of reported usual occupations correspond with decedents' most recent occupations, and between 60 percent and 76 percent of the usual industry entries correspond with most recent industries of employment.[16-18]

Both formal state policies and individual practices affect case ascertainment and data accuracy. The most notable weakness is lack of standard criteria for completing the injury at work item; it is not rigorously defined and is subject to interpretation. For example, in Louisiana a state policy existed where "injury" was interpreted as "accidental injury." Until 1985, the injury at work item was not completed for intentional injuries. Even when injuries that take place at work are correctly recorded, some states automate that information only for unintentional injuries. In these states all homicides and suicides must be screened to find each noted as having occurred at work. This screening is tedious and through human error intentional injury cases may be missed.

A certifier may also impose an idiosyncratic definition of work that excludes or obscures employment. No prostitutes or illicit drug dealers are identifiable in the NTOF data. Juveniles are rarely considered "at work." Deaths perpetrated by acquaintances or family members may be screened by a certifier who considers "at work" to mean solely work-related. Homicides are also misclassified as accidents, suicides, or deaths of undetermined cause. For such reasons, the cases here underreport victimization among working women in the US.

While such factors can hinder hazard identification and ultimately injury control, NTOF surveillance rapidly identified homicide as the major occupational hazard for the nation's women. Homicide risk may be associated with exposure to the public, the exchange of money, and evening employment.[5–7,20] Women employed in the retail industry, particularly in food stores, were at greatest risk. Many owned or managed groceries, taverns, and restaurants. Elevated homicide rates in

motor freight and warehousing, local passenger transportation, government, and law enforcement call for heightened safety for workers in these jobs. Detailed studies of homicide risk in education, health services, hotels, motels, and other lodging places are also warranted.

The role of victim age in these deaths is still not clear. Older women may be attractive targets and/or less likely to survive traumatic assault. This analysis also showed that older women were often self-employed or small-business owners. While Davis, *et al*, argued that high workplace homicide rates in Texas women age 65 years or older did not result from underenumerated employment,[5] the person-year denominators used in the NTOF age rates may distort the risk estimates. For example, low rates among young women may reflect part-time work. Age-specific homicide rates should be examined using hour-based employment information when available.

Most of the women died from gunshot wounds. Close physical contact deaths were significantly elevated among older White women and among Asians, a group generally noted for low risk of violent death.[21] Because control strategies may depend on discrimination between robbery assault and personal or sexual violence, more detailed studies are needed on the circumstances of workplace homicides.

At least one major convenience store chain has implemented robbery deterrence programs which couple behavioral and environmental components.[22] In evaluated programs, employees have been trained in techniques of conflict resolution and nonviolent response.[21–24] Locked drop-safes, well-lit parking lots, and a work area openly visible to the public are environmental components that appear to reduce robbery and associated mortality.[22]

Convenience stores are essentially small businesses with control strategies that might prove useful in small, owner-operated businesses. Before recommending use of their control strategies developed in other environments, performance in the new environment should be rigorously evaluated.

Hazardous industries may also benefit from regulation, particularly where employers have not reduced homicide risk. The Occupational Safety and Health Administration (OSHA) standards do not yet explicitly address safety from workplace violence, but an increasing number of local ordinances mandate hours for store operation or the presence of multiple employees. The next step in reducing the risk of workplace homicide is to evaluate the effectiveness in various work settings of existing as well as new control strategies. □

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