# Workplace Homicides of Texas Males

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**Abstract:** A review of Texas death certificates for 1975–84 identified 779 civilian males whose deaths were homicides that occurred in the workplace. Injuries from firearms caused 81 per cent of the deaths. The overall rate of workplace homicide was 2.1/100,000 male workers/year. Males employed in taxicab service had the highest rate of workplace homicide, 78.2/100,000 male workers/year. Males employed in certain retail trade industries, law enforcement, and the private-security industry also had high rates of workplace homicide. Male workers ≥65 years old were at especially high risk, with a workplace-homicide rate 3.5 times that of younger workers. A review of medical examiners' records in five urban counties indicated that 32 per cent of victims who had worked in eating-and-drinking places and 5 per cent of other workers had blood or cerebrospinal-fluid alcohol levels ≥0.10 g/dl. These results provide a base for designing effective strategies to prevent workplace homicides. (*Am J Public Health* 1987; 77:1290–1293.)

## Introduction

Homicide ranks as one of the leading types of fatal occupational injuries in the United States, accounting for the deaths of an estimated 800 to 1,400 American workers each year.[1,2] Despite the toll that workplace homicides take, few epidemiologic descriptions of this public health problem exist. A study of fatal occupational injuries among all Maryland workers[3] described 16 persons (all males) who died of gunshot wounds, and a study of fatal occupational injuries of Texas women* also provided information on workplace homicides.

In 1980, males comprised 57 per cent of the American workforce and were more likely than females to work in certain industries and occupations (agriculture, mining, construction, and transportation) and less likely than females to work in others (retail trade, personal services, and professional and related services).[4] The risks of workplace homicide that male and female workers face, therefore, might be expected to differ.

This report describes the occupations and industries that present the highest risk of homicide of Texas males. For those workplace homicides that occurred in five urban counties, the report describes the circumstances under which the homicides occurred.

## Methods

Texas death certificates for 1975 through 1984 were reviewed. A case was defined as the death of a male, 16 years of age or older, who was injured and died in Texas, whose death certificate had a positive response to "injury at work?", whose underlying cause of death was coded to "homicide" according to the International Classification of Diseases (ICD Codes E960–E969, 8th[5] and 9th[6] revisions), and who died in the period 1975 through 1984. Deaths were included regardless of the residences listed on the death certificates, and regardless of the intervals from injury to death. Deaths of students and military personnel were excluded. In Texas, medical examiners or coroners complete the injury-at-work and cause-of-death portions of death certificates of all persons whose deaths were homicides, suicides, or from other injuries.

Texas death-certificate information on usual occupation and kind of business or industry was coded to the 1980 census occupation and industry classification system[7] at the Texas Department of Health by a person trained at the National Institute for Occupational Safety and Health. The 1980 census industry classification system classifies businesses into 13 large groups (e.g., retail trade, entertainment and recreation services, public administration); these groups are referred to here as major industries. Within these groups, businesses are further classified into subgroups (e.g., gasoline service stations, food-bakery-and-dairy stores, taxicab service); these subgroups are referred to here as subindustries. The term industry is used here as a generic term and refers to major industries and subindustries.

Occupation-specific, industry-specific, age-specific, and race-specific fatal-injury rates were determined using Bureau of the Census 1980 estimates of the employed civilian labor force in Texas for males 16 years of age or older.[8] Data on Spanish origin of cases were available only on persons who died in 1980 through 1984. The rates specific to Spanish origin are average annual rates for 1980 through 1984. All other rates are average annual rates for 1975 through 1984.

Medical examiners' records were reviewed for the cases identified in the death-certificate review who had died in 1975 through 1984 in five urban counties: Harris, Dallas, Tarrant, Bexar, or Travis Counties. These counties contain the cities of Houston, Dallas, Fort Worth, San Antonio, and Austin, respectively. Data obtained from these records included the activity in which the person was engaged when he was injured, the relationship between the offender and victim, whether the homicide had occurred during a robbery, the type of weapon used, and blood and cerebrospinal-fluid alcohol levels for homicides in which the interval from injury to death was ≤4 hours. To use medical examiners' data to verify whether a homicide had occurred in a workplace, a workplace was defined as any location where a person was at work, either employed by others or self-employed.

Years of potential life lost was defined as the number of years of potential life lost by each death occurring before a predetermined end point, set at age 65 years.[9]

Within a category (e.g., race), a rate ratio was calculated by using as a reference the rate of the group with the lowest rate. For all rate ratios, 95 per cent confidence intervals were calculated.[10]

*Davis H, Honchar PA, Suarez L: Fatal occupational injuries of women, Texas, 1975–84, accepted for publication in this Journal this winter.

## Results

The review of death certificates identified 779 males who met the case definition; 759 were Texas residents. The median age of the victims at death was 40 years, with a range of 16 to 89 years. These deaths resulted in the premature loss of 18,336 potential years of life.

Injuries from firearms caused 630 (81 per cent) of the homicides; 86 (11 per cent) were caused from cutting or piercing instruments, and 63 (8 per cent) from other means.

The overall workplace-homicide rate was 2.1/100,000 male workers/year. Of the 12 major industries with 10 or more workplace homicides (Table 1), the retail trade industry had the highest workplace-homicide rate, 6.2/100,000 male workers/year. Three retail-trade subindustries had especially high workplace-homicide rates: gasoline service stations (14.2/100,000 male workers/year), food-bakery-and-dairy stores (11.9/100,000 male workers/year), and eating-and-drinking places (7.0/100,000 male workers/year).

Of the subindustries with 10 or more workplace homicides, taxicab service had the highest workplace-homicide rate, 78.2/100,000 male workers/year. Other subindustries that had particularly high workplace-homicide rates were justice, public order, and safety (12.4/100,000 male workers/year); detective and protective services (10.4/100,000 male workers/year); and hotels, motels, and lodging places (7.5/100,000 male workers/year).

Of the occupations (Table 2), two closely associated with law enforcement had especially high workplace-homicide rates: sheriffs and bailiffs (44.4/100,000 male workers/year); and police and detectives in public service (25.7/100,000 male workers/year). Taxicab drivers and chauffeurs, supervisors

and proprietors (sales occupations), garage and service station-related occupations, stock handlers and baggers, and guards and police not in public service also had high workplace-homicide rates.

All of the 40 murdered stock handlers and baggers were grocery clerks. Of the 144 murdered supervisors and proprietors (sales occupations), 56 (39 per cent) worked in food-bakery-and-dairy stores, and 20 (14 per cent) in gasoline service stations. Of the 87 murdered managers and administrators, 50 (57 per cent) worked in eating-and-drinking places.

Using the age groups listed in Table 3, data analysis revealed a trend toward higher rates of workplace homicides with increasing age, with males ≥65 years old having a workplace-homicide rate 3.5 times that of males <65 years old (95% CI 2.8, 4.3). Forty-one of the homicides (46 per cent) in this older age group occurred to males employed in retail trade.

White males (633 deaths) had the lowest workplace-homicide rate, 2.1/100,000 male workers/year; Black males' (117 deaths) rate was 3.4/100,000 male workers/year (rate ratio 1.7, 95% CI 1.4, 2.0), and males of other races (29 deaths) had a rate of 6.2/100,000 male workers/year (rate ratio 3.0, 95% CI 2.1, 4.3). Males of Spanish origin (90 deaths) had a workplace-homicide rate of 2.7/100,000 male workers/year, 1.3 times that of other males (305 deaths), 95% CI 1.0, 1.7. These differences are unlikely to be due to differences in age distribution. Workers ≥65 years old did not comprise >12

**TABLE 1—Workplace Homicide Rates for Major Industries and Subindustries, Males, 16 Years Old or Older, Texas, 1975–84**

| Industry or Type of Business* | No. of Workplace Homicides | 1980 Texas Population at Risk | Workplace Homicide Rate/ 100,000/Year |
|---|---|---|---|
| Retail trade | 317 | 511,094 | 6.2 |
| Gasoline service stations | 45 | 31,677 | 14.2 |
| Food, bakery, and dairy stores | 109 | 91,927 | 11.9 |
| Eating and drinking places | 70 | 99,373 | 7.0 |
| Entertainment and recreation services | 15 | 29,359 | 5.1 |
| Public administration | 79 | 170,663 | 4.6 |
| Justice, public order, and safety | 73 | 58,848 | 12.4 |
| Personal services | 23 | 54,076 | 4.3 |
| Hotels, motels, and lodging places | 15 | 19,932 | 7.5 |
| Business and repair services | 61 | 198,234 | 3.1 |
| Detective and protective services | 12 | 11,582 | 10.4 |
| Automotive repair and services | 22 | 61,926 | 3.6 |
| Transportation, communications, and other public utilities | 72 | 356,108 | 2.0 |
| Taxicab service | 28 | 3,581 | 78.2 |
| Trucking service and warehousing | 16 | 96,727 | 1.7 |
| Construction | 71 | 497,498 | 1.4 |
| Finance, insurance and real estate | 19 | 150,456 | 1.3 |
| Real estate, including real estate-insurance law offices | 12 | 50,447 | 2.4 |
| Agriculture, forestry, and fisheries | 16 | 158,859 | 1.0 |
| Professional and related services | 30 | 374,541 | 0.8 |
| Wholesale trade | 12 | 243,248 | 0.5 |
| Manufacturing | 28 | 794,581 | 0.4 |
| All industries | 779 | 3,705,550 | 2.1 |

*Only major industries and subindustries with 10 or more deaths are included. Only subindustries with above-average risk are included. Industry was not codable for 30 cases.

**TABLE 2—Workplace Homicide Rates for the Occupations with Above-Average Risk, Males, 16 Years Old or Older, Texas, 1975–84**

| Occupation* | No. of Workplace Homicides | 1980 Texas Population at Risk | Workplace Homicide Rate/ 100,000/Year |
|---|---|---|---|
| Sheriffs, bailiffs, and other law-enforcement officers | 14 | 3,153 | 44.4 |
| Taxicab drivers and chauffeurs | 30 | 8,124 | 36.9 |
| Police and detectives, public service | 55 | 21,430 | 25.7 |
| Supervisors and proprietors, sales | 144 | 90,618 | 15.9 |
| Garage and service station related | 20 | 17,561 | 11.4 |
| Guards and police, not public service | 27 | 24,607 | 11.0 |
| Stock handlers and baggers | 40 | 36,522 | 11.0 |
| Construction laborers | 31 | 60,247 | 5.1 |
| Managers and administrators | 87 | 232,420 | 3.7 |
| All occupations | 779 | 3,705,550 | 2.1 |

*Only occupations with 10 or more deaths are included. Occupation was not codable for 26 cases.

**TABLE 3—Rates of Workplace Homicides, by Age, Males, 16 Years Old or Older, Texas, 1975–84**

| Age Group (years) | No. of Workplace Homicides | 1980 Texas Population at Risk | Workplace Homicide Rate/ 100,000/Year |
|---|---|---|---|
| 16–19 | 25 | 261,999 | 1.0 |
| 20–24 | 74 | 535,663 | 1.4 |
| 25–29 | 112 | 568,491 | 2.0 |
| 30–34 | 97 | 508,674 | 1.9 |
| 35–44 | 157 | 717,956 | 2.2 |
| 45–54 | 129 | 581,083 | 2.2 |
| 55–59 | 53 | 242,049 | 2.2 |
| 60–64 | 43 | 156,511 | 2.8 |
| ≥65 | 89 | 133,124 | 6.7 |
| All ages | 779 | 3,705,550 | 2.1 |

per cent of the workplace homicides in any racial or ethnic group.

Male workers in Standard Metropolitan Statistical Areas (SMSAs) with a population >500,000 had a workplace-homicide rate of 2.5/100,000, 1.5 times that of male workers in other areas (1.6/100,000), 95% CI 1.3, 1.8. Stratification by industry type and SMSA status (Table 4) revealed that male workers of other races who worked in retail trade industries in SMSAs of >500,000 persons had the highest workplace-homicide rate, 41.8/100,000 male workers/year. All 26 deaths in this group occurred to males of Asian race, 10 of whom had been born in Vietnam. Fifteen of these deaths occurred to foreign-born males working in food-bakery-and-dairy stores in Harris County.

For 631 workplace homicides, the workshift in which the injury occurred could be determined. Two hundred fifty-five (40 per cent) of these injuries occurred between 4:00 pm and midnight; 200 (32 per cent) occurred between midnight and 8:00 am. The injuries occurred Monday through Friday in 551 (71 per cent) of 771 workplace homicides for whom such a determination could be made. No seasonal pattern was apparent for the workplace homicides.

An approximate interval from injury to death could be determined for 770 males. Six hundred ninety-three (90 per cent) of them died within 24 hours of the time of injury.

Medical examiners' records were available for review for 473 of the 488 males who died in Harris, Dallas, Tarrant, Bexar, or Travis Counties and whose deaths met the case definition. A review of these records confirmed that 450 (95 per cent) of the homicides had occurred in the workplace; for 17 deaths (4 per cent), insufficient information was available to make such a determination; and for six deaths (1 per cent), the review indicated the homicide had not occurred in the workplace. Only homicides that were confirmed as having occurred in the workplace were included in the analyses that follow.

Of the 450 confirmed workplace homicides, 215 (48 per cent) occurred during robberies, 45 (10 per cent) during arguments between victims and customers, 95 (21 per cent) under other known circumstances, and 95 (21 per cent) under unknown circumstances. The offenders were either of unknown relationships or strangers to the victims in 344 (76 per cent) of the homicides; customers in 47 homicides (11 per cent); co-workers in 45 homicides (10 per cent); spouses or other intimate acquaintances in five homicides (1 per cent); other non-family acquaintances in five homicides (1 per cent); and other family members in four homicides (1 per cent).

Injuries from firearms caused 379 (84 per cent) of the confirmed workplace homicides. For 184 firearm-related deaths, the type of weapon used could be determined; injuries from handguns caused 156 (85 per cent) of these homicides, followed by injuries from shotguns (19 homicides, 10 per cent), and rifles (nine homicides, 5 per cent).

Blood or cerebrospinal-fluid alcohol levels were available for 370 of the 386 confirmed workplace homicides in which in the interval from injury to death was ≤4 hours. Thirty-four (9 per cent) of 370 males had blood or cerebro-spinal-fluid alcohol levels between 0.01 and 0.09 g/dl; 14 males (4 per cent) had levels between 0.10 and 0.19 g/dl; and 21 males (6 per cent) had levels ≥0.20 g/dl. Workplace-homicide victims who had been employed in eating-and-drinking places had an especially high frequency of blood or cerebrospinal-fluid alcohol levels ≥0.10 g/dl. Of 62 such males tested, seven (11 per cent) had levels between 0.10 and 0.19 g/dl, and 13 (21 per cent) had levels ≥0.20 g/dl.

## Discussion

This study identifies several categories within which the risk of workplace homicides of Texas males varies among groups: occupation, type of industry, age, race, ethnicity, and SMSA status. Taxicab drivers, law-enforcement officers, private-security personnel, and persons employed in certain retail trade industries or in lodging places had the highest rates of workplace homicide, reflecting the current high risk to persons who provide public or private security or whose work involves the exchange of money in public, unsecured places.

The high rate of workplace homicides for males ≥65 years old does not result from a larger proportion of older males having been employed in the retail trade industry. In Texas in 1980, 16 per cent of working males ≥65 years old were employed in retail trade, compared to 14 per cent of working males <65 years old.[8] Perpetrators of violent crimes might have viewed the older males as being especially vulnerable targets. Another possible explanation is that older males might have been less likely than younger males to survive their injuries. It is probably not due to under-enumeration in the census of employed males ≥65 years old. The 1980 census estimate for employed Texas males ≥65 years old was based on a survey of 19 per cent of all housing units, with 95 per cent of the data obtained by a mailout/mailback procedure.[11] An estimate from the 1980 Current Population Surveys, based on monthly interviews with persons from approximately 60,000 households nationwide, was 6 per cent higher than the census estimate.[12]

The high workplace-homicide rates of Black and other-race male workers suggest that persons who are socioeconomically and/or educationally disadvantaged might be obliged more frequently to seek employment in settings that

**TABLE 4—Rates of Workplace Homicides, by Race, Industry and SMSA Status, Males, 16 Years Old or Older, Texas, 1975–84**

| Group | No. of Workplace Homicides | 1980 Texas Population at Risk[a-d] | Workplace Homicide Rate/ 100,000/Year |
|---|---|---|---|
| **Retail Trade Industry** | | | |
| **SMSAs >500,000 persons** | | | |
| White | 177 | 235,687 | 7.5 |
| Black | 23 | 32,418 | 7.1 |
| Other | 26 | 6,218 | 41.8 |
| Total | 226 | 292,613 | 7.7 |
| **Other areas** | | | |
| White | 82 | 187,970 | 4.4 |
| Black | 9 | 12,987 | 6.9 |
| Other | 0 | 1,626 | 0.0 |
| Total | 91 | 218,481 | 4.2 |
| **Non-retail Trade Industry** | | | |
| **SMSAs >500,000 persons** | | | |
| White | 236 | 1,461,775 | 1.6 |
| Black | 53 | 199,065 | 2.7 |
| Other | 3 | 28,630 | 1.0 |
| Total | 292 | 1,800,478 | 1.6 |
| **Other areas** | | | |
| White | 138 | 1,186,578 | 1.2 |
| Black | 32 | 96,279 | 3.3 |
| Other | 0 | 10,569 | 0.0 |
| Total | 170 | 1,393,978 | 1.2 |

[a]Race is not known for 18,290 male workers in retail trade in SMSAs >500,000 persons.
[b]Race is not known for 15,898 male workers in retail trade in other areas.
[c]Race is not known for 111,008 male workers in non-retail trade industries in SMSAs >500,000 persons.
[d]Race is not known for 100,552 male workers in non-retail trade industries in other areas.

pose relatively high risks of violent injury. In Texas in 1980, 3.8 per cent of Black male workers were employed in eating-and-drinking places, compared to 2.4 per cent of White male workers,[8] and 4.2 per cent of other-race male workers were employed in food-bakery-and-dairy stores, compared to 2.4 per cent of White male workers.[8]

Other factors might also have contributed to the racial disparities in the risk of these homicides. Larger proportions of Black and other-race male workers might have been employed in neighborhoods or during workshifts with higher workplace-homicide rates. Although workshift-specific rates could not be calculated, the finding that 32 per cent of workplace homicides occurred between midnight and 8:00 am (when relatively few persons were at work) suggests that employment during the night shift presented an above-average risk of workplace homicide. Part of the increased workplace-homicide rates of Black and other-race male workers might be due to persons in these groups having been underrepresented in the census data used to calculate the rates. Because of considerable immigration into Texas since 1980 of persons born in Southeast Asia (Centers for Disease Control: unpublished data), this might especially be a factor for other-race male workers, 10 of whom were born in Vietnam. However, even if the deaths of males from Southeast Asia were excluded, the workplace-homicide rate of other-race male workers would be twice that of White male workers.

Alcohol intoxication of workers might have had a role in at least 35 of the workplace homicides. The frequency of blood or cerebrospinal-fluid alcohol levels $\geq 0.10$ g/dl varied with the industry. Such alcohol levels were detected in 32 per cent of the males who had worked in eating-and-drinking places, died within four hours of injury, and had such a test performed. By contrast, these alcohol levels were found in only 5 per cent of the males who had worked in other industries.

Using data from a study on all fatal occupational injuries in Maryland in 1978,** and Bureau of the Census estimates for males employed in Maryland in 1980,[13] I calculated workplace-homicide rates for Maryland males. The overall rate of workplace homicide of males was 1.6/100,000 male workers/year. The subindustries and occupations in Maryland that had the highest rates of workplace homicide were taxicab service (102.4/100,000 male workers/year), police and detectives in public service (23.0/100,000 male workers/year), gasoline service stations (19.1/100,000 male workers/year), and food-bakery-and-dairy stores (10.9/100,000 male workers/year). These Maryland subindustries, occupations, and rates are similar to those found in the current study in Texas, suggesting that in many states, the same subindustries and occupations might present the highest risks of workplace homicides of male workers.

Efficient prevention of workplace homicides requires that research and intervention be targeted to the workers at highest risk. Employees in food-bakery-and-dairy stores are one such group. A study has demonstrated that the number of robberies in convenience stores can be reduced by: making the cash register area more visible from the street; keeping as

little money as possible in the cash register and making that known; the use of a drop safe into which, at night, all bills of value greater than $1 are placed; and keeping the store clean.[14] Because many workplace homicides occur during robberies, a reduction in the number of workplace homicides might accompany an effective program of robbery deterrence.

Bulletproof barriers between the driver and passenger compartments in taxicabs, enclosed cashier booths in gasoline service stations, and protective vests for law-enforcement officers and private-security personnel are other possible techniques to prevent workplace homicides. However, the extent to which these techniques are already practiced and their efficacy at preventing these homicides is unknown. The effectiveness of handgun-control laws in preventing such deaths is also unknown. Studies that address these issues would seem an appropriate next step in efforts to reduce the toll exacted by workplace homicides.

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