

Industries and Occupations at High Risk for Work-Related Homicide

Dawn N. Castillo, MPH

E. Lynn Jenkins, MA

Homicide is the third leading cause of injury death in the workplace. The death certificate-based National Traumatic Occupational Fatalities surveillance system and estimates of annual employment were used to calculate average annual rates of work-related homicide for detailed industries and occupations for the nation for 1980 to 1989. Workers in the taxicab industry had the highest rate of work-related homicide (26.9 per 100,000 workers). High rates were also identified for workers providing public and private security, and in a number of retail trade and service industries. For many high-risk industries, the risk was excessive for male workers only. Differences between rates for black and nonblack workers varied across industries and occupations. Immediate efforts to protect workers, and long-term efforts to describe and study work-related homicide thoroughly and to evaluate interventions are needed.

The pervasiveness of violence in today's society is indisputable. An average of more than 21,000 homicides were committed each year in the United States from 1979 through 1988.¹ At least 750 homicide victims each year were killed while at work.² Although work-related homicides are a small proportion of all homicides, the substantial contribution of homicide to work-related deaths in the United States, unique features of homicide in the workplace, and the potential for workplace-specific prevention programs demonstrate the importance of examining this subset of homicides separate from the larger group of all homicides.

The National Institute for Occupational Safety and Health (NIOSH) identified homicide as the third leading cause for occupational injury death in the United States in the 1980s.³ Twelve percent of all injury deaths in the workplace were homicides. Only motor vehicle (23%) and machine-related (14%) incidents accounted for more deaths.

Homicides in the workplace are not simply a microcosm of the larger universe of all homicides. There is evidence that the circumstances of homicide in the workplace are unique. In 1988, more than half of all homicide victims were killed by family members or acquaintances, and only 13% were reported to have occurred in association with another felony.¹ In a study of workplace homicides of male victims in Texas, Davis⁴ reported that only 13% of the workplace homicides involved family members or acquaintances, and 48% occurred during robberies. Employment may introduce a risk for homicide among certain groups that is not seen in the general population. Whereas in the general population of adults, persons 65 years

From the Injury Surveillance Section, Surveillance and Field Investigations Branch, Division of Safety Research, National Institute for Occupational Safety and Health (Ms Castillo, epidemiologist; Ms Jenkins, Acting Chief).

Address correspondence to: Dawn N. Castillo, MPH, Division of Safety Research, National Institute for Occupational Safety and Health, 944 Chestnut Ridge Road, Mail Stop 180, Morgantown, WV 26505.

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and older have the lowest rates of homicide,¹ studies have demonstrated that this age group has the highest rates of work-related homicide.^{2,4-7}

Although efforts to prevent violence in society would undoubtedly have an impact on homicide in the workplace, efforts specific to the workplace are possible and would be more efficient and have a more timely impact. The development of workplace-specific prevention programs requires the identification of worker groups at greatest risk, so that risk factors can be hypothesized and investigated, and targeted intervention efforts designed and evaluated. Studies in California⁸ and Texas^{4,6} have identified specific industries and occupations at increased risk for work-related homicide: taxicab service, law enforcement, private-security, and certain retail trade industries. It has not been determined whether these industries and occupations are at high risk across the nation, or only within these two states. Furthermore, there may be industries and occupations at high risk for work-related homicide that were not identified in California or Texas because the employment in a particular industry or occupation was insufficient to detect increased risk for homicide, or because of unique characteristics within those states.

An overview of work-related homicides in the United States for the years 1980 through 1988, with distributions by time of day and method of homicide, and rates by age and gender, broad occupation and industry groups, and region of the United States has been published previously by NIOSH researchers.² The current paper identifies specific industries and occupations at high risk for occupational homicide in the United States. Because the number of homicides within specific industries and occupations may be small for individual years, and variable across years, data were aggregated over a 10-year period from 1980 through 1989. This aggregation of data across a decade also permits the computation of rates for demographic subpopulations of workers. Work-related homicide rates of female victims in detailed industries⁶

and occupations⁷ have been determined in previous studies when the incidence was sufficient. Homicide rates of blacks within detailed industries and occupations have not been presented in previous research.

Methods

The National Traumatic Occupational Fatalities (NTOF) surveillance system compiles death certificates from the 50 states, New York City, and the District of Columbia for all deaths satisfying the following criteria: the worker was 16 years of age or older, an external cause of death was reported according to the *International Classification of Diseases, Ninth Revision* (ICD-9),⁹ and the certifier responded positively to the "Injury at Work?" item. Bell et al¹⁰ provide a thorough discussion of the methods and limitations of the NTOF surveillance system.

Homicides in NTOF were analyzed for the years 1980 through 1989. Homicides were identified using the ICD-9 codes E960 through E969, "Homicide and injury purposely inflicted by other persons."⁹ Homicides due to legal intervention and operations of war are not included in this group of codes.

Before 1985, data on work-related homicides were not available for Louisiana, Nebraska, New York, and Oklahoma because of recording practices in those states. As procedures were altered in each state, data on homicides were obtained for subsequent years. The results have not been adjusted for these missing data.

Industry and occupation were coded based on the narrative entries from the designated blocks on the death certificate. Industry was coded according to the *Standard Industrial Classification (SIC) Manual*, 1987¹¹; occupation according to the Bureau of the Census 1980 classification scheme.¹² Both the SIC and the Bureau of the Census have hierarchical coding structures in which detailed codes can be collapsed into broader groups. Software developed at NIOSH effectively codes narratives from the death certificates into SIC industry divisions and broad occupation

groups,¹⁰ but not to the detailed levels required for this analysis. All work-related homicides were manually reviewed, and detailed industry and occupation codes were assigned when sufficient detail was present on the death certificate.

Denominator data for the calculation of average annual fatality rates were based on monthly surveys of approximately 60,000 households nationwide by the Bureau of the Census for the Bureau of Labor Statistics. Estimates for civilian workers are published annually.¹³ Because comparable employment data were not available for military personnel, 73 work-related homicides of military personnel were excluded from the analyses.

The Bureau of Labor Statistics publishes estimates of employment for detailed industries and occupations for all workers and the following subgroups: women, blacks, and Hispanics.¹³ Estimates of employment were used to calculate work-related homicide rates for all workers, men, women, blacks, and nonblacks. Rates for white workers in detailed industries and occupations were not calculated because white-specific employment data cannot be derived from the published figures. Because Hispanic origin was not added to the US Standard Certificate of Death until 1989,¹⁴ rates were not calculated for Hispanics. Estimates of the age distribution of workers within each detailed industry and occupation, and the distribution of these industries and occupations by state are not available from published employment figures. Therefore, it was not possible to adjust the industry and occupation rates by age or adjust for missing data from states that did not provide death certificates for work-related homicides in the early years of the surveillance effort.

Except where noted, industry rates were calculated for the entire period of study, 1980 through 1989. Because the Bureau of the Census changed its coding scheme for occupations in 1983, occupation rates were calculated for the 7-year period 1983 through 1989. Industry and occupation rates for blacks were calculated for 1983 through 1989 because before

1983, estimates presented in the published figures for blacks included other races.¹³

Because of the instability of rates based on small numbers, rates were not calculated when there were fewer than 10 homicides during the period of analysis. The studies of work-related homicides in Texas also set 10 as the minimum number of fatalities for which a rate would be calculated.^{4,6}

Work-related homicide rates computed in this analysis were too numerous to present in their entirety. Only rates for those industries and occupations whose rate were at least twice the national average annual fatality rate for all workers, 0.71 homicides per 100,000 workers, are presented in this paper. Thus, rates are presented when the occupational homicide rate was at least 1.42 per 100,000 workers.

Results

Analysis of NTOF identified 7,581 work-related homicides of US civilian workers from 1980 through 1989. The average annual rate of work-related homicide for all workers was 0.71 homicides per 100,000 workers.

Eighty percent (6,050) of work-related homicides were of men. The rate for male workers (1.02 per 100,000 workers) was more than three times the rate for female workers (0.33 per 100,000 workers). Seventy-four percent (5,629) of the work-related homicides were of white workers who had a rate of 0.6 homicides per 100,000 workers. Black workers accounted for 19% (1,470) of work-related homicides, workers of other races for 6% (447), and race was unknown for 35 of the work-related homicides. The work-related homicide rates for black workers (1.42 per 100,000 workers) and workers of other races (1.57 per 100,000 workers) were more than twice the rate for white workers (0.60 per 100,000 workers).

Detailed Industry

Information on the death certificate lacked the detail necessary to assign an SIC industry division code for 10% of the work-related homicides (Table 1). In addition, of those work-related homicides with an industry division

TABLE 1

United States Work-Related Homicides, 1980 through 1989: Frequencies, Rates, and Completeness of Coding to Detailed Industries by Standard Industrial Classification (SIC) Division

SIC Division	N	Rate*	Coded to Detailed Industry	
			n	%
Agriculture/forestry/fishing	185	0.54	93	50%
Mining	40	0.44	37	93%
Construction	257	0.38	95	37%
Manufacturing	506	0.28	364	72%
Transportation/communications/public utilities	678	0.93	654	97%
Wholesale trade	108	0.25	82	76%
Retail trade	2787	1.57	2598	93%
Finance/insurance/real estate	242	0.35	206	85%
Services	1276	0.39	1248	98%
Public administration	730	1.42	715	98%
Not classified	772			
	7581			

* Average annual rate of work-related homicide per 100,000 workers in each industry division.

code, not all could be assigned detailed codes. The ability to assign a detailed industry code varied by SIC division. Industry divisions with less than 93% of cases coded to detailed levels had low average annual rates for work-related homicide (less than 0.6 per 100,000 workers). It is unlikely that within an industry division a detailed industry at high risk for occupational homicide was not identified because of cases that were not classified.

Table 2 provides crude, male-, female-, black-, and nonblack-specific average annual rates for detailed industries at high risk for occupational homicide (at least 2 times the average annual rate of 0.71 homicides per 100,000 workers). Nearly 30% of all civilian occupational homicides occurred in three high-risk industries: grocery stores; eating and drinking places; and justice, public order, and safety. The justice, public order, and safety industry includes courts, police protection, legal counsel and prosecution, correctional institutions, and fire protection.

The work-related homicide rate for the taxicab service is nearly 40 times greater than the rate for all workers, and over three times greater than the industry with the next highest rate, liquor stores. Male rates exceeded fe-

male rates in all high-risk industries for which a female rate could be calculated. In three high-risk industries (justice, public order and safety; hotels and motels; and eating and drinking places), risk occurred primarily among men; women had low rates of work-related homicide in these industries. Women had high rates of occupational homicide in the liquor store, gasoline station, and grocery store industries only. Blacks in the taxicab service had the highest rate of work-related homicide of any group. Among those industries in which a black-specific rate could be calculated, the homicide rate for nonblack workers exceeded the rate for black workers in only two: justice, public order and safety; and hotels and motels.

The crude rate for numerous industries masked high rates of homicide among demographic subpopulations of workers. A number of retail establishments and a few service industries had high rates for men, but not overall (Table 3). Although the crude rates for auto repair shops and urban transport were low, rates among black workers were elevated.

Occupation

Detailed occupation codes could be assigned to 6,613 cases (Table 4). The

TABLE 2

Crude, Male-, Female-, Black- and Nonblack-Specific Frequencies and Rates of Work-Related Homicide for High-Risk* Detailed Industries, United States, 1980 through 1989

Industry (SIC Code)	Total		Men		Women		Blacks‡		Nonblacks‡	
	Deaths	Rate†	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate
Taxicab service (412)	287	26.87	279	29.40	8	ND§	114	41.89	173	19.59
Liquor stores (592)	115	7.96	97	10.40	18	3.53	19	13.98	96	6.35
Gasoline stations (554)	304	5.56	266	6.11	38	3.41	44	10.65	260	3.77
Detective and protective services (7381, 7382)	152	4.96	143	5.78	9	ND	41	5.13	111	3.88
Justice, public order, and safety (92)‡	640	3.42	614	4.54	26	0.60	79	3.09	561	3.47
Grocery stores (541)	806	3.24	562	4.31	244	2.06	82	3.88	724	2.87
Jewelry stores (5944)	56	3.22	46	6.63	10	0.96	1	ND	55	2.69
Hotels and motels (701)	153	1.54	106	2.52	47	0.82	20	1.15	133	1.43
Barber shops (724)	14	1.48	14	1.78	0	ND	7	ND	7	ND
Eating and drinking places (58)	734	1.45	518	2.42	216	0.74	128	2.09	606	1.17

* At least twice the average annual work-related homicide rate for all workers, 0.71 per 100,000.

† Average annual work-related homicide rate per 100,000 workers in each detailed industry.

‡ Frequency for 1980 through 1989; average annual rate for 1983 through 1989.

§ ND, Not determined due to the instability of rates based on small numbers.

TABLE 3

Crude and Specific Frequencies and Rates of Work-Related Homicide for Detailed Industries at High Risk* for Men and Blacks Only, United States, 1980 through 1989

Industry (SIC Codes)	Total		Specific Group	
	Deaths	Rate†	Deaths	Rate
Men				
Variety stores (533)	11	0.81	10	2.99
Book and stationery stores (5942, 5943)‡	22	1.34	17	2.42
Laundry, cleaning and garment services (721)	59	1.36	36	1.97
Food stores, not elsewhere classified (542, 543, 544, 549)	23	1.26	19	1.96
Beauty shops (723)	29	0.43	14	1.81
Direct selling establishments (5963)‡	16	0.50	15	1.77
Drug stores (591)	37	0.73	31	1.65
Apparel and accessory stores, except shoe (56, except 566)	47	0.63	26	1.56
Automotive services except repair (751, 752, 754)	38	1.28	36	1.48
Shoe stores (566)	15	0.92	11	1.44
Blacks‡				
Auto repair shops (753)	106	1.19	21	3.62
Bus service and urban transport (41, except 412)	31	0.66	15	1.48

* At least twice the average work-related homicide rate for all workers, 0.71 per 100,000.

† Average annual work-related homicide rate per 100,000 workers in each detailed industry.

‡ Frequency for 1980 through 1989; average annual rate for 1983 through 1989.

one occupation group with less than 95% of cases coded to detailed levels—farming, forestry, and fishing—had a low rate of work-related homicide. It is unlikely that within an occupation group a detailed occupation at high risk was not identified because of cases that were not classified.

Table 5 provides crude, male-, female-, black-, and nonblack-specific

rates for detailed occupations at high risk for occupational homicide. Sales supervisors and proprietors had considerably greater numbers of work-related homicide than did any other single occupation. The occupations for which women had the greatest risk of work-related homicide were stock handlers and baggers, police and detectives, and hotel clerks. Stock han-

dlers and baggers was the only occupation in which the rate for women exceeded that for men. Work-related homicide rates among blacks were considerably greater than rates for nonblack workers among taxicab drivers and chauffeurs, garage and service station-related occupations, nonpublic service guards and police (security guards), and sales supervisors and proprietors. In contrast, the rate for stock handlers and baggers was lower for blacks than for nonblack workers.

As with industry, the crude rate for a few occupations masked high rates of work-related homicide among demographic subpopulations of workers. Although crude rates for cashiers (0.58 homicides per 100,000 workers) and sales workers of other commodities (0.95 per 100,000 workers) were low, men in these occupations were at increased risk for occupational homicide (50 homicides, 1.85 per 100,000 male cashiers; 44 homicides, 1.64 per 100,000 male sales workers of other commodities). Sales of food products are included in the sales workers of other commodities category. Although crude rates for automobile mechanics (0.86 homicides per 100,000 workers) and construction laborers (0.80 per 100,000 workers) were low, black workers in these occupations were at increased risk for work-related homicide (12 homicides, 2.57 per 100,000 black automobile mechanics; 18 hom-

icides, 2.28 per 100,000 black construction laborers).

Comment

Limitations of NTOF for occupational fatality surveillance have been well described for fatalities in general,¹⁰ and homicides specifically.⁷ Limitations result from the inability

of states to identify and retrieve death certificates for work-related fatalities, and the accuracy of industry and occupation information on death certificates. The crux of these limitations is that the rates and frequencies presented in this paper are conservative and underestimate the true impact of homicide in the workplace.

In a review of 10 studies using mul-

tiple sources to identify the universe of fatal work-related injuries, Stout and Bell¹⁵ reported that, on average, death certificates captured 81% of work-related injury deaths. In addition to general underreporting of work-related injury deaths by death certificate-based surveillance systems, we are aware of specific underreporting of homicides during the early years of NTOF surveillance because of recording practices in four states. Although it is possible to estimate the number of work-related homicides that may have occurred in these four states,¹⁶ it is not possible to determine how these homicides would have been distributed across specific industries and occupations.

Variations in the accuracy of industry and occupation information is a limitation of using death certificates for mortality surveillance. Studies have demonstrated agreement of 60% to 76% between usual industry and occupation entries on the death certificate and employment at the time of death.¹⁰ Looking specifically at work-related homicides, Davis¹⁷ found an overall accuracy of 72% for industry information on the death certificate using information from medical examiner reports. Among high-risk industries (food stores; eating and drink-

TABLE 4

United States Work-Related Homicides, 1980–1989: Frequencies, Rates, and Completeness of Coding to Detailed Occupations by Bureau of the Census (BOC) Occupation Group

BOC Occupation Group	N	Rate*	Coded to Detailed Occupation	
			n	%
Executive, administrative, and managerial	1029	0.85	1024	99%
Professional Specialty	329	0.24	322	98%
Technicians and related support	43	0.13	43	100%
Sales	1661	1.33	1576	95%
Administrative support, including clerical	316	0.18	315	99%
Service	1395	0.98	1388	99%
Farming, forestry, and fishing	181	0.51	154	85%
Precision production, craft and repair	491	0.38	472	96%
Machine operators, assemblers and inspectors	158	0.19	153	97%
Transportation and material moving	556	1.23	538	97%
Handlers, equipment cleaners, and laborers	629	1.37	628	99%
Not classified	793			
	7581			

* Average annual rate of work-related homicide per 100,000 workers in each occupation group.

TABLE 5

Crude, Male-, Female-, Black-, and Nonblack-Specific Frequencies and Rates of Work-Related Homicide for High-Risk* Detailed Occupations, United States, 1983 through 1989

Occupation (BOC Code)	Total		Men		Women		Blacks		Nonblacks	
	Deaths	Rate†	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate
Taxicab drivers and chauffeurs (809)	197	15.11	193	14.80	4	ND‡	79	27.62	118	11.59
Sheriffs, bailiffs and other law enforcement officers (423)	73	10.86	72	12.37	1	ND	6	ND	67	11.13
Police and detectives, public service (418)	267	8.96	256	9.37	11	4.44	32	8.89	235	8.97
Hotel clerks (317)	29	5.10	18	10.84	11	2.74	3	ND	26	4.94
Garage and service station-related occupations (885)	83	4.46	76	4.36	7	ND	13	7.07	70	4.17
Guards and police, except public service (426)	160	3.57	153	3.97	7	ND	49	5.13	111	3.14
Stock handlers and baggers (877)	189	3.13	102	2.17	87	6.55	13	1.91	176	3.29
Supervisors and proprietors, sales occupations (243)	662	2.75	555	3.37	107	1.41	57	5.90	605	2.62
Supervisors, police and detectives (414)	12	2.21	12	2.35	0	ND	1	ND	11	2.23
Barbers (457)	14	2.19	13	2.44	1	ND	7	ND	7	ND
Bartenders (434)	49	2.13	31	2.66	18	1.59	7	ND	42	1.89
Correctional institution officers (424)	19	1.51	17	1.63	2	ND	4	ND	15	1.55

* At least twice the average annual work-related homicide rate for all workers, 0.71 per 100,000.

‡ Average annual work-related homicide rate per 100,000 workers in each detailed occupation.

§ ND, Not determined due to the instability of rates based on small numbers.

ing places; gasoline service stations; justice, public order, and safety; taxicab service; detective and protective services; and hotels, motels, and lodging places) the accuracy increased to 93%.

The query for "usual" industry and occupation on the death certificate and vague entries in these fields contribute to misclassification because the industry and occupation of workers who died cannot be assigned. About 10% of death certificates in this analysis had insufficient information to assign an industry division or an occupation group. Substantial numbers of homicides may not be counted in some industries and occupations. Thirty-two percent of the cases in NTOF for which an occupation group could not be assigned reported "usual occupation" as student or housewife. Davis¹⁷ has demonstrated that the majority of homicide victims with these types of entries were working in high-risk industries at the time of death, resulting in an underestimate of workers killed in high-risk industries.

Despite these limitations, analysis of NTOF data provides important data needed to address homicide in the workplace. Although frequencies and rates presented in this paper must be considered conservative estimates, it is unlikely that industries and occupations identified as being at high risk were falsely classified. Information provided by this research should be used to target efforts to identify risk factors for work-related homicide, and for the development and evaluation of intervention efforts.

Based on studies in California⁸ and Texas,^{4,6} Kraus and Davis hypothesized that providing public or private security and the exchange of money increased a worker's risk for occupational homicide. Data presented in this paper are consistent with these hypotheses. Examining characteristics of specific high-risk industries and occupations suggest additional etiologic hypotheses and potential countermeasures.

Taxicab drivers had the greatest risk for occupational homicide. In addition to the exchange of money, there are other characteristics of being a

taxicab driver that may increase the risk for occupational homicide. Working alone, in the late evening and early morning hours, with their back to potential assailants, and the capacity of a phone call to dictate the location of the driver may also increase taxicab drivers' risk for occupational homicide. Measures suggested to prevent interpersonal injury to taxicab drivers include carrying small amounts of cash, nonresistance during robbery, bullet-proof barriers between the driver and passengers' seats, arrangements in which either police or cab drivers routinely pull over operating cabs to check on the driver's safety, and trouble lights to alert others that a taxicab driver is in danger.^{18,19}

Five of the 13 high-risk occupations provide public or private security: sheriffs, police and their supervisors, security guards, and correctional institution officers. Characteristics of these occupations that may increase a worker's risk for homicide include working alone or in small numbers, working in the late evening or early morning hours, working in high crime areas, and, in the case of private security, guarding something of value. Increased exposure to criminals and volatile situations may also play a role in the occupational homicide of these workers. Improved training; effective use of dispatching, telephone, and computer equipment; and body armor have been suggested as ways to prevent homicide of workers in law enforcement.²⁰ Such measures also may be effective in curbing the homicide of workers in public security.

The large number of occupational homicides associated with retail trade and service industries support the hypothesis that exchange of money increases the risk for occupational homicide. Information on precipitating circumstances are rarely available from death certificates, which are the basis of NTOF. The study in Texas, however, linked death certificates to medical examiner records, and found that nearly half of the work-related homicides involved robbery.^{4,6} Environmental and behavioral approaches such as good external lighting, visibil-

ity of the cash register and clerk from outside the store, use of drop safes to minimize cash on hand, signs communicating low cash levels, increased staffing, and training in conflict resolution and nonviolent response have been proposed as methods to reduce robbery and associated violence in convenience stores.^{21,22} Bullet-resistant enclosures may also be appropriate for some high-risk retail trade establishments to prevent injury to employees.

Large amounts of money are maintained on-site and money is exchanged at financial institutions, yet the risk of occupational homicide to employees of financial institutions is low. A comparison of financial institutions to high-risk retail trade and service industries may provide insight into avenues for prevention. Security measures, such as silent alarms and surveillance cameras, limited hours of operation, and typically high staffing may protect employees of financial institutions from occupational homicide.

The preponderance of men, and increased risk for occupational homicide of men compared with women, has been reported previously.^{2,4,5,8,23} It should be noted, though, that rates in this and other studies were calculated using denominators that did not take into account hours of work. Because women are more likely than men to work part-time (in 1989, 27% of women worked part-time compared with 11% of men¹³), the differences in risk per hour on the job between men and women may not be as great as indicated by published rates. Possible explanations for a differential risk of workplace homicide in men and women include: (1) differential exposure of men and women in the same occupations and industries to conditions in the workplace that increase the risk for homicide, (2) the representation of women in some high-risk occupations is too small to identify risk, (3) confrontations are more likely with men, and (4) confrontations are more likely to escalate to homicide with men.

Davis⁴ has shown that black men and men of other races have greater

rates of work-related homicide than do white men in Texas. The present study is the first to examine rates for black workers in specific industries and occupations. A consistent pattern between black and nonblack rates was not found. However, the rate among black workers was at least twice the rate of nonblack workers for the taxicab service and drivers, liquor stores, gasoline stations, and sales supervisors and proprietors. In addition, blacks were the only workers found to be at elevated risk for homicide in auto repair shops and bus services. Research assessing the relative contributions of race and exposure to environmental conditions that may impact risk of occupational homicide, such as crime rate of the surrounding area, are needed.

Studies of work-related homicide have demonstrated differential risk by age. Workers over 65 years of age consistently display the highest rates of work-related homicide.^{2,4-7} Without data on the age distribution for detailed industries and occupations, it is not possible to determine whether the rates of certain occupation or industry groups are elevated by virtue of a large proportion of the work force being 65 years or older.

Because estimates of employment within detailed industries and occupations were not available for detailed geographic areas, it was not possible to assess differences in risk between urban and rural areas. Data from Texas suggest that rates of homicide among men in retail trade were nearly twice as large in Standard Metropolitan Statistical Areas with a population of 500,000 or greater than in smaller areas.⁴ This difference was not observed for nonretail trade industries.

The rate and large number of work-related homicides in the United States are unacceptable; efforts to curb the toll of homicide on the nation's work force must be undertaken. A dual approach for the prevention of severe occupational injuries has been proposed.²⁴ This model should be adopted for the prevention of work-related homicide. This approach involves immediate action to protect those workers at greatest risk, long-

term efforts to describe and study occupational homicide thoroughly, and development and rigorous evaluation of the efficacy of intervention strategies.

Employers and advocates of employees at high risk for occupational homicide should take prompt action to minimize the risk of occupational homicide. Factors or situations in the workplace which may place the employee at risk should be evaluated and interventions addressing these hypothesized risks carefully considered. Previously implemented approaches, such as those discussed above, may be relevant, or original measures specific to the industry or occupation under question may be identified.

A major long-term effort must be made to describe occupational homicide more thoroughly, to identify conditions in the workplace that increase risk, and to evaluate intervention efforts rigorously. Information available from death certificates is limited. Studies need to be undertaken in which multiple data sources are utilized to provide a more complete picture of occupational homicide. Analytic studies quantifying risk associated with specific work practices are needed to develop effective intervention programs. Finally, existing and new prevention strategies must be evaluated rigorously before they can be recommended and implemented on a large scale.²⁵

There are currently no specific regulations from the Occupational Safety and Health Administration addressing the prevention of work-related homicide. If standards are to be developed, they should be based on a thorough understanding of the epidemiology of work-related homicide in each high risk group.

In summary, homicide in the workplace is an occupational health problem of significant proportion. Specific worker groups at greatest risk of occupational homicide have been identified. Available information and technology must be employed in an effort to protect these workers from occupational homicide. Research to better elucidate the dynamics of workplace homicide and identify the most

effective intervention strategies is needed.

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Zola in London

In September, 1893, Emile Zola made his first visit to England, where his novels had been denounced in Parliament as "fit for swine" and their author accused of "wallowing in immorality." Despite this, he received a warm welcome, and the anniversary of his visit is being marked with an exhibition. . . . Zola, then 53 and France's best-known writer, had achieved fame and fortune with his 20 novels portraying life under the Second Empire. His subjects—alcoholism, prostitution, industrial strife—and the realism of his writing often provoked controversy. He believed that an analysis of society in line with his Naturalist theories could lead to reform.

On September 20, 1893, Zola arrived with his wife and a dozen French journalists at Victoria Station and was taken to the Savoy Hotel. He was feted at every [Conference of the Institute of Journalists]. . . . Lincoln's Inn was the setting of his main speech, on Anonymity in the Press. . . he maintained that the English practice of not signing political articles upheld the power of the press, but considered that authors of literary and drama criticism should be named. He also proposed that anonymous staff writers should receive pensions, "the bread of their old age."

Zola traveled home hoping his books would arouse less antagonism in England and that this would aid his election to the Académie Française. However, his detractors soon renewed their attacks—the Bishop of Worcester called Zola a corrupter of minds and souls and the headmaster of Harrow School declared him "infamous"—and he never became a member of the Académie.

Five years later Zola crossed the channel again, this time in flight. His quest for justice in the Dreyfus Affair had prompted him to pen his famous open letter, *J'accuse*, which led to his prosecution for libel. By evading the one-year prison sentence he could keep the case open; here [his English translator and son of his English publisher] Henry Vizetelly found him shelter. Under assumed names he spent 11 months in hotels and rented houses in Surrey and south London, visited in turn by his wife and his mistress, the latter accompanied by their two young children. He missed his home and his dog, and, apart from kippers, disliked English food, with its boiled potatoes and watery vegetables—"God sent us food, but the devil invented English cooks." As a break from writing, he bicycled around the countryside with his camera. In June, 1899, when news came of a re-trial for Dreyfus, he returned to Paris.

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