

Racial Differences in Occupational Firearm Homicides, 1993-97

Between 1993 and 1997, nonwhite workers experienced a significantly greater risk of fatality by firearm in 8 of 10 industries than white workers did.

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Homicides account for a significant proportion of occupational deaths each year. In the majority of these deaths, a firearm is used in the commission of the homicide in industries prone to robbery. This article presents the results of a study of the influence that race of the worker has upon the risk of being the victim of an occupational firearm homicide. Data from the Census of Fatal Occupational Injuries (CFOI) for 1993 to 1997 form the cornerstone of the analysis.

Some background

Over the years, homicides have consistently been one of the leading causes of occupational fatalities.¹ The large percentage of occupational homicides coincides with the large number of occupational assaults against workers that occur each year. Between 1992 and 1996, for example, more than 2 million U.S. residents fell victim to violent crime each year while at work or on duty.² In 1993, 22,396 nonfatal assaults were reported, resulting in injuries to 1,063 workers.³

Of the 6,200 job-related fatalities each year, approximately 17 percent are homicides.⁴ Over the years, however, there have been decreases in the homicide rate, which has fallen to its lowest level since the inception of the fatality census in 1992.⁵ Job-related homicides

totaled 645 in 1999, a 10-percent drop from the 1998 total and a 40-percent decline from the 1,080 homicides that occurred in 1994, which had the highest annual count over the 1992-99 period. The decline was pronounced in retail trade, where homicides fell by 51 percent from 1994 to 1999.⁶ During this period, the retail trade industry accounted for between 43 and 54 percent of all fatalities in a given year. Despite improvements in recent years, homicides are still the third leading cause of death in the workplace, with more than 1,000 homicides annually.⁷

Persons committing robberies and related crimes—individuals usually unknown to the victims—accounted for three-fourths of 1,063 homicides at work in 1993.⁸ Bureau of Labor Statistics (BLS) data point to robbery as the primary motive for these deaths.⁹ Violence by coworkers and by customers or clients was identified as the second most common cause of homicides. In a study of all violent attacks in the workplace resulting in fatalities and injuries, women were just as likely as men to be victims of theft while working.¹⁰

Studies indicate that firearms are the most frequently used weapons in occupational homicides. Shootings are the most frequently occurring violent act, accounting for the majority of all homicides.¹¹ From 1992 to 1996, ap-

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proximately 83.7 percent of all workplace homicides involved the use of a firearm.¹² Of those victims who received gunshot wounds while a crime was taking place, 87 percent were male.¹³ In regards to firearm homicides by race, approximately 47 percent of all victims were black males, 35 percent white males, 9 percent white females, and 7 percent black females. Differences between black and nonblack workers varied across industries and occupations.¹⁴

The occupation one chooses and the industry in which one works are two of the greatest risk factors for being the victim of an occupational homicide. Inequalities in access to the labor market and unequal distribution of risk within jobs are potential explanations for racial disparity in occupational fatalities.¹⁵ Occupations with high numbers of homicides include those in which workers typically engage in cash transactions or have valuables on hand, such as managers of food and lodging establishments, sales supervisors and proprietors, cashiers, and taxicab drivers.¹⁶ For many high-risk industries, the risk is excessive for male workers only.¹⁷

In 1993, for example, the occupation with the largest share of occupational homicides was taxi drivers and chauffeurs, with a rate of 43.1 per 100,000 employed.¹⁸ This occupation accounted for almost one-tenth of all victims but for fewer than one-half of 1 percent of the workforce. Gas station attendants, sales counter clerks, and police each had a homicide rate of approximately 11 workers per 100,000 over the period studied.¹⁹ Estimates indicate that approximately 100 workers each year are murdered while working in convenience stores.²⁰

Racial differences in workplace homicides have been identified in various studies.²¹ Discussions in public health literature have focused on the extent to which racial differences in the risk of being fatally injured at work are explained by labor market forces that might lead to a concentration of African Americans in inherently dangerous types of jobs. A study conducted by Dana Loomis and David Richardson

indicated that the jobs held by whites and those held by African Americans in North Carolina differed substantially, and that this distinction appears to account for much of the workplace mortality differential. National Institute of Occupational Safety and Health (NIOSH) data from 1980 through 1989 indicate that the homicide rate for African American workers was higher than that of all other races, and was 2.4 times higher than that of white workers.²² Nationwide, the workplace homicide rates were 6.5 deaths per 100,000 for blacks, 5.8 per 100,000 for whites, and 4.9 per 100,000 for other races.²³

Scope and method of the present study

Data. Data from the BLS Census of Fatal Occupational Injuries (CFOI) were used in this study. Occupational fatalities occurring between 1993 and 1997 that resulted from shooting deaths were included for analysis. The CFOI is an official, systematic, verifiable count of fatal occupational injuries that occur during the year. It has been adopted by the National Safety Council and other organizations as the authoritative source for a count of fatal work injuries in the United States.²⁴

To ensure that the fatalities are work related, cases are substantiated with two or more source documents, or a source document and a followup questionnaire. The work-related deaths were classified as such if a work relationship was established. A work relationship was established if an event or exposure resulted in a fatal injury or illness of a worker on the employer's premises or of a worker who was off the premises but in work status.

In each case, the circumstances surrounding the event, cause of death, industry in which the worker was employed at the time of the death, and race of victim were determined. Cases were classified according to their major standard industrial classification group, following the methodology outlined in the Standard Industrial Classification manual.²⁵

Descriptive analysis. An analysis was performed to describe the characteristics of situations that most frequently resulted in an occupational fatality. The descriptive analysis included a summary of homicides by industry and by race. Racial group classifications for the CFOI data included white, black, American Indian, Asian, and other.

Relative risk for occupational firearm homicides. The relative risk of falling victim to occupational homicide by firearm was calculated by race and industry, with the incidence of homicides based upon person-years of exposure. The person-years of exposure were determined using the total number of employed persons for each year of the 5-year period covered in this study. Employment data were obtained from BLS. The relative risks were derived by comparing the incidence of occupational firearm homicides per 100,000 person-years for white workers to the incidence of occupational firearm homicides per 100,000 person-years for workers of other races.

The relative risks were determined to be significant using 95-percent confidence intervals, following the procedures described by Abraham M. and David E. Lilienfeld.²⁶ Relative risks, adjusted log-relative risks, and 95-percent confidence intervals were computed in a manner that compared the incidence of occupational firearm homicides of white workers with those of nonwhite workers.

Findings from the CFOI

Descriptive analysis. From 1993 to 1997, 31,678 occupational fatalities were reported in the CFOI data set. Of these, 4,977 (16 percent of all fatalities) were the result of an assault or violent act. Of all assaults or violent acts that resulted in an occupational death, 4,049 fatalities (81 percent) were the result of an occupational firearm homicide. Forty-four cases for which industry data were not available were removed from the analysis.

Homicides by race. Approximately 64

Table 1. Number of occupational firearm homicides, by race and year, 1993-97

Race	Year					Total ¹
	1993	1994	1995	1996	1997	
White	562	587	462	482	458	2,551
Black	146	185	171	150	133	785
American Indian	5	5	4	5	4	23
Asian	110	93	70	77	76	426
Other	51	45	27	26	23	172
Unkown/missing	7	6	18	10	7	48
Total	881	921	752	750	701	4,005

¹ Excludes 44 cases for which industry data were not available.

percent of the victims were white, 20 percent were black, and 16 percent were of other races. (See table 1). The number of occupational firearm homicides decreased by approximately 20 percent over the 5-year period examined in this study, with the greatest decline occurring in the "other" category. White victims, who accounted for the majority of the deaths, experienced an approximately 18-percent decrease in occupational firearm homicides over the study period.

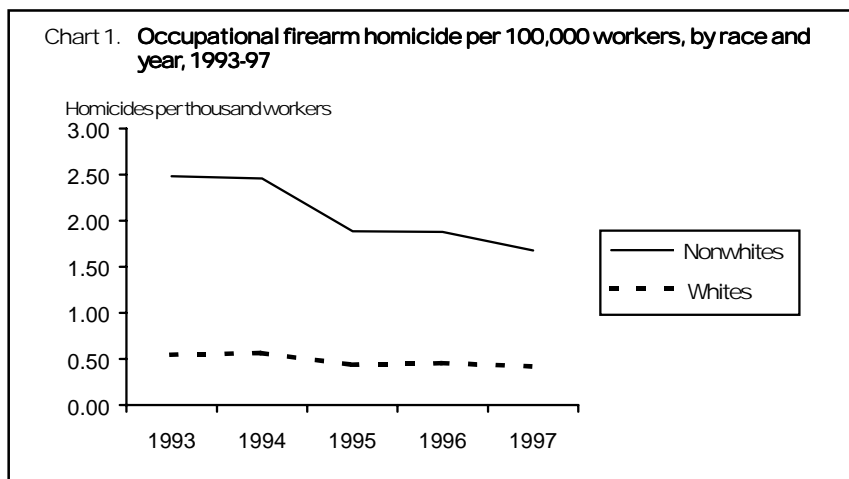
Homicides by industry. Approximately 48 percent of the occupational firearm fatalities occurred in the retail trade industry, which accounted for the greatest percentage of homicides. The transportation and retail trade industries, combined, accounted for approximately 61 percent of occupational firearm homicides. The summary of fatalities by industry is displayed in table 2.

Homicide rates. The person-years of exposure were obtained from BLS for

Table 2. Frequency and percent distribution of occupational firearm homicides by industry, 1993-97

Industry	Frequency	Percentage
Agriculture	64	1.60
Mining	6	.15
Construction	56	1.40
Manufacturing	163	4.07
Transportation	492	12.28
Wholesale trade	92	2.30
Retail trade	1,946	48.59
Finance	129	3.22
Services	669	16.70
Public administration	388	9.69
Total ¹	4,005	100.00

¹ Excludes 44 cases for which industry data were not available.



the 5-year period covered in this analysis. The occupational firearm homicide rates were then calculated by year for white workers and for nonwhite workers. For each year in this analysis, nonwhite workers experienced much higher homicide rates than did white workers. (See chart 1.) The homicide rate for white workers decreased from 0.55 homicides per 100,000 person-years of exposure in 1993 to 0.42 in 1997. Nonwhite homicide rate decreased from 1.94 homicides per 100,000 person-years of exposure in 1993 to 1.26 in 1997. Homicide rates decreased 24 percent for white workers and 35 percent for nonwhite workers over this period. Despite these rate decreases, occupational firearm fatality rates were still approximately 3 times greater for nonwhite than for white workers.

Relative risks. Using BLS employment data, relative risks based upon person-years of exposure were calculated for occupational firearm homicides by comparing the incidence rates of white workers with those of nonwhite work-

ers. Comparisons were made for all industry groups. In 8 of 10 industries, nonwhite workers had a significantly greater risk for occupational firearm homicide than did white workers. (See table 3).

For each industry, the fatality rates for white workers and nonwhite workers were calculated, along with the relative risks and 95-percent confidence intervals. Relative risk was considered to be significant at the $p < 0.05$ level if the confidence interval range did not include 1.00. Nonwhite workers were identified as having a significantly greater risk for occupational firearm homicides in all industry groups except for mining and the public sector.

Nonwhite workers in agriculture, retail trade, and transportation experienced the greatest risk of occupational firearm homicide. Nonwhite workers in these industry groups had a risk of firearm homicide more than 4 times that of white workers employed in the same industry. Differences in firearm homicide rates existed between industries and between races within industries.

Table 3. Relative risks for white workers and nonwhite workers by industry, 1993-97

Industry	Incidence rate (per 100,000 person years of exposure)	Relative risk	95-percent confidence interval
Agriculture	Whiteworkers .32	4.14	(2.37,7.62) ¹
	Nonwhiteworkers 1.32		
Mining	Whiteworkers .20	0	
	Nonwhiteworkers 0		
Construction	Whiteworkers .13	2.61	(1.50,5.26) ¹
	Nonwhiteworkers .34		
Manufacturing	Whiteworkers .12	3.35	(2.44,4.60) ¹
	Nonwhiteworkers .40		
Transportation	Whiteworkers .66	4.83	(4.05,5.76) ¹
	Nonwhiteworkers 3.21		
Wholesale trade	Whiteworkers .32	2.84	(1.76,4.56) ¹
	Nonwhiteworkers .90		
Retail trade	Whiteworkers 1.29	4.12	(3.76,4.51) ¹
	Nonwhiteworkers 5.29		
Finance	Whiteworkers .28	2.23	(1.52,3.36) ¹
	Nonwhiteworkers .62		
Services	Whiteworkers .25	2.31	(1.96,2.72) ¹
	Nonwhiteworkers .57		
Publicadministration	Whiteworkers 1.37	.88	(.50,1.99)
	Nonwhiteworkers 1.21		

The public administration industry had the highest firearm homicide death rate for white workers, with 1.37 deaths per 100,000 person-years, while the retail trade industry had the highest firearm homicide death rate for nonwhite workers, with 5.29 deaths per 100,000 person-years of exposure. In the transportation industry more than in any other, nonwhite workers had a greater relative risk for occupational firearm fatality compared with white workers, an indication that a disproportionate level of risk by race exists among workers employed in that industry.

Conclusion

Part of the explanation for disproportionate risk by race of occupational firearm homicide may be found in differ-

ences in environmental factors or in job task assignments that were not captured in the fatality data. One factor may be a disproportionate number of nonwhite workers working in high crime areas or during high crime periods, such as late night shifts.

This study, like others before it, has confirmed the fact that robbery is the primary motive, and the handgun is the principal weapon used, in workplace homicides. In many industries, crime-prevention strategies include training workers and incorporating protective measures to reduce the potential for being victim of a crime. In transportation, for example, commonly used measures include the installation of bullet-proof glass between driver and passenger, providing radio communi-

cation between driver and dispatcher, installing a safe in the vehicle, and crime prevention training for drivers. In retail trade, prevention strategies include re-design of the store to place a barrier between worker and customer, video surveillance systems, drop safes, and panic buttons that can be used to notify police. The State of Washington, for example, has implemented a crime-prevention training program for retail store owners that has been effective in reducing the incidence of workplace deaths in that industry. Despite these and similar measures, however, a study of relative risk reveals that nonwhite workers in most industries still have a greater risk of falling victim to occupational homicide by firearm than do white workers. ■

¹ See *Fatal Workplace Injuries in 1995: A Collection of Data and Analysis*, Report 913 (Bureau of Labor Statistics, 1997), p. 26; *Fatal Workplace Injuries in 1996: A Collection of Data and Analysis*, Report 922 (Bureau of Labor Statistics, 1998), p. 56; and *Fatal Workplace Injuries in 1997: A Collection of Data and Analysis*, Report 934 (Bureau of Labor Statistics, 1999), p. 4.

² Guy A. Warchol, *Bureau of Justice Statistics Special Report: Workplace Violence: 1992-96* (Bureau of Justice Statistics, 1998), pp. 1-9.

³ Guy A. Toscano, "Workplace violence: An analysis of Bureau of Labor Statistics data," *Occupational Medicine*, vol. 11, no. 2, pp. 227-35.

⁴ Guy A. Toscano and Janice A. Windau, "Profiles of Fatal Work Injuries in 1996," *Compensation and Working Conditions*, spring 1998, pp. 37-45.

⁵ Centers for Disease Control and Prevention, "Nonfatal and Fatal Firearm-related Injuries—United States, 1993-1997," *Morbidity and Mortality Weekly Report*, vol. 48, no. 45, pp. 1029-34.

⁶ See *National Census of Fatal Occupational Injuries, 1999*, USDL 00-236 (Bureau of Labor Statistics, 2000).

⁷ Warchol, *Bureau of Justice Statistics Special Report*, pp. 1-9; Centers for Disease Control and Prevention, *Fatal Injuries to Workers in the United States, 1980-1989: A*

Decade of Surveillance (Washington, U.S. Government Printing Office, August 1993), p.10; and Dawn N. Castillo and E. Lynn Jenkins, "Industries and occupations at high risk for work-related homicide," *Journal of Medicine*, February 1994, pp. 125-32.

⁸ Toscano, "Workplace violence," pp. 227-35.

⁹ Toscano and Windau, "Profiles," pp. 37-45; and Eric F. Sygnatur and Guy A. Toscano, "Work-related Homicides: The Facts," *Compensation and Working Conditions*, spring 2000, pp. 3-8.

¹⁰ Ronet Bachman, *United States Department of Justice Crime Data Report: Violence and Theft in the Workplace* (Bureau of Justice Statistics, 1994), pp. 1-2.

¹¹ Toscano and Windau, "Profiles," pp. 37-45.

¹² Castillo and Jenkins, "Industries," pp. 125-32.

¹³ Marianne W. Zawitz, *Bureau of Justice Statistics Selected Findings: Guns Used in Crime* (Bureau of Justice Statistics, 1995), pp. 1-7.

¹⁴ Castillo and Jenkins, "Industries," pp. 125-32.

¹⁵ Dana Loomis and David Richardson, "Race and the risk of fatal injury at work," *American Journal of Public Health*, January 1998, pp. 40-44.

¹⁶ *National Census of Fatal Occupational*

Injuries, 1999.

¹⁷ Castillo and Jenkins, "Industries," pp. 125-32.

¹⁸ Toscano and Windau, "Violence in the Workplace," *Compensation and Working Conditions*, Spring 1995, pp. 43-49.

¹⁹ Toscano, "Workplace violence," pp. 227-35.

²⁰ Rosemary J. Erickson, "Retail employees as a group at risk for violence," *Occupational Medicine*, vol. 11, no. 2, pp. 269-76.

²¹ Toscano and Windau, "Profiles," pp. 37-45; Loomis and Richardson, "Race," pp. 40-44; Jess F. Kraus and David L. McArthur, "Epidemiology of violent injury in the workplace," *Occupational Medicine*, vol. 11, no. 2, pp. 201-17; and Zawitz, "Bureau of Justice Statistics Selected Findings," pp. 1-7.

²² Kraus and McArthur, "Epidemiology," pp. 201-17.

²³ Toscano and Windau, "Profiles," pp. 37-45.

²⁴ *Census of Fatal Occupational Injuries: CFOI Research File User Reference* (Bureau of Labor Statistics, 1997).

²⁵ U.S. Office of Management and Budget, *Standard Industrial Classification Manual* (Washington, U.S. Government Printing Office, 1987).

²⁶ Abraham M. Lilienfeld and David E. Lilienfeld, *Foundations in Epidemiology* (New York, Oxford University Press, 1980).