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Fatal Occupational Injuries Among Self-Employed Workers in North Carolina

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Abstract

Background—Research suggests that rates of occupational injury and death may be higher among self-employed workers than in the wage and salaried population. This analysis was conducted to describe the demographic and occupational characteristics, as well as injuries, activities, and occupations of self-employed workers who are fatally injured on the job.

Methods—Characteristics of workers by type of employment were compared using data from the North Carolina Office of the Chief Medical Examiner, 1978–1994. Age-, activity-, and industry-specific fatality rates in self-employed workers (N = 395) were contrasted to those privately employed (N = 1,654).

Results—Highest fatal injury rates among the self-employed occurred in agriculture, retail, and transportation industries. Homicide deaths occurred more frequently among self-employed workers; deaths resulting from unintentional injuries occurred more frequently among non-self-employed workers.

Conclusions—Elevated occupational fatality death rates among self-employed workers, especially in retail and transportation industries, provide justification for addressing work-related conditions of self-employed workers in North Carolina.

Keywords

accidents; occupational; employment status; mortality; surveillance; work; wounds and injuries

INTRODUCTION

People opt to become self-employed to work flexible hours, to convert a hobby into an income, and to work from home or during retirement. Others are forced into self-employment to supplement their earnings through the loss of a job or while looking for a traditional or more stable job. For those choosing self-employment, one notable advantage is the responsibility for supervising oneself instead of being supervised by a boss or manager. The lack of oversight and increased autonomy among self-employed workers has at least one important drawback: while Federal and local regulations protect wage and salary

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workers, safety training, workplace hazards, and the use of appropriate personal protective equipment among self-employed workers are unregulated and undocumented. Despite these concerns, sparse literature exists describing the injuries sustained by self-employed workers while working in unregulated work places. A reasonable explanation for the paucity of literature is the lack of reliable information about the status and working conditions of this population. Important surveillance systems such as death certificates and hospital discharge reports do not routinely indicate employment status, and self-employed individuals are difficult to identify and include in many other established injury surveillance systems. Surveillance systems for reporting occupational health practices and injuries are typically instituted by companies, industries, and/or unions; if self-employed workers are not formally affiliated with these, or other organizations collecting occupational safety data, any injuries sustained while working are unlikely to be detected.

Previous surveillance of occupational injury deaths indicates that the rates of fatal injuries vary by work status, with self-employed workers experiencing higher rates of fatal injury [Feyer et al., 2001]; among self-employed workers, rates vary by industry, particularly between construction and non-construction trades [Pollack et al., 1996]. Disparities in safety training, personal protective equipment, and work processes, as well as differences in ages and levels of work experience of the self-employed and employee population may account for the high work-related fatal injury rates. Insufficient knowledge about these hypothesized differences indicates important occupational health research and practice needs that cannot be addressed without preliminary information concerning the demographic and occupational characteristics of the individuals who are fatally injured while working. This research was initiated to identify characteristics of self-employed individuals in North Carolina whose deaths are attributed to occupational injuries. The information generated through this analysis provides useful and detailed descriptive data about fatal injuries identified in a small, but growing, portion of North Carolina's workforce.

MATERIALS AND METHODS

Study Design and Data Source

Data for this study were obtained from the North Carolina Office of the Chief Medical Examiner's database of deaths occurring in North Carolina. Throughout North Carolina, medical examiners routinely investigate all deaths resulting from suspicious, unusual, or unnatural circumstances. During a death investigation, medical examiners and coroners record demographic information about the decedent, causes of death determined by autopsy or investigation, means and manner of death, and unusual circumstances identified, such as whether the decedent was in prison, in air-, or water-craft, or at work at the time of fatal injury or death. Medical examiners throughout North Carolina report all investigated deaths to a central office where files are coded, computerized, and stored [Loomis et al., 1997].

The data for this analysis were identified and collected for a previous study of fatal occupational injuries in North Carolina. The parent study included homicide deaths and fatal unintentional injuries occurring on-the-job in North Carolina, and investigated by the medical examiner or coroner between January 1, 1978 and December 31, 1994. Deaths resulting from injuries sustained outside North Carolina, deaths occurring at the workplace

but attributed to non-occupational factors, and deaths occurring longer than 30 days after the injury were excluded from the dataset [Loomis et al., 1997; Rodriguez-Acosta et al., 1999]. Deaths attributed to unintentional poisoning by alcohol and medications were excluded from the dataset, however, toxicological data, including blood alcohol concentration, were available for individuals whose deaths were not attributed to alcohol or drug overdose. The analysis presented here is based on information of about 2,884 fatal occupational injuries reviewed for the parent study [Loomis et al., 1997].

For each death, study personnel manually reviewed the circumstances of the death as described by the death certificate and medical examiner's classification of work-relatedness. The detailed review of each fatality enabled investigators to code the industry and occupation at the time of each occupational injury to the classification system used by the US Bureau of the Census in 1990 [Bureau of the Census, U.S. Department of Commerce, 1992]. The review included using an additional set of criteria summarizing the likelihood of the fatal injury having occurred on-the-job. Three sources were considered to determine whether the fatal injury occurred while the decedent was working. In North Carolina, death certificates may be marked as "injury at work" and/or the medical examiner's report may indicate that the death was due to an injury "on-the-job." To standardize the definition of work-relatedness, reviewers assessed each record, including the work-related flags on the medical examiner's report and death certificate, and classified each injury as having occurred definitely at work, definitely not at work, probably at work, probably not at work, or as having insufficient information to determine whether the injury occurred at work. Investigators reviewed deaths for which the reviewer was unable to make a decision about the work-relatedness of the injury. This analysis is restricted to fatal injuries considered, upon review by study personnel, to be "definitely work related" (n = 2,738); there were no decedents whose injuries were classified as "probably at work."

The analyses included data directly extracted from the medical examiners' reports and classifications generated during manual review of the reports. Self-employment status was determined using a 'class of work' variable created using information in the medical examiners' reports. If medical examiners' reports indicated that an occupational fatality occurred while the decedent was working for him/herself in either a formal or informal working arrangement, the worker was classified as self-employed. If no explicit indication of self-employment was found, the decedent was not considered self-employed. Class-of-work categories include government, working without pay in family business, military, private employee, self-employed, and volunteer. To compare rates of fatal injuries, worker categories for which estimates of worker-years are unavailable were excluded, therefore, fatality rates are compared for self-employed, government, and private employees.

Statistical Analyses

All decedents classified as self-employed (n = 395) were compared to decedents classified as government employees (n = 184) and privately employed workers (n = 1,654) for differences in demographic characteristics, including age, race, and sex; and to privately employed workers for differences in work-related factors such as industry, occupation, activity at time of death, and circumstances of the injuries and deaths. Circumstances of

injury and death include the means and manner of death, location of injury and death, and blood alcohol levels measured during the medical examiner or coroner's investigation of each fatality. Fatality rates were calculated using 1980 and 1990 US Census data for North Carolina. A linear model was used to estimate the number of workers in North Carolina for each year between 1978 and 1994 [Loomis et al., 1997]. Age-adjusted fatality rates were calculated for self-employed, government, and private workers using direct standardization with the working population of North Carolina as the standard population. When calculating fatality rates, decedents aged 17 and younger were excluded. Rate ratios and 95% confidence intervals were calculated to estimate the ratio of the fatality rate among self-employed workers in cause of death, activity, means of death, and industry categories, to the rate among privately employed workers in each category.

RESULTS

Three hundred ninety five ($n = 395$; 14.4%) occupationally injured decedents were identified as self-employed; the remaining decedents were government workers ($n = 184$; 6.7%), privately employed ($n = 1,654$; 60.4%), military ($n = 154$; 5.6%), or other workers ($n = 351$; 12.8%), including volunteers, those working without pay in family business, and decedents whose classification is unknown. Decedents identified as self-employed were older than government and privately employed workers (mean age: 53 vs. 39 and 38 years, respectively), with over 25% of the self-employed worker fatalities occurring among workers aged 65 and older ($n = 100$). The majority of occupational injury deaths in self-employed, government, and privately employed workers occurred among white workers, however, the proportion of white workers was also higher among the self-employed (85.6 vs. 75.5 and 72.9%, respectively). Nearly all occupational injury fatalities identified were among men (Table I).

From 1978 to 1990, crude death rates (deaths per 100,000 worker-years) declined among self-employed, government, and private workers aged 18 and older; after 1990, while rates of government and private workers remained low, the rate in the self-employed population rose from 5.5 deaths/100,000 worker-years in 1990 to 9.4 deaths/100,000 worker-years in 1994 (Fig. 1). Among privately employed and government workers, there was minimal variation in age-specific death rates (Fig. 2). Age-specific death rates were consistently higher among the self-employed than other workers and increased sharply with attained age (Table II). The age-adjusted death rate was substantially higher among self-employed (7.0 deaths/100,000 worker-years) than among government (1.9 deaths/100,000 worker-years) or private (4.4 deaths/100,000 worker-years) workers.

Homicide deaths and unintentional injuries comprised approximately 97% of deaths among the self-employed and privately employed populations. The proportion of deaths attributed to homicide was notably higher among the self-employed (30.1 vs. 14.7%), as was the proportion resulting from means of death corresponding to homicide, namely, fights, blunt instruments, stab wounds, and guns (Table III). Relative to the privately employed, the fatality rate from injuries that occurred while performing farm-related work was higher among the self-employed (RR = 9.84; 95% CI: 7.26, 13.4).

Fatal occupational injuries among the self-employed were extraordinarily high in several industry groups (Table IV). Industries with one or more deaths among the self-employed population are presented and contrasted to the fatality rates of private employees for these categories. Overall, the numbers of deaths among the self-employed in most industry and occupation groups were small and resulted in high rates due of the relatively uncommon nature of self-employment in these categories (e.g., railroad, water, and air transport). Occupational injury death rates were particularly elevated among the self-employed in retail (RR = 4.32; 95% CI: 3.41, 5.48) and transportation industries (RR = 1.67; 95% CI: 1.19, 2.34). The elevated rate for retail industry work appears to be driven by fatality rates over five times higher in the self-employed among those in eating and drinking establishments (RR = 5.97; 95% CI = 3.30, 10.8), general retail (RR = 5.06; 95% CI = 3.18, 8.06), and grocery/dairy retail (RR = 5.15; 95% CI = 3.60, 7.36). In the grocery/dairy retail industry, occupational fatalities among self-employed and privately employed workers resulted nearly exclusively from homicides (43/46; 93% and 83/86; 97%, respectively).

At the time of autopsy, medical examiners detected alcohol in the blood of 32/274 (12%) of the self-employed decedents. The proportion was lower for the government employees (n = 7/130; 5%) and for private employees (n = 99/1,246; 8%) ($X^2 = 4.01$, $P < 0.05$, and $X^2 = 3.98$, $P < 0.05$, respectively). Workers whose causes of death were explicitly attributed to consumption of alcohol or other substances were excluded from the study, and records for 31% of both non-self-employed and self-employed decedents did not include valid blood alcohol data, therefore, these proportions may not reflect the actual proportion of deaths involving alcohol in either category. Proportions of decedents with positive blood alcohol screens for various industry categories and mean levels of alcohol detected suggest that neither the self-employed nor the non-self-employed population was consistently more likely to be consuming alcohol on the job.

DISCUSSION

In 1997, 1,228 Americans participated in an international survey and responded to the following statement: "I would choose being an employee or self-employed." Among participants, 61.7% indicated a preference for being self-employed [Davis et al., 1997]. The advantages of self-employment are numerous, and involve the freedom to designate working hours, location, and type of work. Disadvantages of self-employment are also numerous, but easy to overlook. Because the conditions of self-employment vary widely between industries, work activities, and individuals, it is difficult to generalize about the obstacles and hazards of self-employment. Disadvantages may include having an unstable income, less rigorous safety and health practices, and in some cases, reduced control of the working environment. In some industries, where employers prefer to contract with self-employed workers in lieu of hiring workers who require insurance and other benefits, the 'employer' supervises workers and acts as an employer without many of the responsibilities that accompany hiring wage and salary workers. The descriptive data presented in this analysis are unable to address the health consequences of these advantages and disadvantages. Instead, they provide a unique and useful glimpse at the demographic and occupational differences between the self-employed and non-self-employed workers who were fatally injured in North Carolina. In this analysis, specific emphasis is given to the comparison of

self-employed workers to privately employed workers in order to focus on potential differences in occupational practice between workers who may perform similar tasks with unequal levels of supervision and safety regulation.

The rate of self-employment in North Carolina appears to be rising. Estimates based on the US Census indicate that the proportion of working adults aged 18 and older who were self-employed each year in North Carolina rose from 8.5% in 1978 to 9.2% in 1994. Because many self-employed individuals may be part of an informal work force, that is, they may not formally declare being self-employed, these numbers may underestimate the actual number of North Carolinians who supervise their own workplaces and activities; the extent of underreporting is difficult to estimate. If self-employment is substantially underreported to the US Census, the fatality estimates presented here may be overestimates of the true fatality rates. Furthermore, underreporting by workers in specific occupations or in older age groups could result in exaggerated fatality rates in these populations.

In North Carolina, the Office of the Chief Medical Examiner collects and standardizes death investigation and classification reports for deaths investigated throughout the state. Data available from this ongoing surveillance system provide an opportunity to compare characteristics of workers, as well as their injuries, activities, and occupations across categories of employment type. Despite the well-developed surveillance system, local medical examiners and coroners do not use standardized definitions of work-relatedness to classify deaths as occurring on-the-job. In a survey of medical examiners and coroners throughout North Carolina, Runyan et al. [1994] posed a series of scenarios and asked the respondents to classify each scenario's work-relatedness. Responses were varied, suggesting that scenarios describing deaths associated with work performed at home and farm work were least likely to be consistently categorized with respect to their work-related status; scenarios involving self-employed workers yielded the least agreement, with several respondents commenting that the deaths were not classified as having occurred on-the-job because the decedents were self-employed. The parent study from which these data were drawn involved a detailed review of the circumstances of each death and the death certificate and medical examiners' classification of work-relatedness. Study personnel developed an additional set of criteria summarizing the likelihood of the fatal injury having occurred on-the-job. This analysis includes only cases judged by study personnel to have occurred on-the-job. If the criteria used by the medical examiner, coroner, certifying physician, or study personnel are not able to correctly classify a death as work-related or as having occurred while the decedent was self-employed, the conclusions suggested here may not adequately reflect the differences between the self-employed and non-self-employed populations.

Data gathered through the National Traumatic Occupational Fatalities (NTOF) surveillance system indicate that rates of fatal occupational injury in the US increase with advancing age across sex, race, and industry categories [Marsh and Layne, 2001]. The findings presented here show that age-specific fatality rates among self-employed workers in North Carolina follow this pattern by increasing sharply with advancing age. However, because rates among government workers remain consistently low and increase only slightly among private employees, it is possible that the age-related mortality pattern for self-employed workers is

largely responsible for the age-related trend reported elsewhere [Loomis et al., 1997; Marsh and Layne, 2001]. In these data, the age-related increasing mortality rate among the self-employed population may reflect unique and unrecognized work- and health-related vulnerabilities in the older self-employed population.

The findings presented here indicate higher overall fatal occupational injury rates among the self-employed than among government and private employees. More specific contrasts vary according to the industry and occupation of the worker; this finding supports and extends previously published comparisons. In a 1996 investigation of whether employment status was associated with self-reported health status among European workers, Benavides et al. [2000] reported that a full-time self-employed population experienced high levels of job dissatisfaction, fatigue, backache, stress, and muscular pain compared to full-time permanent employees. In an analysis of trends in fatal occupational injuries in New Zealand, Feyer et al. [2001] reported a higher rate of work-related fatal injuries for self-employed workers than for paid employees during each year from 1985 to 1994. Overall, the rate among the self-employed population was 60% higher than the rate among paid employees. In the United States, a 1996 publication of fatality rates among construction workers reported a notable difference in fatality rates between self-employed (7.2 deaths/100,000 full time equivalent workers per year) and non-self-employed workers (16.7 deaths/100,000 worker-years) [Pollack et al., 1996]. The investigators attribute the lower death rate in the self-employed workers to the lower proportion of hazardous responsibilities in this group. Our data support this speculation for some occupations, as the death rate among self-employed workers in construction occupations (4.5 deaths/100,000 worker-years) was lower than those of government (14.0 deaths/100,000 worker-years) and privately employed (14.2 deaths/100,000 worker-years) workers (data not shown).

Homicide is a sizable and potentially preventable danger among the self-employed population in North Carolina. Medical examiners investigating the deaths attributed over 30% of the fatal injuries in the self-employed population to homicide and identified violence (e.g., stab injuries, gunshots) as the means of death. Conversely, among privately employed workers only 15% of fatalities were identified as homicide deaths. The crude fatality rate of 2.6 deaths/100,000 worker-years for homicides among the self-employed exceeds that of government workers (0.5 deaths/100,000 worker-years) and private employees (0.7 deaths/100,000 worker-years) by over 400%. The considerable rate differences suggest that personal safety concerns and precautions are important for the self-employed in North Carolina. Previous investigation of workplace homicides in North Carolina identified robberies and disputes as leading causes of homicides in the workplace [Moracco et al., 2000] and found that homicides were more likely to occur in workplaces identified a priori as high-risk industries, such as taxicab service, eating establishments, grocery stores, and convenience stores, than in workplaces not identified as such [Loomis et al., 2001]. In these data, although the context of each homicide is unknown, the high homicide rates in industries such as grocery-retail and taxicab service, which may be subject to robberies, indicate that these industries place all workers, and specifically the self-employed, at risk for homicide.

In these data, a higher proportion of self-employed workers had alcohol detected in their blood at the time of autopsy (self-employed: 12%; privately employed: 8%). This finding is driven largely by the frequency of positive blood alcohol screens among decedents in manufacturing and retail industries. Mean levels of alcohol estimated for each cause of death vary only slightly by self-employment status and the highest blood alcohol levels were detected among the non-self-employed population. In general, neither group of workers showed a consistent tendency to have more frequent positive blood alcohol screens or higher mean blood alcohol levels. However, the greater overall proportion of positive screens among the self-employed may reflect the more unregulated and self-supervised workplaces common for this population.

Self-employed individuals often work unaccompanied and, as a consequence, if they are fatally injured while working, there may be no witnesses to provide details. The non-self-employed population group includes 340 decedents (12%) whose status is unknown. If self-employed workers are more difficult to identify as such, the population for whom worker status is unknown may include self-employed workers. Similarly, since the self-employed often work unaccompanied, medical examiners may be unable to identify fatalities due to injuries sustained while working as having occurred on-the-job.

Despite these important limitations, this analysis benefits from the comprehensive and effective surveillance system in use in North Carolina and standardized review of each fatal occupational injury detected. This information should be used to support programs addressing the unique health and safety issues of this growing and largely unenumerated population. In addition, the analyses presented here begin to answer several important research questions: fatally injured self-employed workers are older than fatally injured non-self-employed workers, both groups are predominantly white and male, homicides and farming-related work deaths comprise a large proportion of fatal injuries in this elusive population. The broader question needing attention pertains to whether knowledge about fatalities in the self-employed population can be used to prevent future injuries and subsequent fatalities in this population. This analysis provides justification for addressing the working conditions of the self-employed population in North Carolina.

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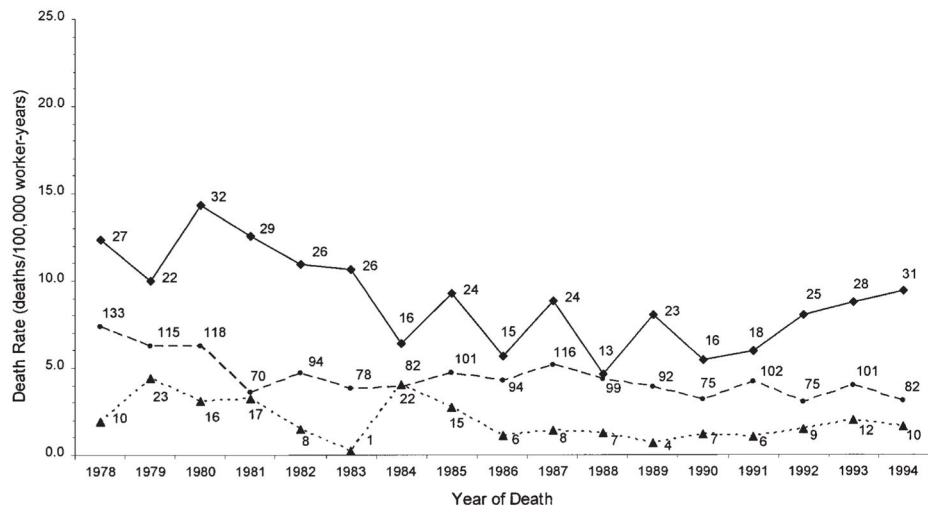


FIGURE 1. Number of decedents and the crude death rate per 100,000 worker-years for self-employed workers (◆), private employees (●), and government employees (▲) aged 18+. The numbers of workers per year are based on estimates generated using interpolation and extrapolation of US Census data. North Carolina, 1978–1994.

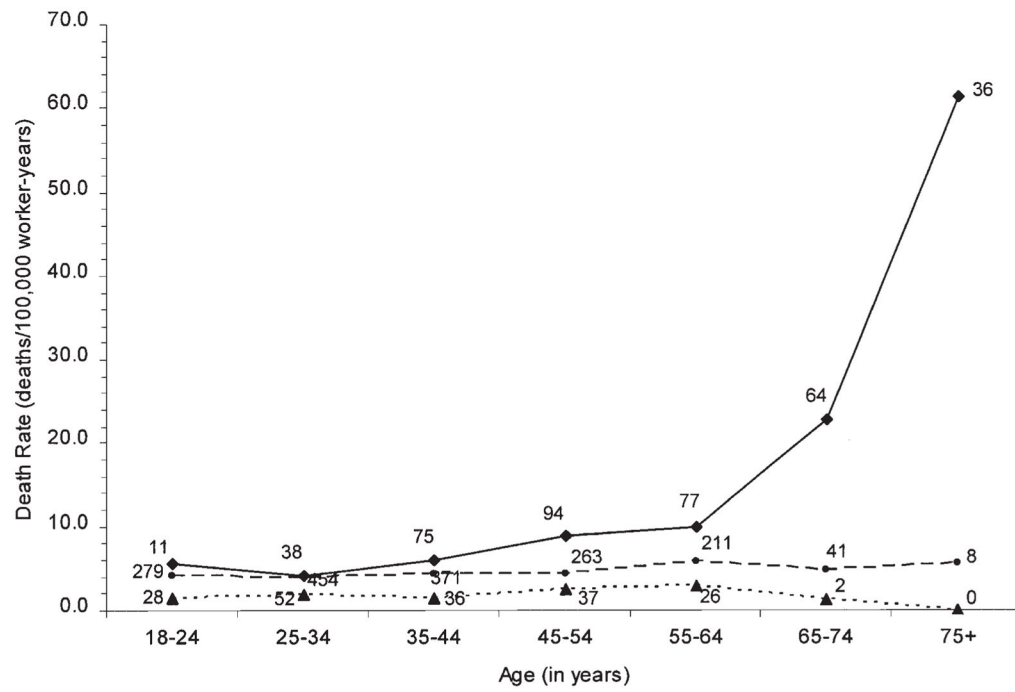


FIGURE 2. Death rates by age for self-employed workers (♦), private employees (●), and government employees (▲) aged 18+. North Carolina, 1978–1994.

TABLE I

Demographic Characteristics of Decedents, North Carolina, 1978–1994

	Self-employed (N = 395) n (%)	Government employed (N = 184) n (%)	Privately employed (N = 1,654) n (%)
Age (years)			
Mean \pm SD	53 \pm 15	39 \pm 13	38 \pm 14
Range	20–91	16–71	13–89
25th–75th percentiles	42–65	26–49	27–48
Age group (years)			
0–17	0	3 (1.6)	26 (1.6)
18–24	11 (2.8)	28 (15.2)	279 (16.9)
25–34	38 (9.6)	52 (28.3)	454 (27.4)
35–44	75 (19.0)	36 (19.6)	371 (22.4)
45–54	94 (23.8)	37 (20.1)	263 (15.9)
55–64	77 (19.5)	26 (14.1)	211 (12.8)
65–74	64 (16.2)	2 (1.1)	41 (2.5)
75+	36 (9.1)	0	8 (0.5)
Race group			
White	338 (85.6)	139 (75.5)	1,206 (72.9)
Black	46 (11.6)	44 (23.9)	418 (25.3)
Other	11 (2.8)	1 (0.5)	42 (2.5)
Sex			
Male	380 (96.2)	175 (95.1)	1,538 (93.0)
Female	15 (3.8)	9 (4.9)	116 (7.0)

Age Distribution of Decedents, Estimated Number of Worker-Years, and Fatality Rates Among Self-Employed, Government, and Private Workers, Aged 18+, North Carolina, 1978–1994

TABLE II

Age group (years)	Self-employed			Government employed			Privately employed		
	Number of deaths	Crude rate ^a	Rate ratio ^b	Number of deaths	Crude rate ^a	Rate ratio ^b	Number of deaths	Crude rate ^a	Rate ratio ^b
18–24	11	5.6	1.4	28	1.5	0.4	279	1.5	0.4
25–34	38	4.2	1.1	52	1.9	0.5	454	1.9	0.5
35–44	75	6.0	1.4	36	1.5	0.4	371	1.5	0.4
45–54	94	8.9	2.0	37	2.4	0.5	263	2.4	0.5
55–64	77	9.9	1.7	26	3.0	0.5	211	3.0	0.5
65–74	64	22.8	4.8	2	1.3	0.3	41	1.3	0.3
75+	36	61.3	11.1	0	0	0	8	0	0
Total	395	4,538,541		181	9,587,551		1,627 ^c	37,312,891	
Fatality rates									
Crude		8.7	2.0		1.9	0.4		1.9	0.4
Age-adjusted		7.0	1.6		1.9	0.4		1.9	0.4

^aNumber of deaths per 100,000 worker-years.

^bRatio of crude (or age-adjusted) rates relative to the rate in the privately employed population.

^cExcludes one decedent due to unknown age.

TABLE III

Causes, Activities, and Means of Death Among Decedents Aged 18+, North Carolina, 1978–1994

	Employment status		RR (95% CI) ^{a,b}
	Self-employed (N = 395) n (%)	Privately employed (N = 1,628) n (%)	
Cause of fatality			
Unintentional injury	268 (67.9)	1,342 (82.4)	1.65 (1.45, 1.88)
Homicide	119 (30.1)	240 (14.7)	4.08 (3.27, 5.08)
Natural environmental factors	4 (1.0)	29 (1.8)	1.13 (0.40, 3.23)
Unintentional/industrial poisoning	4 (1.0)	17 (1.0)	1.93 (0.65, 5.75)
Activity			
Work activity, not farming	295 (74.7)	1,543 (94.8)	1.58 (1.39, 1.79)
Work activity, farming	91 (23.0)	76 (4.7)	9.84 (7.26, 13.4)
Commuting to/from work	2 (0.5)	2 (0.1)	8.22 (1.16, 58.4)
Student activities	0	0	— ^c
Illegal activity for profit	2 (0.5)	0	—
Other non-work activity	1 (0.3)	2 (0.1)	4.11 (0.37, 45.3)
Other/unknown/unspecified	4 (1.0)	5 (0.3)	6.58 (1.77, 24.5)
Means of death			
Unintentional injury			
Animal, insect bite	3 (0.8)	5 (0.3)	4.93 (1.18, 20.6)
Carbon monoxide	4 (1.0)	5 (0.3)	6.58 (1.77, 24.5)
Other poisonings	0	11 (0.7)	—
Cave-in	0	18 (1.1)	—
Other asphyxiation	6 (1.5)	14 (0.9)	3.52 (1.35, 9.17)
Electrocution	14 (3.5)	147 (9.0)	0.78 (0.45, 1.35)
Explosion, fire	17 (4.3)	101 (6.2)	1.38 (0.83, 2.31)
Exposure	0	14 (0.9)	—
Other burns ^d	1 (0.3)	14 (0.9)	0.59 (0.08, 4.47)
Fall	25 (6.3)	177 (10.9)	1.16 (0.76, 1.77)
Falling object	26 (6.6)	154 (9.5)	1.39 (0.92, 2.10)
Tractor	72 (18.2)	42 (2.6)	14.1 (9.63, 20.6)
Other machinery	21 (5.3)	200 (12.3)	0.86 (0.55, 1.35)
Transportation: road vehicles	59 (14.9)	384 (23.6)	1.26 (0.96, 1.66)
Transportation: air	3 (0.8)	28 (1.7)	0.88 (0.27, 2.90)
Transportation: train	3 (0.8)	17 (1.0)	1.45 (0.43, 4.95)
Transportation: water	4 (1.0)	10 (0.6)	3.29 (1.03, 10.5)
Other drowning, not in transport	14 (3.5)	28 (1.7)	4.11 (2.16, 7.81)
Intentional injury			
Violence ^e	120 (30.3)	242 (14.9)	4.08 (3.28, 5.07)
Other intentional injury ^f	0	3 (0.2)	—

^aRR, rate ratio; CI, confidence interval.

^b Rates are based on 4,538,541 self-employed worker-years and 37,312,891 private employee worker-years.

^c RR not calculated when one or more deaths did not occur in each category.

^d Includes scalds, steam, and lightning.

^e Includes fights, blunt instruments, stab injuries, and gunshots.

^f Includes hangs, jumps, dives, and strangulations.

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Fatal Occupational Injuries Among Decedents Aged 18+ by Industry Group, North Carolina, 1978–1994

TABLE IV

Industry groups	Self-employed		Privately employed		RR (95% CI) ^b
	Number of deaths	Rate ^a	Number of deaths	Rate ^a	
Agricultural services	15	15.1	18	10.0	1.51 (0.76, 2.99)
Agriculture	93	18.1	87	18.1	1.00 (0.74, 1.34)
Auto sales/service	12	6.02	25	3.71	1.62 (0.81, 3.23)
Construction	43	5.66	340	14.2	0.40 (0.29, 0.55)
Entertainment, recreation	4	7.74	15	5.12	1.51 (0.50, 4.56)
Finance, real estate	5	2.03	12	0.56	3.62 (1.28, 10.3)
Fishing, hunting, trapping	15	57.3	11	61.4	0.93 (0.43, 2.03)
Forestry, logging	20	50.6	85	88.4	0.57 (0.35, 0.93)
Mining, oil	1	17.6	15	16.5	1.07 (0.14, 8.07)
Sawmill, planing mill	9	39.7	50	19.1	2.08 (1.02, 4.24)
Retail industries	106	13.5	190	3.13	4.32 (3.41, 5.48)
Drug stores	1	6.33	3	1.49	4.42 (0.44, 40.8)
Eating/drinking establishments	16	13.4	34	2.25	5.97 (3.30, 10.8)
Gas/service station	9	17.0	16	9.82	1.73 (0.77, 3.92)
General retail	32	7.04	40	1.39	5.06 (3.18, 8.06)
Grocery/dairy retail	46	45.9	86	8.93	5.15 (3.60, 7.36)
Lodging	2	4.81	11	3.07	1.57 (0.35, 7.06)
Transportation industries	38	36.9	263	22.1	1.67 (1.19, 2.34)
Railroad, water, air transport	1	14.6	42	11.9	1.23 (0.17, 8.92)
Taxicab service	5	56.7	20	88.3	0.64 (0.24, 1.71)
Truck, bus, subway transport	32	36.7	201	24.7	1.48 (1.02, 2.16)

^aCrude fatality rate per 100,000 worker-years.

^bRR, rate ratio; CI, confidence interval.