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# Examining Occupational Health and Safety Disparities Using National Data: A Cause for Continuing Concern

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## Abstract

**Background—**Occupational status, a core component of socioeconomic status, plays a critical role in the well-being of U.S. workers. Identifying work-related disparities can help target prevention efforts.

**Methods—**Bureau of Labor Statistics workplace data were used to characterize high-risk occupations and examine relationships between demographic and work-related variables and fatality.

**Results—**Employment in high-injury/illness occupations was independently associated with being male, Black, ≤high school degree, foreign-birth, and low-wages. Adjusted fatal occupational injury rate ratios for 2005–2009 were elevated for males, older workers, and several industries and occupations. Agriculture/forestry/fishing and mining industries and transportation and materials moving occupations had the highest rate ratios. Homicide rate ratios were elevated for Black, American Indian/Alaska Native/Asian/Pacific Islanders, and foreign-born workers.

**Conclusions—**These findings highlight the importance of understanding patterns of disparities of workplace injuries, illnesses and fatalities. Results can improve intervention efforts by developing programs that better meet the needs of the increasingly diverse U.S. workforce.

### Keywords

occupational health disparities; injury; fatality; occupation; industry; race; ethnicity; nativity; SOII; CFOI; CPS

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## INTRODUCTION

Occupational status, a core component of socioeconomic status (SES), plays a critical role in the material and social well-being of the estimated 155 million U.S. workers [MacDonald et al., 2009; BLS, 2013a]. While employment contributes positively to workers' physical and psychological health, millions suffer work-related injuries, illnesses, or death each year. According to the Bureau of Labor Statistics (BLS), in 2010, approximately 3.1 million workers in private industry and 820,000 in state and local government experienced a nonfatal occupational injury or illness. In addition, over 4,500 U.S. workers died from occupational injuries [BLS, 2011]. Workplace injuries, illnesses and deaths are estimated to cost the U.S. economy at least $250 billion annually [Leigh, 2011]. The annual burden just for those with poverty level wages was $39.1 billion [Leigh, 2012].

Identifying disparities in work-related injury and illness and fatality rates can help target prevention efforts. National systems like the Survey of Occupational Injuries and Illnesses (SOII) and the Census of Fatal Occupational Injuries (CFOI) are two of the systems that are used but these systems are not without limitations [Ruser, 2008; Souza et al., 2010]. For example, the Survey of Occupational Injury and Illness collected by BLS includes race but because it is voluntarily provided, it is missing in approximately one-third of the cases and nativity (also referred to as foreign-birth status) is not captured [BLS, 2009].

In this paper we characterize disparities in nonfatal occupational injury and illness data using the SOII (2008) and the Current Population Survey (CPS) (2010) and fatal occupational injury rates using CFOI data from 2005 through 2009. Disparities are explored by various demographic categories including race/ethnicity, nativity, sex, age, education, and wages. Given the limitation in the capture of demographic data in the nonfatal SOII statistics we use a novel approach by combining nonfatal injury and illness rates for occupation from SOII with data from the Current Population Survey (CPS), a population-based survey that captures occupational as well as demographic characteristics of the working population.

## MATERIALS AND METHODS

### Defining and Characterizing Occupations at High Risk for Nonfatal Injury and Illness

High-risk occupations used here were obtained from the Council of State and Territorial Epidemiologist (CSTE) Occupational Health Indicator "#15: Workers employed in occupations at high-risk for occupational morbidity" [CSTE, 2013]. High-risk occupations are defined as having a "days away from work" nonfatal injury and illness rate that is two or more times the national rate per 10,000 full time-equivalent workers. A total of 61 occupations are provided on this CSTE list. These occupations are all based on Census Bureau occupational codes [U.S. Census Bureau, 2013b]. A complete list of these occupations and their selection criteria are available from CSTE [2013]. CSTE used the 2008 BLS SOII to identify its list of occupations. SOII is a collaborative federal/state program administered by BLS and includes reports of workplace injuries and illnesses from a nationally representative sample of approximately 220,000 private sector employers. The SOII excludes farms with fewer than 11 employees, private household workers, the self-

employed, and federal workers [BLS, 2009]. SOII data used in the CSTE indicator were limited to private sector workers.

Employment estimates by selected demographic characteristics for workers employed in the 61 high-risk occupations identified by Occupational Health Indicator #15 were obtained from the 2010 Current Population Survey (CPS) microdata files. The CPS is a monthly household labor survey conducted for the BLS by the Bureau of the Census and is the primary source of U.S. employment and unemployment statistics [BLS, 2003]. To best match the populations covered by the SOII occupation-specific rates, CPS employment estimates were restricted to private sector wage and salary workers who were aged ≥ 16 years. Corresponding private sector employment estimates were also obtained for all other occupations in the CPS.

The demographic variables examined were age group, sex, race/ethnicity, educational level, nativity, and low wage status. Low wage workers were defined as individuals earning less than $435 per week. This is equivalent to a person working 40 hr a week at, or less than, 1.5 times the current federal minimum wage of $7.25/hr. Race and ethnicity were combined into exclusive categories: Hispanic, Black (Non-Hispanic), American Indian/Alaska Native, Asian, Hawaiian/Pacific Islander, Multiple races (Non-Hispanic), and White (Non-Hispanic). Nativity was defined as U.S.-born, born in a U.S. territory, or born in a foreign country, while educational level was defined as having a high school diploma or less education versus having more than a high school diploma. The age groups used for this study were: 16–17, 18–19, 20–24, 25–54, 55–59, 60–64, and 65 years and older.

Logistic regression was used to calculate unadjusted and adjusted odds ratios for each demographic characteristic. The outcome measure was whether the occupation was classified as high risk or not. Only those variables that were found to be significant at the $\alpha$ =0.05 level for the unadjusted model were included in the multivariate (i.e., adjusted) model.

All logistic models were run using SAS SurveyLogistic software [SAS, 2012]. SurveyLogistic was used to incorporate the sample weights contained in the CPS microdata. To better account for the overall CPS sample design in the models, each State was defined as a cluster sample in SurveyLogistic. The specific CPS weight used for the analysis was the “end of rotation” weight. The use of this weight is due to the CPS sample design. Individual households follow a 16 month cycle in the CPS (4 months in the sample, 8 months removed from the sample, 4 months returned to the sample). Survey questions for specific households may be asked each month they are in the sample, or in fewer months depending on their position in the “4–8–4” cycle. Because the wage data used in our study are only asked in months 4 and 16 for each household, the “end of rotation” weight was used for all demographic variables in the logistic model.

**Occupational Injury Deaths—**Occupational fatality information was extracted from the BLS Census of Fatal Occupational Injuries (CFOI). BLS collects these data from multiple federal, state, and local sources, including death certificates, police reports, and Workers’ Compensation reports. Analysis was conducted using restricted CFOI data that NIOSH

receives through a Memorandum of Understanding with the BLS. The views expressed here do not necessarily reflect the views of the BLS.

To be included in CFOI the decedent must have been employed at the time of the incident, working as a volunteer in the same functions as a paid employee, or present at a site as a job requirement [BLS, 2009]. Public- and private-sector civilian workers are included. CFOI excludes deaths that occurred during a worker's normal commute to and from work and deaths related to occupational illnesses (e.g., lung disease or cancer). CFOI uses its source documents to extract and code demographic information and nativity status as well as information related to the event or exposure that directly caused the death and the occupation and industrial sector in which the decedent was employed. "Foreign-born" refers to nativity status and is defined as persons not born in the U.S. or its territories, including Puerto Rico, Guam, or the U.S. Virgin Islands and includes legal as well as undocumented workers if their deaths were confirmed as work-related. Race/ethnicity was grouped into the following exclusive categories to be consistent with BLS confidentiality requirements and previous analyses: White (Non-Hispanic), Black (Non-Hispanic), American Indian/Alaska Native/Asian/Pacific Islander (AI/AN/A/PI), and Hispanic. Age was aggregated into 10 year increments, with the youngest decedents separated into 15 through 19 years of age and 20 through 24 years of age.

In CFOI, industry is coded according to the 2002 North American Industry Classification System (NAICS) [U.S. Census Bureau, 2013a]. The detailed codes from the 20 NAICS sectors were combined into eight industry sectors according to the similarity of their occupational safety and health risks [NIOSH, 2012]. Occupation in which the decedent worked was coded according to the 2000 Standard Occupational Classification (SOC) Manual [BLS, 2000]. The detailed codes from the 22 civilian SOC groups were combined into 10 occupation groups according to the similarity of their work and occupational safety and health risks [U.S. Census Bureau, 2013b].

To calculate overall fatality rates and homicide rates, labor force denominator estimates were derived from the CPS for workers aged ≥ 15 years. Fatality rates were calculated based on the number of fatalities per 100,000 workers. Poisson regression models were run using SAS Genmod [SAS, 2012] to calculate unadjusted and adjusted fatality rates and 95% confidence intervals.

No review was required by NIOSH's Institutional Review Board since the analysis was conducted on existing data collected by other agencies and did not include any personal identifiers.

## RESULTS

### Workers at Higher Risk for Non-fatal Work-Related Injuries and Illnesses

Of the approximately 500 occupation codes for which BLS provided injury and illness rates, 61 were classified as high risk. In 2010, approximately 16,679,000 wage and salary workers, about 16% of private sector workers, were employed in these high-risk occupations. The proportion of workers employed in high-risk occupations differed significantly by

demographic category (Table I). Although the odds of being in a high-risk occupation for Hispanic, Black, American Indian/Alaska Native, and the multiple race/ethnicity categories were significant in univariate analyses, only the Black race/ethnicity category remained significantly associated with high-risk occupations compared to White workers when adjusted for other demographic factors. Other demographic characteristics including sex, education, nativity, and wages also remained significantly associated with being in high-risk occupations when adjusting for each other and race/ethnicity. Males and those with a high school degree or less had approximately three times the odds of being in these occupations than females and those with more than a high school degree. Birth in a foreign country and being a low wage earner were also associated with having a high-risk job. Age was not significantly (at $P < 0.05$ level) associated with being in a high-risk job, and was therefore not included in the model (Table I).

**Work-Related Fatal Injuries—**Almost 27,000 people died from an injury sustained at work from 2005 to 2009 at a rate of 3.7 deaths per 100,000 workers. Older age, being male, and type of industry and occupation were strong independent predictors of higher fatality rates (Table II). Odds of a fatal injury increased with age as workers aged 65 and older were almost six times as likely to die at work compared to workers aged 15–19. Males were five times more likely to die at work than females even while controlling for age, race/ethnicity, nativity, industry, and occupation.

Both industry and occupation remained predictive of work-related fatality when included in the multivariate model (Table II). The risk of fatality in agriculture/forestry/fishing is significantly higher than for all other industries. After adjusting for the other variables, agriculture/forestry/fishing industry still had the highest rate ratio (12.95)compared to workers in health and social services, the industry with the lowest fatality rate. Mining, transportation/warehousing/utilities, and construction also all had elevated rate ratios. With a fatality rate ratio of 10.63, transportation and materials moving occupations were significantly higher than all other occupation groups. The rate for the construction and extraction occupations group was also significantly higher than seven of the remaining eight occupational groups.

Black and Hispanic race/ethnicities were associated with higher fatality rates in the univariate analysis but this association was not statistically significant when accounting for the remaining variables (Table II). Few unadjusted rates for specific race/ethnicity/nativity categories were significantly different than the national rate for industry or occupation (Table III). For industry, those with significantly higher rates included Black workers in the Agriculture/Forestry/Fishing industry, and foreign-born workers and American Indian/Alaska Native/Asian/Pacific Islanders (AI/AN/A/PI) in the trade sector. The fatality rate of 4.1 deaths/100,000 foreign-born workers in sales and related occupations was significantly higher than the national rate of 1.9 deaths/100,000 workers.

Assaults and violent attacks by a person (homicide) were significantly elevated for Blacks, AI/AN/A/PIs and foreign-born workers (Table III). To explore these factors, disparities in rates of workplace homicide were examined further (Table IV). From 2005 to 2009, there were 2,803 workers that were homicide victims (0.39 per 100,000 workers). As with overall

workplace fatalities, males were more likely to die of a homicide at work compared to females, although the adjusted rate ratio is lower compared to general workplace fatalities (3.92 vs. 5.17, respectively). The adjusted rate ratios for homicides also increased with age; the homicide rate for workers aged 65 and older was almost four and a half times the risk compared to the lowest age category.

Blacks and AI/AN/A/PIs had elevated adjusted homicide rate ratios compared to White workers with Blacks having almost three times the risk and AI/AN/A/PI having more than two times the risk when other demographic factors, industry, and occupation were held constant. Foreign-born workers had a rate ratio almost twice that of all other workers. The majority of victims of homicide at work among Blacks were not foreign-born (83%), whereas the majority of homicide victims among Hispanic workers and AI/AN/A/PI workers were foreign-born (61% and 89%, respectively).

For homicides, the highest risk industries and occupations were different than for general fatalities. Trade and transportation/warehousing/utilities industry sectors had the highest adjusted rate ratios (4.57 and 4.27, respectively) compared to manufacturing, which had the lowest risk for homicide of the eight industry groups. The risk for those in the trade sector was also significantly higher than those in construction, health and social services, and mining. The adjusted rate ratio for sales and related occupations (e.g., store managers, clerks, and cashiers) was 6.64 compared to professional and related occupations and was significantly higher than 5 of the 9 other occupation groups.

## DISCUSSION

The purpose of this analysis was to explore patterns of work-related injuries, illnesses, and fatalities by demographic characteristics including race/ethnicity, sex, education, nativity, wages, industry and occupation using data from the Bureau of Labor Statistics. Our findings suggest that employment in a high-risk occupation (an occupation with an injury or illness rate twice the national average) was associated with being male, being Black, having a high school degree or less, being foreign-born, and receiving low wages after adjusting for all of these variables. Adjusted odds ratios for American Indian/Alaska Natives and Hispanics were also elevated but only borderline significant.

Fatal occupational injury rate ratios for the years 2005 to 2009 were elevated for males and older workers, but not for any racial/ethnic category or nativity category in a multivariate model. Among industries, agriculture/forestry/fishing and mining had increased rates. All occupation groups had elevated rate ratios compared to office and administrative support occupations with sales and related occupations and service occupations being the highest.

Differential distribution of fatal occupational homicides was also found. Men and older workers were at increased risk for occupational homicide compared to women and younger workers, respectively. Black workers were almost three times as likely as White workers to be homicide victims, while AI/AN/A/PI were approximately twice as likely. Foreign born-workers were twice as likely to be homicide victims as those who were not foreign-born.

Workers in the trade and transportation/warehousing/utilities industry sectors and sales and related occupations and service occupations were found to be at highest risk.

This analysis has revealed important patterns of occupational injuries, illnesses, and fatalities by demographic characteristics. In previous research, income, education and occupation have all been considered, alone or in combination, to be components of socioeconomic status [Marmot et al., 1998]. We found wages, education, nativity, and race to be associated with high-risk occupations. Landsbergis [2010] argued that all of the components of socioeconomic status need to be considered to determine how each contributes to health disparities; the components may act as confounders, as mediating variables or there may be interactive effects. Occupational health researchers especially need to be aware of the nature of these associations to understand how each contributes to disparities; adjusting by socioeconomic variables such as wage, education, race, or nativity may mask the contribution of occupation or vice versa. Occupation may be related directly to what hazards exist on the job but immigrant workers may be more hesitant to report these hazards for fear of reprisal and continue to work with the hazard present just as they are reluctant to report injuries [Azaroff et al., 2002; Marín et al., 2009; Gany et al., 2013]. The burden of a work-related injury or illness for lower SES workers may be further compounded by other sources of health inequalities. For example in 2010, 43% of working age adults with an income between 100% and 200% of the federal poverty level did not have access to health insurance for at least part of the previous year [Cohen et al., 2011].

Some of the factors that lead people into higher risk jobs and create disparities are described in depth with extensive literature reviews in articles that resulted from the 2011 national conference, Eliminating Health and Safety Disparities at Work. Landsbergis et al. [2013] discuss how work organization and job insecurity contribute to health disparities; and Siqueira et al. [2013] discuss the effects of social, economic, and labor polices. Discrimination, harassment, and bullying may also play a part [Okechukwu et al., 2013]. Baron et al. [2013] suggest a framework for integrating public health and occupational health as one way to address the complex set of interacting risk factors that cross over from work to community and community to work. Finally, O'Connor et al. [2013] describe approaches to education and training that incorporate cultural, situational and societal aspects of health and safety training that when not considered can contribute to disparities.

Our adjusted findings related to fatal occupational injuries corraborate previous research showing that older workers are at higher risk than younger workers [Rogers and Wiatrowski, 2005]. In their paper, transportation incidents and falls were examined as case studies which suggested that for older workers, the health affects of work related-injury and illness are more serious than the same incidents would be for younger workers.

We also found men to be at higher risk than women after adjusting for occupation and industry. A paper on occupational fatalities among women [Hoskins, 2005] hypothesizes that industrial and occupational segregation by sex partially explains differences in fatalities between the sexes. Some decreases have been seen in occupational segregation by gender in the last 40 years although the decreases have varied with education with the least change

among high school dropouts and blue collar workers [Blau et al., 2013]. This should be examined further as more traditionally “male” jobs open to women and vice versa.

Holding demographic variables such as sex, age, and race/ethnicity constant, we found that both industry and occupation are important factors in understanding work-related fatalities. For example, motor vehicle-related incidents are the leading cause of work-related fatality in the U.S. [NIOSH, 2013a]. Although not shown here, these types of incidents can be seen in the elevated fatality rate ratio in the transportation/warehousing/utilities industry sector as well as in occupations which are distributed throughout most industry sectors [BLS, 2013b] such as transportation & material moving. In recognition of the high fatality rate in the transportation/warehousing/utilities industry sector and transportation and materials moving occupations, in 2010 NIOSH created the NIOSH Center for Motor Vehicle Safety (NCMVS) to address fatalities and injuries related to motor vehicles in various industry and occupation sectors [NIOSH, 2013b].

Although previous research has raised concern over disparities in mortality for Hispanic versus Non-Hispanic construction workers for the years 1992–2000 [Dong and Platner, 2004], our stratified analysis does not show this finding. The U.S. saw an overall decrease in fatalities, including those involving Hispanics, between 2006 and 2009. According to the BLS, “Economic factors likely played a role in the fatality decrease” [BLS, 2009]. For example, in 2008 employment hours decreased overall but especially in construction and other industries which have had historically higher proportions of worker fatalities [BLS, 2009]. Historically high-risk jobs have also had a disproportionate share of Hispanic workers [Richardson, 2005]. Byler [2013] shows a steeper decline in fatality rates for foreign-born Hispanics (6.4, 5.9, 4.8 deaths/100,000 FTE for 2006, 2007, and 2008, respectively) compared to native-born Hispanic workers (3.9, 3.5, 3.4 deaths/100,000 FTE for 2006, 2007, and 2008, respectively); foreign-born though still have higher rates each year than the highest rate for native-born Hispanics. Data for 2011 show the first increase in numbers of fatal work injuries among Hispanics since 2006 [BLS, 2012]. Workers in these historically high-risk groups should continue to be followed closely as the economy improves.

Our findings related to homicide underscore the significant economic and social impact of violence in the workplace. Hartley et al. [2005] estimated the cost of fatal occupational homicides for 1992 through 2001 to be $6.3 billion (1999 dollars). Similar to fatalities in general, males were more likely to be vicitims of homicides at work, although the difference for men and women was not as great as for fatalities overall. We also found that one-fourth of fatalities among women was due to homicide while not quite one-tenth of fatalities among men were due to homicide.

Several other authors who examined earlier years of CFOI data found similar racial and ethnic disparities. For the years 1992–2001, the rate ratio of workplace homicides for Blacks was twice that for White workers [Hartley et al., 2005], while our data show the unadjusted rate for Blacks to be almost three times higher than for White workers. Hartley provides an aggregated homicide rate for all races other than White and Black which was four times that of White workers. Sincavage [2005] examined fatalities in Asian U.S. workers from CFOI

for 1999–2003. She found Asians were four times more likely to be fatally injured in retail trade and slightly more likely in services. For Asians, foreign-birth status was found to be a factor; of the 775 deaths involving Asians from 1999 to 2003, 83% were foreign-born. With a rate 20 times the total rate for all workers, foreign-born, self-employed Asians clearly had the highest homicide risk. Sincavage found that 46% of Asian worker fatalities were homicides, while we found approximately one-third of AI/AN/A/PI fatalities were homicides, the highest proportion for any race/ethnic group.

Menéndez et al. [2013] analyzed the 2003–2008 CFOI data for homicides in selected retail industries including: grocery stores; beer, wine, and liquor stores; gasoline stations; and food services and drinking places. These are just a few of the employer types found within the trade industry, the industry group we found to have the highest homicide rate. In these industries, all racial/ethnic categories were significantly higher than White workers, with risk for Asians six times, and for Blacks almost three times greater. The authors speculate that Black and Asian workers in retail settings have higher homicide rates because they are more likely to work in stores in areas where crime rates are higher and are more likely to be employed in businesses that lack safety measures. In addition, Black and Asian workers may lack important safety training that could protect them during a robbery [Menéndez et al., 2013].

Some progress has been made to understand the circumstances of workplace violence (criminal intent violence; client, customer, or patient violence; worker-on-worker violence; and personal relationship violence) and risk factors (contact with the public, exchange of money, working alone or in small numbers, working late at night or during early morning hours, and working in high-crime areas) [NIOSH, 2006; Menéndez et al., 2013]. It is important that multidisciplinary workplace violence prevention programs that incorporate training and circumstance-specific prevention strategies be available and implemented widely [NIOSH, 2006]. Prevention strategies should be examined to ensure that they are applicable and effective in culturally diverse populations.

Limitations for the SOII, CFOI, and CPS are well documented [BLS, 2009; CDC, 2013a,b; Ruser, 2008; Azaroff et al., 2002]. Our findings may be affected by SOII's exclusion of farms with fewer than 11 employees, private household workers, and the self-employed and the difficulty of identifying work-relatedness of a case, particularly for illnesses with long latency periods. The findings could also be impacted by differences in how the CPS and CFOI define "native-born" status and because volunteers are included in the CFOI but not in the CPS. Also, since the denominators for our fatality rates represent the number of workers and not FTEs, our disparities estimates could be biased if the proportion of part-time workers varies by demographic group. In addition, reporting criteria for the fatality data required combining American Indian, Alaska Native, Asian, and Pacific Island groups. This may bias our results towards the null unless there are comparable rates across these populations. For this analysis, we were most concerned with areas where injuries and illnesses were suspected to be underestimated for some groups of workers such as non-white racial/ethnic groups, foreign-born workers, low-wage workers, or in some industries or occupations more than others. Because it is likely that underestimation of risk is present in these data due to the limitations listed above, our findings of elevated risk, for those working

in high-risk occupations and fatal work injuries including homicides, may underestimate the disparities that exist.

In conclusion, the findings in this paper highlight the importance of understanding the disparities of workplace injuries, illnesses, and fatalities. In addition to highlighting priority industries and occupations, these findings identify some of the unique demographic characteristics of workers in the highest risk industries and occupations. This information can be used to improve intervention efforts by developing programs that better meet the needs of the increasing diversity of the U.S. workforce. All workers, regardless of their race, ethnicity or nativity are afforded equal protection under the Occupational Safety and Health Act. Furthering a culture in which occupational safety and health is recognized and valued as a fundamental component of economic growth and prosperity can play an important role in promoting health equity [Braveman, 2010]. The data presented in this report provide important information to focus prevention efforts.

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## TABLE I

Unadjusted (Univariate) and Adjusted (Multivariate) Logistic Regression Associations for Workers at High Risk of Occupational Injury* and Selected Worker Demographic Characteristics, 2010

| | Unadjusted odds ratio[a] | Lower 95% CI | Upper 95% CI | Adjusted odds ratio[a] | Lower 95% CI | Upper 95% CI |
|---|---|---|---|---|---|---|
| Sex | | | | | | |
| Male | **2.71** | **2.56** | **2.87** | **2.71** | **2.55** | **2.89** |
| Female | 1.00 | — | — | 1.00 | — | — |
| Race/ethnicity[b] | | | | | | |
| Hispanic | **2.15** | **1.90** | **2.44** | 1.17 | 1.00 | 1.38 |
| Black | **1.77** | **1.63** | **1.93** | **1.67** | **1.57** | **1.78** |
| American Indian/Alaska Native | **1.69** | **1.10** | **2.60** | 1.42 | 0.91 | 2.21 |
| Asian | **0.66** | **0.57** | **0.81** | **0.54** | **0.46** | **0.62** |
| Hawaiian/Pacific Islander | 1.26 | 0.98 | 1.63 | 0.97 | 0.78 | 1.19 |
| Multiple | **1.20** | **1.05** | **1.37** | 1.17 | 1.00 | 1.37 |
| White | 1.00 | — | — | 1.00 | — | — |
| Education | | | | | | |
| ≤High school degree | **3.60** | **3.34** | **3.89** | **3.11** | **2.95** | **3.28** |
| >High school degree | 1.00 | — | — | 1.00 | — | — |
| Nativity | | | | | | |
| Foreign country | **1.76** | **1.58** | **1.97** | **1.44** | **1.29** | **1.60** |
| US territory | **1.57** | **1.20** | **2.05** | 1.28 | 0.97 | 1.69 |
| United States | 1.00 | — | — | 1.00 | — | — |
| Wage level[c] | | | | | | |
| Low wage | **1.40** | **1.31** | **1.50** | **1.24** | **1.19** | **1.29** |
| Higher wage | 1.00 | — | — | 1.00 | — | — |

*High-risk occupations are defined as having a “days away from work” non-fatal injury and illness rate that was two or more times the national rate per 10,000 full time-equivalent workers based on the U.S. Department of Labor, Bureau of Labor Statistics 2008 Survey of Occupational Injuries and Illnesses. Employed worker estimates were obtained from the U.S. Department of Labor, Bureau of Labor Statistics Current Population Survey, 2010 (CPS).

[a]Values in bold type are significant at $\alpha$ =0.05 level.

[b]White, Black, American Indian/Alaska Native, Asian, Hawaiian/Pacific Islander, and Multiple Race categories exclude Hispanics.

[c] Low wage is defined as earning ≤$435 per week.

## TABLE II

Unadjusted (Univariate) and Adjusted (Multivariate) Poisson Regression Rate-Ratio Estimates of Fatal Occupational Injuries for the Categorical Variables Age Group, Sex, Race/Ethnicity, Foreign Birth Status, Industry, and Occupation, United States 2005–2009, Census of Fatal Occupational Injuries

| | No. of deaths | Rate[a,b] | Lower 95% CI rate | Upper 95% CI rate | Unadjusted rate-ratio (RR)[b] | Lower 95% CI RR | Upper 95% CI RR | Adjusted rate-ratio (RR)[b] | Lower 95% CI RR | Upper 95% CI RR |
|---|---|---|---|---|---|---|---|---|---|---|
| Sex | | | | | | | | | | |
| **Male** | **24,995** | **6.40** | **6.11** | **6.70** | **10.93** | **10.44** | **11.45** | **5.17** | **4.76** | **5.61** |
| Female | 2,001 | 0.58 | 0.56 | 0.61 | 1.00 | — | — | 1.00 | — | — |
| Age group | | | | | | | | | | |
| 15–19 | 572 | 1.76 | 1.61 | 1.91 | 1.00 | — | — | 1.00 | — | — |
| **20–24** | **1,845** | **2.57** | **2.33** | **2.83** | **1.46** | **1.33** | **1.61** | **1.53** | **1.30** | **1.80** |
| **25–34** | **4,603** | **2.90** | **2.65** | **3.17** | **1.65** | **1.51** | **1.80** | **1.80** | **1.55** | **2.09** |
| **35–44** | **5,720** | **3.36** | **3.08** | **3.68** | **1.91** | **1.75** | **2.09** | **2.13** | **1.83** | **2.47** |
| **45–54** | **6,696** | **3.92** | **3.59** | **4.28** | **2.23** | **2.04** | **2.44** | **2.52** | **2.18** | **2.93** |
| **55–64** | **4,603** | **4.59** | **4.19** | **5.02** | **2.61** | **2.39** | **2.85** | **3.10** | **2.67** | **3.61** |
| **65+** | **2,882** | **9.98** | **9.10** | **10.95** | **5.68** | **5.18** | **6.23** | **5.78** | **4.95** | **6.75** |
| Race/ethnicity | | | | | | | | | | |
| **White, non-Hispanic** | **18,682** | **3.68** | **3.45** | **3.92** | **1.46** | **1.37** | **1.56** | 0.96 | 0.86 | 1.08 |
| **Black, non-Hispanic** | **2,707** | **3.52** | **3.27** | **3.79** | **1.40** | **1.30** | **1.51** | 0.99 | 0.87 | 1.13 |
| American Indian/Alaska Native/Asian/ Pacific Islanders | 982 | 2.52 | 2.36 | 2.68 | 1.00 | — | — | 1.00 | — | — |
| **Hispanic** | **4,367** | **4.36** | **4.07** | **4.68** | **1.73** | **1.62** | **1.86** | **0.89** | **0.79** | **1.00** |
| Nativity status | | | | | | | | | | |
| **Foreign-born** | **4,665** | **3.93** | **3.80** | **4.05** | **1.08** | **1.05** | **1.11** | **0.89** | **0.83** | **0.95** |
| Not foreign-born | 22,331 | 3.64 | 3.59 | 3.69 | 1.00 | — | — | 1.00 | — | — |
| Industry division[c] | | | | | | | | | | |
| **Agriculture/forestry/fishing** | **3,236** | **29.04** | **26.70** | **31.58** | **39.27** | **36.11** | **42.70** | **12.95** | **11.05** | **15.18** |
| **Mining** | **810** | **22.44** | **20.24** | **24.87** | **30.34** | **27.37** | **33.63** | **5.74** | **4.78** | **6.90** |
| **Transportation/Warehousing/utilities** | **4,484** | **11.92** | **10.99** | **12.94** | **16.12** | **14.86** | **17.50** | **2.64** | **2.27** | **3.06** |
| **Construction** | **5,674** | **10.19** | **9.40** | **11.05** | **13.78** | **12.71** | **14.94** | **2.62** | **2.24** | **3.07** |

| | No. of deaths | Rate[a,b] | Lower 95% CI rate | Upper 95% CI rate | Unadjusted rate-ratio (RR)[b] | Lower 95% CI RR | Upper 95% CI RR | Adjusted rate-ratio (RR)[b] | Lower 95% CI RR | Upper 95% CI RR |
|---|---|---|---|---|---|---|---|---|---|---|
| **Services, excluding healthcare** | **7,388** | **2.08** | **1.92** | **2.25** | **2.81** | **2.60** | **3.05** | **1.51** | **1.32** | **1.73** |
| **Trade** | **2,725** | **2.60** | **2.39** | **2.83** | **3.52** | **3.23** | **3.83** | **1.39** | **1.19** | **1.62** |
| **Manufacturing** | **1,984** | **2.50** | **2.29** | **2.73** | **3.38** | **3.09** | **3.69** | 1.12 | 0.96 | 1.32 |
| Health & social services | 664 | 0.74 | 0.69 | 0.80 | 1.00 | — | — | 1.00 | — | — |
| Occupation group[d] | | | | | | | | | | |
| **Transport & material moving** | **7,057** | **16.00** | **14.62** | **17.50** | **30.02** | **27.45** | **32.84** | **10.63** | **9.12** | **12.39** |
| **Construction & extraction** | **5,445** | **12.26** | **11.20** | **13.42** | **23.00** | **21.01** | **25.18** | **6.36** | **5.38** | **7.53** |
| **Install, maintain, repair** | **1,896** | **7.20** | **6.53** | **7.94** | **13.51** | **12.25** | **14.90** | **5.13** | **4.35** | **6.06** |
| **Service** | **3,456** | **2.84** | **2.59** | **3.12** | **5.33** | **4.86** | **5.85** | **4.56** | **3.89** | **5.33** |
| **Farming, fishing, forestry** | **1,405** | **27.27** | **24.63** | **30.19** | **51.18** | **46.23** | **56.66** | **3.97** | **3.28** | **4.81** |
| **Production** | **1,289** | **2.86** | **2.58** | **3.16** | **5.36** | **4.84** | **5.94** | **3.41** | **2.86** | **4.08** |
| **Sales & related** | **1,532** | **1.86** | **1.68** | **2.06** | **3.49** | **3.16** | **3.86** | **2.55** | **2.15** | **3.03** |
| **Management, business, & finance** | **2,896** | **2.70** | **2.46** | **2.97** | **5.07** | **4.61** | **5.57** | **1.81** | **1.54** | **2.12** |
| **Professional & related** | **1,274** | **0.84** | **0.76** | **0.93** | **1.58** | **1.42** | **1.75** | **1.25** | **1.05** | **1.49** |
| Office & administrative support | 516 | 0.53 | 0.49 | 0.58 | 1.00 | — | — | 1.00 | — | — |

[a] Per 100,000 workers aged ≥15 years. Numbers and rates were generated by NIOSH with restricted access data from the Bureau of Labor Statistics (BLS) Census of Fatal Occupational Injuries microdata from 2005 to 2009; the number of employed workers from the BLS Current Population Survey, 2005–2009. Per BLS publication requirements, numbers of deaths are reported for workers of all ages; whereas rates are for workers aged ≥15 years.

[b] Rows in bold are statistically different from the comparison group at $\alpha = 0.05$.

[c] Industry in which the decedent worked was coded according to the 2002 North American Industry Classification System (NAICS). The detailed codes from the 20 NAICS sectors were combined into eight industry sectors according to the similarity of their occupational safety and health risks.

[d] Occupation in which the decedent worked was coded according to the 2000 Standard Occupational Classification Manual (SOC). The detailed codes from the 22 civilian SOC groups were combined into ten occupation groups according to the similarity of their work and their occupational safety and health risks.

## TABLE III

Number and Rate* of Fatal Occupational Injuries by Race/Ethnicity, Nativity, Sex, Age, Injury Event, Industry and Occupation, United States 2005–2009, Census of Fatal Occupational Injuries

| | Total [a] | | Race/ethnicity | | | | | | | | Nativity status | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | White, non-Hispanic | | Black, non-Hispanic | | American Indian/ Alaska Native/Asian/ Pacific Islanders | | Hispanic | | Foreign-born | | Not foreign-born | |
| | No. of deaths | Rate[b] | No. of deaths | Rate[c] | No. of deaths | Rate[c] | No. of deaths | Rate[c] | No. of deaths | Rate[c] | No. of deaths | Rate[c] | No. of deaths | Rate[c] |
| **Total** | **26,996** | **3.7** | **18,682** | **3.7** | **2,707** | **3.5** | **982** | **2.6** | **4,367** | **4.4** | **4,665** | **4.0** | **22,331** | **3.6** |
| Sex | | | | | | | | | | | | | | |
| Male | 24,995 | **6.4** | 17,227 | 6.4 | 2,485 | 7.0 | 893 | 4.4 | 4,151 | 6.9 | 4,416 | 6.3 | 20,579 | 6.4 |
| Female | 2,001 | 0.6 | 1,455 | 0.6 | 222 | 0.5 | 89 | 0.5 | 216 | 0.5 | 249 | 0.5 | 1,752 | 0.6 |
| Age group | | | | | | | | | | | | | | |
| 15–19 | 572 | 1.8 | 342 | 1.5 | 45 | 1.5 | 20 | 2.3 | 163 | **3.6** | 141 | **6.1** | 431 | 1.4 |
| 20–24 | 1,845 | 2.6 | 1,049 | 2.2 | 183 | 2.3 | 69 | 2.2 | 524 | **4.3** | 445 | **4.8** | 1,400 | 2.2 |
| 25–34 | 4,603 | 2.9 | 2,744 | 2.8 | 493 | 2.7 | 153 | 1.6 | 1,162 | 3.9 | 1,054 | 3.4 | 3,549 | 2.8 |
| 35–44 | 5,720 | 3.4 | 3,660 | 3.3 | 689 | 3.6 | 212 | 2.0 | 1,089 | 4.2 | 1,179 | 3.5 | 4,541 | 3.3 |
| 45–54 | 6,696 | 3.9 | 4,802 | 3.8 | 722 | 4.1 | 284 | 3.4 | 836 | 4.8 | 1,034 | 4.0 | 5,662 | 3.9 |
| 55–64 | 4,603 | 4.6 | 3,569 | 4.5 | 395 | 4.7 | 182 | 4.0 | 430 | 5.7 | 610 | 4.8 | 3,993 | 4.6 |
| 65+ | 2,882 | **10.0** | 2,472 | 10.5 | 179 | 8.8 | 56 | 5.0 | 159 | 8.4 | 198 | 5.8 | 2,684 | 10.6 |
| Selected events[d,e] | | | | | | | | | | | | | | |
| Contact with object & equipment[f] | 4,596 | 0.6 | 3,210 | 0.6 | 375 | 0.5 | 108 | 0.3 | 881 | **0.9** | 809 | 0.7 | 3,787 | 0.6 |
| Falls | 3,789 | 0.5 | 2,561 | 0.5 | 219 | 0.3 | 107 | 0.3 | 877 | **0.9** | 879 | 0.7 | 2,910 | 0.5 |
| *Fall to lower level*[g] | 3,279 | 0.5 | 2,175 | 0.4 | 172 | 0.2 | 85 | 0.2 | 826 | **0.8** | 817 | 0.7 | 2,462 | 0.4 |
| Exposure to harmful substances/environs[h] | 2,388 | 0.3 | 1,593 | 0.3 | 220 | 0.3 | 56 | 0.1 | 495 | **0.5** | 446 | 0.4 | 1,942 | 0.3 |
| Transportation incidents | 11,228 | 1.5 | 8,263 | 1.6 | 1,134 | 1.5 | 309 | 0.8 | 1,394 | 1.4 | 1,358 | 1.1 | 9,870 | 1.6 |
| *Highway incident* | 6,407 | 0.9 | 4,669 | 0.9 | 728 | 1.0 | 176 | 0.5 | 780 | 0.8 | 730 | 0.6 | 5,677 | 0.9 |
| Fires & explosions | 800 | 0.1 | 588 | 0.1 | 79 | 0.1 | 12 | 0.03 | 118 | 0.1 | 104 | 0.1 | 696 | 0.1 |
| Assaults & violent acts | 4,097 | 0.6 | 2,403 | 0.5 | 666 | **0.9** | 390 | **1.0** | 582 | 0.6 | 1,052 | **0.9** | 3,045 | 0.5 |
| *Assaults & violent acts by person* | 2,803 | 0.4 | 1,354 | 0.3 | 605 | **0.8** | 334 | **0.9** | 459 | 0.5 | 876 | **0.7** | 1,927 | 0.3 |
| Industry division[i] | | | | | | | | | | | | | | |

| | Total [a] | | Race/ethnicity | | | | | | | | Nativity status | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | White, non-Hispanic | | Black, non-Hispanic | | American Indian/ Alaska Native/Asian/ Pacific Islanders | | Hispanic | | Foreign-born | | Not foreign-born | |
| | No. of deaths | Rate[b] | No. of deaths | Rate[c] | No. of deaths | Rate[c] | No. of deaths | Rate[c] | No. of deaths | Rate[c] | No. of deaths | Rate[c] | No. of deaths | Rate[c] |
| **Total** | **26,996** | **3.7** | **18,682** | **3.7** | **2,707** | **3.5** | **982** | **2.6** | **4,367** | **4.4** | **4,665** | **4.0** | **22,331** | **3.6** |
| Agriculture/forestry/fishing | 3,236 | **29.2** | 2,576 | 31.0 | 130 | **46.9** | 64 | 31.4 | 426 | 19.7 | 399 | 18.7 | 2,837 | 31.7 |
| Mining | 810 | **22.6** | 612 | 22.1 | 38 | 22.3 | 16 | 16.8 | 140 | 27.1 | 57 | 19.1 | 753 | 23.0 |
| Transportation/warehousing/utilities | 4,484 | **11.9** | 3,125 | 12.8 | 679 | 11.5 | 151 | 9.0 | 469 | 9.2 | 663 | 11.6 | 3,821 | 12.0 |
| Construction | 5,674 | **10.2** | 3,661 | 9.8 | 390 | 13.6 | 117 | 9.9 | 1,473 | 10.9 | 1,338 | 10.1 | 4,336 | 10.2 |
| Services, excluding healthcare | 7,388 | 2.1 | 4,995 | 2.0 | 889 | 2.5 | 283 | 1.4 | 1,141 | 2.6 | 1,189 | 2.2 | 6,199 | 2.1 |
| Trade | 2,725 | 2.6 | 1,813 | 2.4 | 275 | 2.8 | 260 | **5.0** | 346 | 2.5 | 644 | **4.3** | 2,081 | 2.3 |
| Manufacturing | 1,984 | 2.5 | 1,373 | 2.5 | 214 | 2.9 | 65 | 1.4 | 327 | 2.8 | 321 | 2.1 | 1,663 | 2.6 |
| Health & social services | 664 | 0.7 | 509 | 0.9 | 90 | 0.6 | 23 | 0.4 | 39 | 0.4 | 49 | 0.4 | 615 | 0.8 |
| Occupation group[j] | | | | | | | | | | | | | | |
| Transport & material moving | 7,057 | **16.0** | 4,837 | 18.0 | 1,020 | 14.8 | 238 | 17.2 | 889 | 10.6 | 1,039 | 12.6 | 6,018 | 16.8 |
| Construction & extraction | 5,445 | **12.3** | 3,412 | 12.4 | 380 | 14.2 | 113 | 12.7 | 1,502 | 11.7 | 1,338 | 11.0 | 4,107 | 12.8 |
| Install, maintain, repair | 1,896 | 7.2 | 1,466 | 7.6 | 145 | 7.2 | 39 | 4.1 | 234 | 6.4 | 198 | 5.5 | 1,698 | 7.5 |
| Service | 3,456 | 2.8 | 2,153 | 3.0 | 504 | 2.8 | 104 | 1.6 | 673 | 2.8 | 607 | 2.3 | 2,849 | 3.0 |
| Farming, fishing, forestry | 1,405 | **27.5** | 844 | 31.0 | 98 | 43.6 | 54 | 44.0 | 376 | 19.3 | 351 | 18.6 | 1,054 | 32.9 |
| Production | 1,289 | 2.9 | 824 | 3.0 | 143 | 2.7 | 51 | 2.0 | 265 | 2.8 | 260 | 2.4 | 1,029 | 3.0 |
| Sales & related | 1,532 | 1.9 | 982 | 1.6 | 154 | 2.1 | 214 | 5.0 | 158 | 1.7 | 448 | **4.1** | 1,084 | 1.5 |
| Management, business, & finance | 2,896 | 2.7 | 2,614 | 3.1 | 84 | 1.1 | 81 | 1.4 | 106 | 1.4 | 192 | 1.5 | 2,704 | 2.9 |
| Professional & related | 1,274 | 0.8 | 1,031 | 0.9 | 93 | 0.7 | 57 | 0.5 | 75 | 0.7 | 144 | 0.7 | 1,130 | 0.9 |
| Office & administrative support | 516 | 0.5 | 359 | 0.5 | 66 | 0.5 | 20 | 0.5 | 63 | 0.5 | 71 | 0.7 | 445 | 0.5 |

[*] Per 100,000 workers aged ≥15 years. Rates were calculated based on the number of fatalities from restricted data from the Bureau of Labor Statistics (BLS) Census of Fatal Occupational Injuries from 2005 to 2009; the number of employed workers from the BLS Current Population Survey, 2005–2009. Per BLS publication requirements, numbers of deaths are reported for workers of all ages; where as rates are for workers aged ≥15 years. The views expressed here do not necessarily reflect the views of the BLS.

[a] Totals include workers of other/unknown race and ethnicity.

[b] Bold text in the total column indicates statistically significant rate differences (α =0.05) that were at least 1.5 times greater than the U.S. rate.

[c] Bold text indicates statistically significant rate differences (α =0.05) that were at least 1.5 times greater than the corresponding row national rate.

[d] Event or exposure according to the BLS Occupational Injury and Illness Classification System.

[e] Totals for major events or exposures include subcategories not shown separately.

[f] Examples include being struck by a falling object such as a tree, being crushed during a cave-in while digging ditches, or getting caught in running machinery.

[g] Examples include falling from a ladder, roof, or scaffold; falling down stairs or steps; or falling through a floor or roof.

[h] Examples include heat stroke or hypothermia, poisoning through inhalation or ingestion of harmful substances, insect stings and animal bites, and non-transportation-related drownings.

[i] Industry in which the decedent worked was coded according to the 2002 North American Industry Classification System (NAICS). The detailed codes from the 20 NAICS sectors were combined into eight industry sectors according to the similarity of their occupational safety and health risks.

[j] Occupation in which the decedent worked was coded according to the 2000 Standard Occupational Classification Manual (SOC). The detailed codes from the 22 civilian SOC groups were combined into ten occupation groups according to the similarity of their work and their occupational safety and health risks.

## TABLE IV

Unadjusted (Univariate) and Adjusted (Multivariate) Poisson Regression Rate-Ratio Estimates of Occupational Homicides for the Categorical Variables Age Group, Sex, Race/Ethnicity, Nativity Status, Industry, and Occupation, United States 2005–2009, Census of Fatal Occupational Injuries

| | No. of deaths | Rate[a] | Lower 95% CI rate | Upper 95% CI rate | Unadjusted rate-ratio (RR) | Lower 95% CI RR | Upper 95% CI RR | Adjusted rate-ratio (RR) | Lower 95% CI RR | Upper 95% CI RR |
|---|---|---|---|---|---|---|---|---|---|---|
| Sex | | | | | | | | | | |
| **Male[b]** | **2,291** | **0.59** | **0.54** | **0.65** | **3.89** | **3.54** | **4.29** | **3.92** | **3.45** | **4.45** |
| Female | 512 | 0.15 | 0.14 | 0.17 | 1.00 | — | — | 1.00 | — | — |
| Age group | | | | | | | | | | |
| 15–19 | 62 | 0.19 | 0.15 | 0.25 | 1.00 | — | — | 1.00 | — | — |
| **20–24** | **207** | **0.29** | **0.22** | **0.39** | **1.51** | **1.13** | **2.01** | **1.80** | **1.24** | **2.60** |
| **25–34** | **589** | **0.38** | **0.29** | **0.49** | **1.95** | **1.49** | **2.55** | **2.64** | **1.88** | **3.71** |
| **35–44** | **714** | **0.42** | **0.32** | **0.55** | **2.18** | **1.67** | **2.85** | **3.09** | **2.21** | **4.34** |
| **45–54** | **633** | **0.37** | **0.28** | **0.48** | **1.91** | **1.47** | **2.50** | **2.99** | **2.13** | **4.20** |
| **55–64** | **415** | **0.41** | **0.31** | **0.54** | **2.13** | **1.62** | **2.79** | **3.39** | **2.40** | **4.80** |
| **65+** | **178** | **0.62** | **0.46** | **0.83** | **3.20** | **2.39** | **4.30** | **4.45** | **3.06** | **6.47** |
| Race/ethnicity | | | | | | | | | | |
| White, non-Hispanic | 1,354 | 0.27 | 0.25 | 0.28 | 1.00 | — | — | 1.00 | — | — |
| **Black, non-Hispanic** | **605** | **0.80** | **0.72** | **0.88** | **2.97** | **2.70** | **3.27** | **2.75** | **2.43** | **3.12** |
| **American Indian/Alaska Native/Asian/ Pacific Islanders** | **334** | **0.87** | **0.77** | **0.98** | **3.25** | **2.88** | **3.66** | **2.12** | **1.77** | **2.55** |
| Hispanic | 459 | 0.46 | 0.41 | 0.51 | **1.72** | **1.54** | **1.91** | 1.05 | 0.90 | 1.24 |
| Nativity status | | | | | | | | | | |
| **Foreign-born** | **876** | **0.74** | **0.69** | **0.80** | **2.35** | **2.17** | **2.55** | **1.81** | **1.59** | **2.07** |
| Not Foreign-born | 1,927 | 0.32 | 0.30 | 0.33 | 1.00 | — | — | 1.00 | — | — |
| Industry division[c] | | | | | | | | | | |
| **Trade** | **790** | **0.76** | **0.60** | **0.95** | **7.67** | **6.08** | **9.67** | **4.57** | **3.31** | **6.32** |
| **Transportation/Warehousing/Utilities** | **267** | **0.70** | **0.55** | **0.91** | **7.15** | **5.55** | **9.20** | **4.27** | **3.02** | **6.04** |
| **Services, excluding Healthcare** | **1,412** | **0.41** | **0.33** | **0.52** | **4.16** | **3.31** | **5.23** | **3.67** | **2.68** | **5.03** |
| **Agriculture/forestry/fishing** | **40** | **0.36** | **0.24** | **0.52** | **3.63** | **2.47** | **5.33** | **2.63** | **1.42** | **4.87** |
| **Construction** | **99** | **0.18** | **0.13** | **0.24** | **1.81** | **1.34** | **2.43** | **1.96** | **1.20** | **3.03** |

| | No. of deaths | Rate[a] | Lower 95% CI rate | Upper 95% CI rate | Unadjusted rate-ratio (RR) | Lower 95% CI RR | Upper 95% CI RR | Adjusted rate-ratio (RR) | Lower 95% CI RR | Upper 95% CI RR |
|---|---|---|---|---|---|---|---|---|---|---|
| Health & social services | 109 | 0.12 | 0.09 | 0.16 | 1.24 | 0.93 | 1.66 | **1.68** | **1.13** | **2.50** |
| Mining | 5 | 0.14 | 0.06 | 0.35 | 1.42 | 0.25 | 3.50 | 1.45 | 0.46 | 4.60 |
| Manufacturing | 80 | 0.10 | 0.08 | 0.12 | 1.00 | — | — | 1.00 | — | — |
| Occupation group[d] | | | | | | | | | | |
| **Sales & related** | **773** | **0.94** | **0.79** | **1.11** | **9.01** | **7.59** | **10.70** | **6.64** | **5.23** | **8.43** |
| **Service** | **841** | **0.69** | **0.58** | **0.82** | **6.64** | **5.60** | **7.88** | **5.96** | **4.79** | **7.43** |
| **Transport & material moving** | **365** | **0.84** | **0.69** | **1.01** | **8.02** | **6.65** | **9.67** | **4.20** | **3.23** | **5.47** |
| **Farming, fishing, forestry** | **26** | **0.51** | **0.33** | **0.78** | **4.88** | **3.20** | **7.45** | **4.06** | **2.00** | **8.21** |
| **Management, business, & finance** | **267** | **0.25** | **0.20** | **0.30** | **2.40** | **1.97** | **2.92** | **2.09** | **1.62** | **2.69** |
| **Production** | **66** | **0.15** | **0.11** | **0.20** | **1.41** | **1.06** | **1.88** | **1.76** | **1.20** | **2.60** |
| **Install, maintain, repair** | **74** | **0.28** | **0.22** | **0.38** | **2.74** | **2.07** | **3.61** | **1.66** | **1.16** | **2.37** |
| **Office & administrative support** | **133** | **0.14** | **0.11** | **0.17** | **1.33** | **1.05** | **1.67** | **1.58** | **1.17** | **2.13** |
| **Construction & extraction** | **82** | **0.18** | **0.14** | **0.24** | **1.77** | **1.36** | **2.32** | **1.65** | **1.06** | **2.58** |
| Professional & related | 162 | 0.10 | 0.09 | 0.12 | 1.00 | — | — | 1.00 | — | — |

[a] Per 100,000 workers aged ≥15 years. Numbers and rates were generated by NIOSH with restricted access data from the Bureau of Labor Statistics (BLS) Census of Fatal Occupational Injuries microdata from 2005 to 2009; the number of employed workers is from the BLS Current Population Survey, 2005–2009. Per BLS publication requirements, numbers of deaths are reported for workers of all ages; whereas rates are for workers aged ≥ 15 years.

[b] Rows in bold are statistically different from the comparison group at $\alpha$ =0.05.

[c] Industry in which the decedent worked was coded according to the 2002 North American Industry Classification System (NAICS). The detailed codes from the 20 NAICS sectors were combined into eight industry sectors according to the similarity of their occupational safety and health risks.

[d] Occupation in which the decedent worked was coded according to the 2000 Standard Occupational Classification Manual (SOC). The detailed codes from the 22 civilian SOC groups were combined into ten occupation groups according to the similarity of their work and their occupational safety and health risks.