7634 U-005-307.14

US DEPT OF LABOR BUREAU OF LABOR STATISTICS, FATAL WORK PLACE INJURIES IN 1993: A COLLECTION OF DATA & ANALYSIS, CONTAINS 1992 DATA FROM REPORT 870 LISTED IN REFERENCES - (USED AS A REFERENCE IN OU3 RI/FS/PP APPENDIX H)

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Fatal Workplace Injuries in 1993: A Collection of Data and Analysis

U.S. Department of Labor
Bureau of Labor Statistics
June 1995

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Fatal Workplace Injuries in 1993: A Collection of Data and Analysis

U. S. Department of Labor
Robert B. Reich, Secretary

Bureau of Labor Statistics
Katharine G. Abraham, Commissioner

June 1995

Report 891

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Preface

The Census of Fatal Occupational Injuries (CFOI), administered by the Bureau of Labor Statistics (BLS) in conjunction with participating State agencies, compiles comprehensive and timely information on fatal work injuries occurring in the 50 States and the District of Columbia. To compile counts that are complete as possible, the census uses multiple sources to tabulate, identify, verify, and profile fatal work injuries. Information about each workplace fatality—occupation and other worker characteristics, equipment being used, and circumstances of the event—is obtained by cross-referencing the source records, such as death certificates, workers' compensation reports, and Federal and State Agency administrative records. Work relationship is verified for each fatality by using at least two independent source documents. (See the technical note for the CFOI work relationship criteria.)

Data compiled by the CFOI program are issued annually for the preceding calendar year. These data are used by safety and health policy analysts and researchers to prevent fatal work injuries by:

- Informing workers of life-threatening hazards associated with various jobs;
- Promoting safer work practices through enhanced job safety training;
- Developing new safety equipment;
- Assessing and improving workplace safety standards; and
- Identifying new areas of safety research.

This report reprints several articles on 1992 and 1993 CFOI data. Most of them were previously in the *Compensation and Working Conditions* or *Monthly Labor Review*; others are appearing for the first time. Sources of the previously published articles are noted in the table of contents. The views and opinions expressed in the articles in this publication belong to the respective authors and do not necessarily reflect the views or policies of BLS.

This report contains six appendices. Appendix A presents detailed breakouts of national data from the 1993 fatal work injury census. Appendix B presents State and metropolitan area data from the 1993 work fatality census. Appendix C has tables of partial data fatal illness on collected through the CFOI program. Appendix D contains summaries of conferences and meetings. Appendix E contains a list of State CFOI agencies and telephone numbers; and Appendix F, a list of CFOI research articles and reports.

There is also a technical note, which presents the CFOI work relationship criteria and definitions of traumatic injury and occupational illness.

BLS safety and health statistics staff wish to thank the participating State agencies for collecting and processing the fatality data presented in this report, as well as the State and Federal Agencies, and private organizations that provided source documents to identify fatal work injuries.

This report was prepared in the Office of Compensation and Working Conditions under the direction of Associate Commissioner Kimberly D. Zieschang and William L. Weber, Acting Assistant Commissioner for Safety, Health, and Working Conditions. Guy Toscano managed the preparation of this bulletin by CFOI staff: Blaine Derstine, Tracy Jack, Andrew Knestaut, Janice Windau, and Mark Zak. Valuable assistance was provided by Martin Personick, from the Division of Safety and Health Statistics, and by Eugene Becker and Yvette Smith, both of the Office of Publications and Special Studies. For additional information on work-related fatalities, call (202)-606-6175.

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The Evolution of Occupational Fatality Statistics in the United States

Culminating nearly a century of research and experience, the Census of Fatal Occupational Injuries is a quantum leap in accuracy

Dino Drudi

Patricia C. Cohen's observation in *A Calculating People: The Spread of Numeracy in Early America* that "in the nineteenth century, what was counted was what counted"[1] is probably, as labor economist Marc Linder suggests, a truism governing the twentieth century as well.[2] And it may well be a universal truth. Cohen notes that the political origins, design, collection, and uses of economic data are in part based on the insight that counting methods embody assumptions about the objects of enumeration.[3] And Linder reminds us that for a long time in American history the objects of enumeration, in this case work-related fatalities, were not considered important enough to count.[4] Indeed, J.M. Clerc went so far as to opine that, at certain junctures in American history, occupational injuries and diseases were considered the inevitable tribute to the progress of the American economy.[5]

Early data lack reliability

The primary problem with counting occupational fatalities has always been the lack of a comprehensive, uniform data source. While at various times estimates have been made based on information drawn from diverse sources, none were sufficient for a comprehensive and accurate count until the Bureau of Labor Statistics (BLS) introduced the Census of Fatal Occupational Injuries in 1992.

Before the 1880s, the chief barrier to occupational fatality data was the lack of any statutory obligation for employers to report workplace fatalities to any State authority. Even thereafter such duties were limited and poorly enforced. The subsequent introduction of State factory inspectors had little impact, as their reports were often incomplete. Differences between individual State reporting requirements further precluded meaningful interstate comparisons.[6] Not even the oldest and most complete industrial injury data series—the statutory requirement for railroads to report injuries to the Interstate Commerce Commission—was entirely trustworthy despite its enforceability by monetary penalties.[7]

In 1907, Arthur Reeves proposed, to no avail, that States require all accidents be reported to their labor bureaus, and that BLS's predecessor, the Bureau of Labor, prepare national tabulations. Ironically, while the wave of enactments of workers' compensation laws in the 1910s provided a much broader and more accurate source of work-related fatality statistics, widely differing State workers' compensation statutes proved an insurmountable obstacle to a nationally uniform, comprehensive reporting system.

In some respects, the enactment of workers' compensation statutes may have actually militated against development of national occupational fatality statistics. In 1926, bills were filed in both houses of the Congress to establish a division of safety within BLS to collect and analyze data on industrial accidents. None of these bills were enacted, however, in part due to views like those of Connecticut Senator Hiram Bingham that State workers' compensation statutes had largely eliminated the problem:[8]

> [I]n Connecticut...[w]e passed an employer's liability compensation act, which requires all employers...to see to it that their employees should be protected at work. Now, this had the very natural effect of making the manufacturers do what they should have done before, look into the causes of their own accidents and guard against them. [T]his is the proper theory of government, put on the individual the initiative of seeing to it that he corrects his own errors, rather than to have the Government to tell him what he must do in order to correct

[1] Patricia Cohen, *A Calculating People: The Spread of Numeracy in Early America*, 1982, p. 207.

[2] Marc Linder, "Fatal Subtraction: Statistical MIAs on the Industrial Battlefield," *Journal of Legislation*, Notre Dame Law School, vol. 20, no. 2, 1994, p. 106.

[3] Cohen, loc. cit., p. 211.

[4] Authur Reeve, "Our Industrial Juggernaut," *Everybody's Magazine*, 1907, p. 147.

[5] J.M. Clerc, *Introduction to Working Conditions and Environment*, vol. 29, 1985.

[6] Linder, loc. cit., p. 107.

[7] *Industrial Accident Statistics*, Bureau of Labor Statistics, Bulletin 157, March 1915, p. 7.

[8] Linder, loc. cit., p. 108.

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them, and that is the reason, I take it, why we do not find it necessary to collect accident statistics any more; it is because the workmen are protected, and the manufacturers themselves are seeing to it that they can and do establish the very latest form of safety devices, for their own protection, and for the saving in insurance, and for the safety of their workers.[9]

Rudimentary national statistics

Without a reliable data source, the U.S. Bureau of Labor published an estimate based on fragmentary data of 17,500 occupational fatalities for 1908. Foreshadowing the recent melange of the National Institute for Occupational Safety and Health, the National Safety Council, the Occupational Safety and Health Administration, and BLS each releasing widely divergent fatality estimates, the Bureau of Labor's estimate of 25,000 occupational fatalities for 1913 contrasted sharply with the U.S. Commission on Industrial Relations' estimate of 35,000. Even Commissioner of Labor Statistics Royal Meeker conceded that "industrial accident statistics for the United States do not exist."[10] A decade later, his successor, Ethelbert Stewart, repeated this same lament.[11]

The rapid enactment of workers' compensation statutes, did, however, enable BLS to improve the quality of occupational fatality statistics for the late 1910s by aggregating fatality claims reported to State workers' compensation agencies. Nevertheless, these figures were accompanied by disclaimers of inadequacy, incompleteness, and noncomparability. By the early 1920s, BLS again incrementally improved the numbers by applying a set of assumptions to the workers' compensation data to estimate occupational fatalities. Even with these improvements:

> Accurate information on industrial injuries in the United States is unfortunately not available. Not only is it impossible to determine with any degree of accuracy the causes of accidents, the nature of the injuries, the extent of the disabilities, the number of workers handicapped through injury, or the cost in time or money lost through industrial injuries, but even the most elementary part of information relating to industrial injuries—the total number of disabling injuries sustained by industrial workers within a given year—is not available for the country as a whole.
>
> It would seem to be a rather simple matter to determine the number of fatal and nonfatal industrial injuries in each State and combine these in a complete tabulation. This, has, however, not been possible, partly through lack of reporting in States which have not adopted workmen's compensation laws or from industries not covered by the law in other States.[12]

From the 1930s to the enactment of the Occupational Safety and Health Act in 1970, a generation of occupational fatality data rested largely with a congressionally chartered private sector organization, the National Safety Council (NSC). This was because the Federal Government lacked the inspection, enforcement, and insurance capabilities with which it could directly gather occupational fatality statistics. NSC methods have changed over the years, but they always have been based on death certificates compiled by the National Center for Health Statistics and annual reports by State registrars of vital statistics.

While death certificates theoretically contain information sufficient to identify occupational fatalities, the NSC recognizes limitations on such data. In practice, death certificates contain too much missing or incomplete information and do not sufficiently identify the industry in which the victim of the occupational fatality worked.[13]

Starting in 1939, BLS published survey-based occupational fatality data. Switching from the previous method of periodically aggregating State workers' compensation figures, the Bureau initiated voluntary direct reporting by employers. Unfortunately, these statistics suffered from severe underreporting. For example, for 1948-49 only a third of construction firms from which BLS requested data filed usable reports. This raised a serious potential for systematic bias in the data—specifically, underreporting by employers with the worst safety records and consequent underestimation of total fatalities.

The American National Standards Institute (ANSI) tried a similar voluntary reporting-based method with its ANSI Z16.1 American Standard Method of Measuring and Recording Work Injury Experience. The ANSI statistics presumably suffered from the same bias toward relatively safety-conscious firms.[14]

To redress these problems, from the late 1930s to the mid 1960s, NSC statisticians conferred with their counterparts at BLS and other Federal Agencies collecting accident data.

> Together they would go over the latest information from BLS surveys, Council estimates, reports from Council members, and special studies, and they would agree on the work death total that both agencies would use. They would also agree on the distribution of those deaths among the major industry groups.[15]

Consequently, during those years BLS and NSC published similar fatality estimates.

> The annual data represent the combined judgment of the technical staffs of the two organizations based on a pooling of all data available to either group.

[9] Hearings on S. 3983, bill to create a Division of Safety in the Department of Labor, before the Senate Committee on Education and Labor, 69th Congress, 1926.

[10] *The Why and How of Uniform Industrial Accident Statistics in the United States*, Bureau of Labor Statistics, Bulletin 210, August 1916, p. 91.

[11] Ethelbert Stewart, "Are Accidents Increasing?" *Monthly Labor Review*, August 1926, pp. 46-49. See also "Industrial Accidents in the United States," *Annals*, January 1926, p. 1.

[12] "Industrial Accidents in the United States, 1917-32," *Monthly Labor Review*, May 1934, pp. 1093-1100.

[13] Linder, loc. cit., pp. 110-111.

[14] Lyle Schauer and Thomas Ryder, "New Approach to Occupational Safety and Health Statistics," *Monthly Labor Review*, April 1972, p.14.

[15] *Documentation of National Safety Council Statistics Department Estimating Procedures for Motor Vehicle, Work, Home, and Public Deaths and Death Rates*, National Safety Council, February 1982, pp. 7-8.

> In the absence of a centralized system of reporting work injuries in the United States, the accumulation of data providing national totals must be based upon the assembly of many bits of data drawn from a wide variety of sources. These basic data frequently overlap or omit entirely certain segments of employment. Additional problems are introduced by a lack of uniformity in the reporting and compilation procedures of the organizations from which the basic data are obtained.[16]

As the Commissioner of Labor Statistics explained to the President's Conference on Occupational Safety in 1954 in a "quasi-dramatic presentation," because the BLS "cannot obtain anywhere a complete count of work injuries...the technical people" at the BLS and NSC "assemble all of these bits and pieces of work-injury data, fit them together like pieces in a jigsaw puzzle...match them up...and make adjustments so that the figures will be comparable."[17]

However, after 1964 BLS-NSC collaboration ceased. Linder reports that the NSC's estimates, cut off from periodic benchmarking with BLS survey data, began, by the late 1970s, to deviate markedly from those published by BLS. Nevertheless, even Linder concedes the NSC data remain the only long-term comprehensive series.[18]

The Occupational Safety and Health Act

The Occupational Safety and Health Act of 1970 inaugurated a new era in job safety and health regulation in the United States. The act, which covers most civilian employment, excludes the self-employed, certain government employees, private household workers, and certain occupations covered by other Federal Agencies (e.g., water, rail, and air transportation and coal, metal, and nonmetal mining).

The act directs the Secretary of Labor to "develop and maintain an effective program of collection, compilation, and analysis of occupational safety and health statistics" and "compile accurate statistics on work injuries and illnesses which shall include all disabling, serious, or significant injuries and illnesses." In recognition of BLS, reputation for producing accurate and impartial statistics, and to assure data collection and publication remain separate from enforcement, the Secretary of Labor delegated responsibility for occupational injury and illness statistics to BLS.

Consistent with that duty, BLS revised and expanded its annual survey of a sample of private establishments by requiring them to report fatalities, as well as nonfatal cases involving lost workdays, transfer to another job, termination of employment, loss of consciousness, and restriction of work or motion.

Estimates of occupational fatalities derived from the survey data were lower than other estimates, due to the exclusion of various workers from survey coverage: The self-employed, public sector employees, and employees of private households. The survey estimates also exclude fatalities for workers in establishments with fewer than 11 employees. Deriving figures for occupational fatalities—a relatively rare event—from a sample survey also is believed to play a part in the low figures.[19]

The Occupational Safety and Health Administration (OSHA) also maintains a reporting system for occupational fatalities. All employers subject to the Occupational Safety and Health Act are required to report occupational fatalities to OSHA. But, because farms with fewer than 11 employees, the self-employed, certain government employment and activities covered by other Federal Agencies are excluded from coverage, OSHA's system typically captures about half of all occupational fatalities.[20]

The act also provided for the establishment of the National Institute for Occupational Safety and Health (NIOSH) whose primary mission includes research for recommending safety and health standards, and conducting training programs. Since 1980, NIOSH has attempted to capture occupational fatality data through the National Traumatic Occupational Fatalities (NTOF) program. But, because the NTOF system is based strictly on death certificates marked "at work" from State vital statistics agencies, even it missed at least a fifth of occupational fatalities.[21] Moreover, death certificates often lack details about the circumstances surrounding fatal occupational injuries.

A complete roster of occupational fatalities

By the mid 1980s, it was clear that the Nation lacked a reliable measure of occupational fatalities. Fatality estimates made by different organizations varied greatly—from 3,000 to 11,000 nationally per year.[22]

BLS commissioned the National Academy of Sciences

[16] *BLS Handbook of Methods for Surveys and Studies*, Bureau of Labor Statistics, Bulletin 1458, 1966, p. 205.

[17] *The President's Conference on Occupational Safety: Proceeding May 4-6*, Bureau of Labor Standards, Bulletin 175, 1954, pp. 7-8.

[18] Linder, loc. cit., pp. 112-113.

[19] *Occupational Injuries and Illnesses in the United States by Industry, 1990*, Bureau of Labor Statistics, Bulletin 2399, April 1992.

[20] Guy Toscano and Janice Windau, "The Changing Character of Fatal Work Injuries," *Monthly Labor Review*, October 1994, pp. 17-728.

[21] Nancy Stout and Catherine Bell, "Effectiveness of Source Documents for Identifying Fatal Occupational Injuries: A Synthesis of Studies," *American Journal of Public Health*, June 1991, pp. 725-28.

[22] The BLS Survey of Occupational Injuries and Illnesses estimated that there were 2,900 work-related fatalities during 1990. For the same year, the NSC estimated 10,500 work-related fatalities. NIOSH's National Traumatic Occupational Fatality program estimated 5,700 work-related deaths for 1989, the latest year for which data from that program are available.

NSC estimates cover unintentional injury-related deaths (homicides and suicides are excluded) of persons in the civilian work force, 14 years and older, except for private household workers. See *Accident Facts: 1994 Edition*, National Safety Council, 1994.

NIOSH estimates cover traumatic injuries (intentional and unintentional) of persons 16 years and older identified on the death certificate as occurring "at work." While death certificates cover all deaths occurring in the State, only those death certificates identifying a fatal injury as one that occurred "at work" are used to compile the number of fatal occupational injuries. Some fatal work injuries, particularly those resulting from motor vehicle accidents, may not be considered work related by persons completing the death certificate. See *National Traumatic Occupational Fatalities: 1980-1985* (National Institute for Occupational Safety and Health, March 1989).

State and Federal workers' compensation reports also fail to capture a census of fatal occupational injuries. The self-employed, employees of small farms, private households, and railroads, as well as seasonal employees, are generally excluded from workers' compensation coverage.

(NAS) to conduct a study of occupational injury, illness, and fatality statistics. NAS "found it rather startling that an agreed upon method has not been devised to estimate a phenomenon as basic as traumatic death in the workplace." NAS suggested that BLS "work with State agencies to carry out studies in which complete rosters of occupational fatalities are compiled from death certificates, medical examiner records, workers' compensation claims, and OSHA reports..."[23]

About the same time, a panel from the Keystone Dialogue Group—a nonprofit organization that facilitates consensus-building discussions among business, labor, and government on public policy issues—emphasized the need to obtain detailed characteristics on fatal workplace injuries on a timely basis. The Keystone panel also recommended the "development of a consensus method for counting work-related fatalities," stating, "development of an accepted count of workplace deaths should mute controversy on this issue stemming from the variety of estimates coming from different sources."[24]

BLS responded by developing a completely new method of compiling occupational statistics. It eschewed the notion of a sample survey—occupational fatalities are too rare to be sampled effectively. Moreover, NAS had called for a complete roster—i.e., a universe—which only a census could provide.

BLS also learned the lesson a century of experience had taught—that there is no one single source of reliable occupational fatality data. Instead, a universe must be assembled from a multiplicity of sources. After two pilot tests, BLS launched the Census of Fatal Occupational Injuries (CFOI) in 1992. Fatalities are identified from as many as 25 different sources, including death certificates; State workers' compensation reports; coroner, medical examiner, and autopsy reports; news media accounts; State motor vehicle reports; and reports received from organizations including State farm Bureaus, local police departments, emergency medical services, and the National Association of Chiefs of Police. In addition, other Federal Agencies having jurisdiction over, or compiling data about, specific groups of workers provide data to BLS. These agencies include the Occupational Safety and Health Administration, the Employment Standards Administration, the Mine Safety and Health Administration, the Department of Defense, the U.S. Coast Guard, the Department of Justice, the Department of Energy, and the National Transportation Safety Board.

As the following table shows, no single source is completely adequate for identifying occupational fatalities, but when several sources are used, a fatality missed by one may be captured by another and will ultimately be included in the data.

[23] *Counting Injuries and Illnesses in the Workplace: Proposals for a Better System*, National Research Council, 1987.

[24] *Keystone National Policy Dialogue on Work-Related Illness and Injury Recordkeeping*, The Keystone Dialogue Group, January 1989.

Table 1. Source documents used to compile information on fatal work injuries, Census of Fatal Occupational Injuries, 1993

Source document	Fatalities	
	Number	Percent
Total	6,271	100
Death certificates	4,409	78
State workers' compensation reports	2,244	36
Coroner, medical examiner, and autopsy reports	3,195	51
Occupational Safety and Health Administration (OSHA) reports	1,840	29
News media	2,332	37
Follow-up questionnaires	1,310	21
State motor vehicle reports	332	5
Other Federal reports	283	5
Other reports	3,775	61

SOURCE: Bureau of Labor Statistics, News release USDL-94-384, August 10, 1994.

Using multiple sources also provides more detailed information about the circumstances surrounding fatal occupational injuries. Information gleaned from various source documents is used to code up to thirty data elements for each job-related fatality.

BLS also relied upon the Federal-State method of data collection used for its other occupational safety and health statistical programs. Data collection at the State level places the collectors closer to the major data sources. Information from other Federal fatality data systems is made available to the States to assist them in their fatality identification.

Mindful of the historical development of occupational fatality statistics, BLS was guided by the following objectives in designing the CFOI program:[25]

Accuracy. Work-related fatalities would generally have to be substantiated by two or more independent source documents or a source document and a follow-up questionnaire.

Comprehensiveness. In accordance with the recommendations of the National Academy of Sciences and the Keystone Dialogue Group, a complete roster of occupational fatalities would be compiled from multiple data sources. This assures data on occupational injury fatalities, regardless of industry, are provided for private and public sector establishments, as well as the self-employed.

Timeliness. Data collection procedures emphasize quick access and processing of source documents to ensure data are published on a current basis. In the first 2 years of the program, data were published 8 to 9 months after the end of the reference year.

[25] Guy Toscano, "The BLS Census of Fatal Occupational Injuries," *Compensation and Working Conditions*, June 1991, p. 1.

Descriptiveness. In addition to enumerating the fatalities occurring in a given year, BLS also provides detailed information about the deceased (e.g., age, race, occupation), the employer (e.g., industry, establishment size), and the incident causing the fatality (e.g., the injury's principal physical characteristics; objects, equipment, or substances contributing to the incident).

Accessibility. A fatality research data base is available to assist safety and health researchers, policy makers, and other groups involved in researching or promoting safety in the workplace. Data are presented so as to prevent identification of decedents and employers to protect their confidentiality.

Conclusion

In sharp contrast to past disclaimers attached to occupational fatality data, when the first national Census of Fatal Occupational Injuries news conference was held in Washington, D.C. on October 1, 1993, U.S. Department of Labor Secretary Robert B. Reich and Acting Commissioner of Labor Statistics William Barron characterized the 1992 national census of occupational fatalities as a "quantum leap" in accuracy.[26] A culmination of nearly a century of research and experience, the CFOI owes its existence in no small part to a long, frustrating record of sincere efforts to gather comprehensive, accurate fatality data. Such efforts are continuing with the BLS fatality census, as it strives to compile a complete count of job-related fatalities.

[26] Statements made by Department of Labor Secretary Robert B. Reich and Acting BLS Commissioner William Baron at the first national CFOI news conference held October 1, 1993.

The changing character of fatal work injuries

The 1993 Census of Fatal Occupational Injuries reveals that most job-related fatalities now occur in service-producing industries, such as trucking firms and retailing; highway fatalities and homicide are leading events

Guy Toscano
and
Janice Windau

Traditional images of workers killed on factory floors and at construction sites no longer square with the worksites of most Americans and the jobs in which they are most likely to be fatally injured. Nationally, about 5 of every 100,000 workers were fatally injured on the job. Recent data from the Bureau of Labor Statistics Census of Fatal Occupational Injuries show that two-thirds of the 6,271 fatal work injuries in 1993 resulted in deaths in transportation-related incidents or because of assaults and violent acts.[1] By contrast, deadly contacts with heavy objects, machinery, and equipment, one of the more traditional classifications of fatalities, accounted for about one-sixth of the total number of fatalities. (See table 1.)

This article summarizes major findings from the 1993 BLS fatality census, a program that provides accurate and verifiable counts of fatal work injuries and profiles where and how these deaths occurred and worker groups that were affected.

Highlights of the 1993 census

Highway-related fatalities. Highway traffic incidents[2] led all other fatal events, accounting for 20 percent of the 6,271 fatal occupational injuries. About half of the highway deaths resulted from collisions between two or more vehicles, a fifth from overturned vehicles, and the remainder mainly from crashing into a stationary object, such as a telephone pole or bridge abutment. The following tabulation shows the various types of work-related fatal highway incidents:

	Number	*Percent*
Total highway fatalities	1,232	100
Collision between vehicles	652	53
Moving in same direction	99	8
Head-on	244	20
At intersection	120	10
Moving and standing vehicle	52	4
Collision with stationary object	188	15
Noncollision	333	27
Jackknifed, overturned	235	19
Ran off highway	57	5
Other or unspecified	59	5

Half of the 1,232 workers killed in highway motor vehicle incidents were driving or riding in a truck—usually a tractor trailer rig, or to a lesser extent, a pickup truck. About a quarter were killed in automobiles. Highway fatalities typically occurred during daylight hours, between 9 a.m and 4 p.m.

Violence at work. Homicide[3] was the second leading cause of job-related deaths, accounting for 17 percent of fatal injuries to workers. Robbery was the primary motive for homicide at work; roughly 1 of 7 victims of workplace homicide was killed by a coworker or personal associate. The following shows the circumstances involved in job-related homicides:

Guy Toscano is an economist and Janice Windau is an epidemiologist in the Office of Safety, Health and Working Conditions, Bureau of Labor Statistics.

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	Number	Percent
Total, job-related homicides	1,063	100
Robberies and miscellaneous crimes	793	75
Work associates	106	10
Coworker, former coworker	59	6
Customer, client	43	4
Police in the line of duty	67	6
Security guard in the line of duty	52	5
Personal acquaintances	45	4
Victim's husband, ex-husband	15	1
Boyfriend, ex-boyfriend	11	1
Other relative	6	1
Other acquaintance	11	1

Approximately half of all homicide victims were workers in retail establishments, such as grocery stores and eating and drinking places. Eleven percent of homicide victims were police and security guards killed in the line of duty. Taxicab drivers also were at particular risk of being shot while working.

About four-fifths of the 1,063 workplace homicide victims were men. But homicide was, by far, the most frequent type of fatal injury for female workers, accounting for 39 percent of their 481 fatal injuries. By comparison, homicides were 17 percent of the 5,790 fatal injuries to men at work. Most of the homicide victims were shot (82 percent); 9 percent were stabbed; the others were beaten, strangled, purposely run over by a vehicle, or killed by fire.

The 1993 census also found that:

- On average, 17 fatal work injuries occurred each day.
- The average age of a fatally injured worker was 42.
- 169 workers under the age of 20 were killed; they were primarily homicide victims in retail establishments or involved in various farm-related incidents.
- 20 percent of job-related fatalities were transportation-related incidents occurring off the highway (such as on farms, in parking lots, or at other industrial sites); workers struck by vehicles; and incidents involving air, water, or rail transport.
- Falls accounted for 10 percent of the fatal work injuries; workers struck by falling or flying objects accounted for 9 percent; electrocutions and workers caught in or under equipment each accounted for 5 percent.
- Occupations with the largest share of fatalities were motor vehicle operators (primarily truck-drivers—12 percent), farming occupations (10 percent), sales occupations (9 percent), and construction trades workers (9 percent).
- The three most dangerous occupations were logging, fishing, and aircraft piloting—each with more than 100 fatalities per 100,000 workers. (The national average was about 5 per 100,000 workers.)
- The number of fatalities was about evenly distributed among seven industry groups. The fatality rate was highest in mining and agriculture, each with 26 fatalities per 100,000 workers; the service industries had one of the lowest rates, at 2 fatalities per 100,000 workers.

Experimental fatality rates

If comparable employment data or hours of exposure are available by occupation, industry, or other demographic characteristics, rates can be calculated to examine the possibility of occurrence of a fatality. Frequencies (absolute numbers) indicate the magnitude of the problem for a given employment group and a fatality rate depicts the risk of incurring a fatal injury faced by workers within the employment group. Thus, rates allow users to compare the risk of a fatal injury among various groups of workers.

BLS has developed experimental fatality rates using annual average employment estimates from the 1993 Current Population Survey (CPS). (See appendix for notes on developing fatality rates.)

Census of Fatal Occupational Injury rates were calculated for major industry divisions, selected occupations, and other demographic characteristics. These rates do not measure the independent effect of a single characteristic, such as age, sex, industry, or occupation. Rates, however, are useful in identifying potential "high risk" groups for further study, such as older workers and the self-employed. Many safety experts consider aggregates of fatalities equally important in developing intervention strategies. For example, a single fatality in a rare occupation, say, elephant training, would result in a high fatality rate for the occupation, yet the magnitude of the problem is small because few workers are employed as elephant trainers.[4]

National fatality profile

Nationally, highway traffic deaths and homicides combined accounted for one-third of the deaths that occurred to workers who were fatally injured. Although fatalities occurred among all occupations and industries, the risk of fatal injury and how workers died varied among occupations and industries. (State profiles of worker fatalities may differ from the corresponding national profile and are discussed later.)

Occupation and event or exposure. Fishers experienced the highest rate of fatal work injury;

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155 of every 100,000 fishers were fatally injured while working during 1993. (See table 2.) Three-fourths of these fatalities resulted from falling from a boat or because the boat capsized.

Loggers and timber cutters, with the second highest injury fatality rate of 133, were fatally injured most often by falling trees. Most of the remaining deaths in this occupation occurred in various types of transport-related incidents.

Workers in farming-related occupations accounted for 10 percent of all fatal work injuries, but represent only 3 percent of the Nation's employment total. They were fatally injured in transportation-related incidents—both on the highway and on the farm—and were caught in or struck by various types of farm machinery.

The fatality rate for workers in sales occupations was relatively low, at 4 per 100,000 workers, but salesworkers incurred nearly 10 percent of all fatal work injuries. This occupational grouping, which includes supervisors and proprietors of retail establishments, salesclerks, and cashiers, accounted for one-third of all workplace homicides.

One of every eight workers who was fatally injured drove a truck or a taxicab for a living. Truckdrivers and driver salesworkers died primarily in motor vehicle traffic incidents, but taxi drivers more often died as a result of homicide. Airplane pilots and navigators were fatally injured at a rate of 103 deaths per 100,000 workers. Virtually all their deaths were in aircraft crashes.

Construction trade workers such as carpenters and electricians accounted for 9 percent of all fatal work injuries and were fatally injured at a rate of 11 per 100,000 workers. Structural metal workers, with the highest rate of fatal injury among the construction trades (76 per 100,000), had 34 deaths that resulted primarily from falls. About half of the fatalities to electricians and electrical power installers and repairers were electrocutions. Laborers in construction were exposed to a variety of life-threatening hazards: highway motor vehicle injuries; being struck by a vehicle; trench cave-ins; being struck by falling objects; falls; and electrocutions.

Protective service occupations accounted for more than half of fatalities to workers in the service occupations, which also include cleaning and building services, food preparation, private household workers, and health services. Firefighters incurred a relatively small number of fatalities, but their rate of fatal injury on the job was three times the national rate and was the highest among the protective service occupations. Nearly half of their deaths occurred as a result of fires and explosions, and about one-third resulted from transport-related incidents. Homicide accounted for more than half the fatalities to police and detectives; the remainder were primarily transport related, including highway motor vehicle incidents and being struck by a vehicle. Security guards also incurred a large proportion of their deaths by homicide.

Executives, administrators, and managers accounted for about 7 percent of the fatal work injuries, with about two-thirds of their fatalities caused by homicides and suicides and by transportation-related incidents.

Worker characteristics. Men, the self-employed, and workers aged 55 and older appear to have a higher risk of workplace fatality relative to their share of employment. (See table 3.)

Most noticeable about the data on the type of fatalities among certain worker groups is the pro-

Table 1. Fatal occupational injuries by event or exposure, 1993

Event or exposure[1]	Fatalities	
	Number	Percent
Total	6,271	100
Transportation incidents	2,482	40
Highway	1,232	20
Collision between vehicles, mobile equipment	652	10
Vehicle struck stationary object or equipment	188	3
Noncollision	333	5
Jackknifed or overturned—no collision	235	4
Ran off highway—no collision	57	1
Nonhighway (farm, industrial premises)	392	6
Overturned	212	3
Fell from and struck by vehicle, mobile equipment	87	1
Aircraft	280	4
Worker struck by a vehicle	361	6
Water vehicle	119	2
Railway	85	1
Assaults and violent acts	1,309	21
Homicides	1,063	17
Shooting	874	14
Stabbing	95	2
Self-inflicted injury	215	3
Assaults by animals	31	([2])
Contact with objects and equipment	1,039	17
Struck by object	563	9
Struck by falling object	345	6
Struck by flying object	81	1
Caught in or compressed by equipment or objects	308	5
Caught in running equipment or machinery	150	2
Compressed or pinched by rolling, sliding, or shifting objects	56	1
Caught in or crushed in collapsing materials	138	2
Falls	611	10
Exposure to harmful substances or environments	590	9
Contact with electric current	324	5
Exposure to caustic, noxious, or allergenic substances	116	2
Oxygen deficiency	111	2
Drowning, submersion	89	1
Fires and explosions	201	3
Other events or exposures[3]	38	1

[1] Based on the 1992 BLS Occupational Injury and Illness Classification Structures. The event describes the manner in which the injury was inflicted or produced.

[2] Less than 0.5 percent.

[3] Includes the category "Bodily reaction and exertion."

NOTE: Totals for major categories may include subcategories not shown separately. Percentages may not add to totals because of rounding.

SOURCE: Census of Fatal Occupational Injuries, 1993.

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Table 2. **Fatal occupational injuries by occupation and event or exposure, 1993**

Occupation[1]	Number of fatalities	Event or exposure (percent): Transportation incidents	Assaults and violent acts	Contact with objects and equipment	Falls	Exposure to harmful substances or environments	Fires and explosions	Employment (thousands)[2]	Fatalities per 100,000 employed[3]
Total	6,271	40	21	17	10	9	3	120,791	5
Managerial and professional specialty	681	42	32	7	8	9	1	32,280	2
Executive, administrative, and managerial	427	35	37	10	9	7	1	15,376	3
Professional speciality	254	54	22	4	6	11	2	16,904	2
Technical, sales, and administrative support	842	37	53	3	3	3	1	36,814	2
Technicians and related support occupations	167	81	4	4	4	5	2	4,014	4
Airplane pilots and navigators	104	98	—	—	—	—	—	101	103
Sales occupations	556	22	70	2	2	2	1	14,245	4
Administrative support occupations, including clerical	119	40	43	7	5	4	—	18,555	1
Service occupations	539	28	46	5	8	8	5	16,522	3
Protective service occupations	288	34	48	3	4	5	6	2,152	13
Firefighting and fire prevention occupations, including supervisors	39	36	—	—	8	—	46	244	16
Police and detectives, including supervisors	149	42	51	4	—	—	—	1,019	15
Guards, including supervisors	100	21	62	—	6	9	—	889	11
Farming, forestry, and fishing	961	46	5	33	5	10	1	3,326	28
Farming operators and managers	409	52	4	32	3	7	2	1,170	35
Other agricultural and related occupations	319	40	8	27	10	14	1	1,963	16
Farm workers, including supervisors	209	52	7	27	3	10	1	838	24
Forestry and logging occupations	142	20	—	69	5	4	—	132	108
Timber cutting and logging occupations	124	18	—	73	3	4	—	93	133
Fishers, hunters, and trappers	91	75	—	3	—	21	—	61	149
Fishers	79	73	—	4	—	23	—	51	155
Precision production, craft, and repair	1,095	20	9	22	24	20	5	13,326	8
Mechanics and repairers	317	23	15	27	9	19	7	4,416	7
Construction trades	565	18	4	14	37	22	4	5,004	11
Carpenters	96	17	—	15	48	17	—	1,276	7
Electricians	78	13	—	—	23	53	6	666	12
Electrical power installers and repairers	42	12	—	7	19	57	—	110	38
Structural metal workers	34	—	9	21	62	—	—	45	76
Operators, fabricators, and laborers	1,959	50	12	18	8	7	4	17,038	11
Machine operators, assemblers, and inspectors	205	11	9	37	9	14	19	7,415	3
Transportation and material-moving occupations	1,182	67	13	11	5	3	1	5,004	24
Motor vehicle operators	917	71	15	8	3	2	1	3,825	24
Truckdrivers	731	80	4	9	3	2	1	2,786	26
Driver-sales workers	41	76	17	7	—	—	—	178	23
Taxicab drivers and chauffeurs	113	13	86	—	—	—	—	225	50
Material-moving equipment operators	180	44	4	33	11	7	2	1,009	18
Handlers, equipment cleaners, helpers, and laborers	572	30	12	25	15	13	4	4,619	12
Construction laborers	218	29	3	29	22	14	2	658	33
Laborers, except construction	202	32	8	28	12	14	6	1,127	18
Military	121	64	9	11	5	6	5	1,485	8

[1] Based on the 1990 Occupational Classification System developed by the Bureau of the Census.

[2] The employment is an annual average of employed civilians 16 years of age and older, plus resident Armed Forces, from the 1993 Current Population Survey (CPS).

[3] Experimental measure, using CPS employment data. This rate represents the number of fatal occupational injuries per 100,000 employed, and was calculated as follows:

$$N/W \times 100{,}000,$$

where N = number of fatal work injuries and W = employment based on the 1993 CPS.

N was adjusted to maintain consistency with employment coverage (W) in the rate calculation.

NOTE: Totals for major categories may include subcategories not shown separately. Percentages may not add to totals because of rounding. Dashes indicate no data reported or data that do not meet publication guidelines. There were 73 fatalities for which there was insufficient information to determine an occupation classification.

SOURCE: Census of Fatal Occupational Injuries, 1993.

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portion of homicides among Asians and Pacific Islanders and female workers who were fatally injured. The proportion reflects at least in part the jobs typically held by these workers. Both groups have a high proportion of employment in retail trade. Other workers with an unusually high proportion of fatalities due to homicide include the self-employed; workers 16 and 17 years old; Hispanics; and nonwhites, except American Indians.

The slightly higher than average proportion of fatal contacts with objects and equipment for the self-employed and the younger age groups is explained in part by these groups' employment on farms. Farm workers are often struck by falling trees, caught in farm machinery, and engulfed in collapsing grain in silos or other storage facilities. Loggers who were primarily struck by falling trees added to the toll for the self-employed.

Industry and event or exposure. Agriculture, forestry, and fishing and mining had the highest rates of fatal work injury of all industry divisions. (See table 4.) The rate for agricultural services was particularly high, with 94 workers killed per 100,000 workers employed. Workers in this industrial group perform activities such as crop planting, dusting, and harvesting; veterinary and other livestock services; and landscape and other horticultural services. In addition to incurring transportation-related injuries, landscape and horticultural workers were at risk of suffering fatal injury from falling trees, falls from trees, and contact with electric current. Workers in

Table 3. Fatal occupational injuries by selected worker characteristics and event or exposure, 1993

Characteristics	Number of fatalities	Event or exposure (percent)						Employment (thousands)[1]	Fatalities per 100,000 employed[2]
		Transportation incidents	Assaults and violent acts	Contact with objects and equipment	Falls	Exposure to harmful substances or environments	Fires and explosions		
Total	6,271	40	21	17	10	9	3	120,791	5
Employment status									
Wage and salary workers	4,981	41	19	16	10	10	4	110,133	5
Self-employed[3]	1,290	34	28	21	8	7	2	10,658	12
Sex and age									
Men	5,790	40	19	17	10	10	3	66,029	9
Women	481	40	42	6	4	6	2	54,761	1
Both sexes:									
Under 16 years	29	34	21	28	—	10	—	—	—
16 to 17 years	39	38	28	21	8	—	—	2,142	2
18 to 19 years	101	42	19	14	6	16	4	3,388	3
20 to 24 years	502	35	21	19	6	15	4	12,613	4
25 to 34 years	1,510	40	22	14	8	12	3	32,703	5
35 to 44 years	1,576	38	22	17	10	9	4	32,691	5
45 to 54 years	1,193	40	21	16	11	9	3	22,450	5
55 to 64 years	801	42	19	18	12	5	2	11,313	7
65 years and older	514	43	17	20	13	4	2	3,409	15
Race or Hispanic origin									
White	5,106	42	18	17	10	10	3	103,917	5
Black	664	33	28	17	8	10	4	12,444	5
Asian or Pacific Islander	190	16	66	4	7	5	—	—	—
American Indian, Aleut, Eskimo	47	40	17	11	9	15	9	—	—
Other or unknown race	263	37	33	13	9	5	2	—	—
Hispanic[4]	604	29	34	15	10	9	3	9,272	6

[1] The employment is an annual average of employed civilians 16 years of age and older, plus resident Armed Forces, from the 1993 Current Population Survey (CPS).

[2] Experimental measure using CPS employment data. This rate represents the number of fatal occupational injuries per 100,000 employed and was calculated as follows:

$$N/W \times 100{,}000,$$

where N = number of fatal work injuries and W = employment based on the 1993 CPS. N was adjusted to maintain consistency with employment coverage (W) in the rate calculation.

[3] Includes paid and unpaid family workers and may include owners of incorporated businesses or members of partnership.

[4] Persons identified as Hispanic may be of any race. Hispanic employment does not include resident Armed Forces.

NOTE: Percentages may not add to totals because of rounding. Dashes indicate no data reported or data that do not meet publication guidelines.

SOURCE: Census of Fatal Occupational Injuries, 1993.

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other agriculture-related industries died in highway vehicle incidents, in tractor rollovers, or from running machinery or were engulfed in grain.

Although mining had the second lowest number of fatalities among industry divisions, its fatal work injury rate was tied with that of agriculture, forestry, and fishing. Among fatalities in coal mining, 70 percent were caused by contact with objects such as large rocks or equipment or mine cave-ins.

Table 4. **Fatal occupational injuries by industry and event or exposure, 1993**

Industry	SIC code[1]	Number of fatalities	Event or exposure (percent)						Employment (thousands)[2]	Fatalities per 100,000 employed[3]
			Transportation incidents	Assaults and violent acts	Contact with objects and equipment	Falls	Exposure to harmful substances or environments	Fires and explosions		
Total	....	6,271	40	21	17	10	9	3	120,791	5
Private industry	....	5,590	38	21	18	10	10	3	100,791	6
Agriculture, forestry and fishing	....	855	51	5	26	6	11	1	3,172	26
Agricultural production—crops	01	398	59	3	27	2	7	2	900	43
Agricultural production—livestock	02	209	39	10	35	4	10	—	1,160	17
Agricultural services	07	153	33	8	22	20	17	—	163	94
Mining	....	174	27	3	42	8	14	5	669	26
Coal mining	12	40	12	—	70	—	15	—	114	35
Oil and gas extraction	13	94	33	4	32	10	15	4	371	25
Construction	....	924	25	4	20	30	17	3	6,724	14
General building contractors	15	152	23	5	21	38	10	3	—	—
Heavy construction, except building	16	255	37	3	29	11	16	4	—	—
Special trades contractors	17	517	20	4	16	36	20	4	—	—
Manufacturing	....	762	29	9	36	8	11	6	19,444	4
Food and kindred products	20	82	35	10	24	10	15	6	1,760	5
Lumber and wood products	24	204	28	2	63	3	—	—	704	29
Transportation and public utilities	....	890	65	16	8	3	5	2	6,867	13
Local and interurban passenger transportation	41	130	18	78	—	—	—	—	472	28
Trucking and warehousing	42	467	79	5	9	2	2	1	2,163	22
Transportation by air	45	79	87	—	5	4	—	—	724	11
Electric, gas, and sanitary services	49	72	38	7	19	6	22	8	1,597	5
Wholesale trade	....	250	55	15	13	8	4	4	4,598	5
Retail trade	....	784	18	70	5	2	3	1	20,070	4
Food stores	54	223	7	89	—	2	—	—	3,412	6
Automotive dealers and service stations	55	138	28	54	8	3	4	—	2,041	7
Eating and drinking places	58	199	15	76	3	2	4	—	6,036	3
Finance, insurance, and real estate	....	116	31	40	3	15	11	—	7,728	2
Services		758	35	28	10	9	13	4	31,516	2
Business services	73	188	32	26	9	15	12	4	4,643	4
Automotive repair, services, and parking	75	116	22	32	22	3	11	9	1,470	8
Government[4]	....	681	52	23	7	7	6	5	20,001	3
Federal (including resident Armed Forces)	....	186	61	16	7	7	4	4	4,941	4
State	....	146	64	18	5	5	5	2	4,905	3
Local	....	340	42	30	7	7	7	7	10,155	3
Police protection	9221	87	44	49	3	—	—	—	—	—

[1] *Standard Industrial Classification Manual*, 1987 edition.

[2] The employment is an annual average of employed civilians 16 years of age and older, plus resident Armed Forces, from the 1993 Current Population Survey (CPS).

[3] Experimental measure using CPS employment data. This rate represents the number of fatal occupational injuries per 100,000 employed and was calculated as follows:

$$N/W \times 100{,}000,$$

where N = number of fatal work injuries and W = employment based on the 1993 CPS.

N was adjusted to maintain consistency with employment coverage (W) in the rate calculation.

[4] Includes fatalities to workers employed by government organizations, regardless of industry.

NOTE: Totals for major categories may include subcategories not shown separately. Percentages may not add to totals because of rounding. Dashes indicate no data reported or data that do not meet publication guidelines. There were 77 fatalities for which there was insufficient information to determine a specific industry classification, although a distinction between private and government was made for each.

SOURCE: Census of Fatal Occupational Injuries, 1993.

Workers in the manufacture of lumber and wood products died at a rate of nearly 30 workers per 100,000. Fatally injured workers in this industry were primarily loggers and timber cutters who were killed by falling trees or in transportation-related incidents.

Local and intercity passenger transport and trucking and warehousing also were particularly hazardous for their workers. High rates in these industries reflect the frequency with which taxicab drivers were murdered while on the job and truckdrivers killed on the highway.

Location and event or exposure. One-fourth of fatal incidents occurred on a street or highway, primarily the result of motor vehicle incidents. About one-fifth occurred at a construction site, warehouse, factory, or other industrial site. (See table 5.)

About 1 of every 7 fatalities occurred in a public building such as a grocery or other retail store, office building, restaurant, or school. These fatalities were primarily the result of homicides, as were a large proportion of the fatalities that occurred in parking lots, apartment buildings, and residential institutions.

The primary causes of fatal injuries on farms were transportation-related incidents, such as tractor rollovers and falls from tractors, and in various contacts with objects and equipment, such as running machinery, falling objects, or collapsing grain or other materials.

State fatality profiles

Ten States combined accounted for about half of the fatal job-related injuries: California, Florida, Georgia, Illinois, Louisiana, New York, North Carolina, Pennsylvania, Tennessee, and Texas. In contrast, half of the remaining States had fewer than 100 fatalities each. Homicide was the leading cause of death in about one-third of the States, while highway traffic fatalities led all other categories in most of the remaining States. Participating State agencies are expected to release their data later this year.

When comparing fatality rates among States, one must consider the industry mix in the States. For example, a State with a large agricultural economy should not be compared with a State having a large manufacturing economy; agriculture has one of the highest fatality rates, and manufacturing has one of the lowest.

In addition, transportation-related fatalities, particularly plane crashes, should not be used in calculating State rates because the denominator used in the calculation is the number of workers employed in the State, while the victims, the numerator, may be workers who are traveling but are employed in other States. Thus, because the numerator and denominator do not cover the same population, calculating the risk of a fatal work injury would be misleading.

States are using up to 25 independent data sources to identify, substantiate, and code the circumstances of work-related fatalities. The major data sources include death certificates marked "at work"; workers' compensation reports and claims; Occupational Safety and Health Administration, State farm bureau, police, coroner, and medical examiner reports; and newspaper stories. As States identify additional sources of occupational fatality information, their census counts will be more complete. An increase in the fatality counts should not be automatically construed as a failure of safety efforts, but possibly an improvement in identifying and capturing vital information that can be analyzed and used to save lives.

In addition, the number of fatalities and their characteristics can change markedly from year to year, particularly among States. For example, the floods of the Mississippi River in 1993 put many workers in the bordering States in harm's way. These types of natural disasters would affect the comparison of 1993 data with those of any other year at the State and national levels.

While comparisons of fatality rates among States may be difficult to analyze, individual State data are useful for injury prevention. Absolute numbers are equally important in monitoring the magnitude of a problem in a State. The information can be used to alert employers and employees of serious injuries and how they occur; policymakers can judge the magnitude of a specific hazard to justify prevention programs; and researchers can isolate the circumstances surrounding specific problems, such as homicides in retail trade, and develop strategies for prevention.

Possible uses of the data

Although BLS had been measuring workplace safety since 1912, the 1992 national census was a "quantum leap" in accuracy.[5]

The safety and health community previously lacked detailed information needed to assess the full scope of incidents leading to workplace fatalities. The wealth of information compiled by the Census of Fatal Occupational Injuries will yield vital insights that may help prevent fatal on-the-job injuries many safety experts regard as sentinel events in that their occurrence indicates a failure in preventive practices.[6]

The national database will help users generate fatality profiles for specific industries and populations and study fatalities involving certain types of machinery or events and hazardous work

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activities. This information is invaluable in targeting injury prevention efforts. These studies also help identify workplace standards that require revision and highlight areas in which intervention strategies need to be developed.

About the census

Collection methods. The Census of Fatal Occupational Injuries program is a cooperative venture in which the operating costs are shared equally by State and Federal Governments. States are responsible for data collection, follow-up procedures, and coding. About 20 data elements, including the demographic characteristics of the decedent and circumstances of the fatal event, are coded according to standard instructions. Up to 10 additional data elements are coded, depending on the availability of information on the fatal injury.

Information collected for each reported fatality case includes the industry of the employer, equipment or machines involved, activity the worker was performing at the time of the incident, occupation of the worker, and location of the incident.

States obtain this information from death certificates, workers' compensation reports, and other reports provided by State administrative agencies. Additional information is provided to

Table 5. **Fatal occupational injuries by location of incident and event or exposure, 1993**

Location	Number of fatalities	Event or exposure (percent)[1]					
		Transportation incidents	Assaults and violent acts	Contact with objects and equipment	Falls	Exposure to harmful substances or environments	Fires and explosions
Total	6,271	40	21	17	10	9	3
Street or highway	1,740	85	8	3	1	2	—
Industrial place or premises	1,373	15	8	33	21	15	7
Industrial place and premises, unspecified	230	5	7	43	11	20	12
Dockyard	39	28	8	28	23	10	—
Loading platform, factory or store	73	18	7	40	16	14	4
Railway yard, including railway line, tracks	85	76	7	4	7	4	—
Warehouse	75	15	27	24	21	12	—
Construction site	398	11	3	30	38	15	2
Industrial place or premises, n.e.c.	380	9	13	34	14	19	11
Other specified place[2]	1,016	42	17	18	8	12	3
Parking lot, garage (employer's premises)	149	15	50	12	7	9	7
Parking lot, garage (except employer's premises)	62	11	44	23	6	10	5
River	69	72	4	6	—	14	—
Sea	120	72	—	3	6	17	—
Public building[3]	964	1	76	4	9	6	3
Market, grocery or other commodity	244	—	95	—	3	2	—
Office building	125	—	72	6	9	11	2
Restaurant, cafe	127	—	83	—	4	9	2
Shop, commercial store (except grocery)	225	2	78	6	6	2	6
School (State, public, private)	40	—	28	10	32	15	10
Farm	641	47	5	32	5	9	1
Farm buildings	66	6	6	44	23	18	—
Farm land under cultivation, fields, meadows	207	66	3	23	2	5	—
Private residence[4]	231	5	26	13	28	20	7
Apartment	50	—	42	—	28	18	8
Mine, quarry	104	13	—	59	8	13	4
Mine	48	8	—	73	—	10	—
Place for recreation and sport	71	23	13	10	17	37	—
Residential institution[5]	37	—	46	22	8	8	11
Unspecified place	94	19	19	14	17	18	4

[1] Based on the 1992 BLS Occupational Industry and Illness Classification Structure.

[2] Includes primarily outdoor areas such as bodies of water, woods, noncultivated fields, and parking lots.

[3] Buildings and adjacent grounds used by the general public or a particular group, such as hotels, restaurants, stores, office buildings, courthouses, and schools.

[4] These fatalities occurred primarily to repair or maintenance workers or to police while on duty.

[5] Includes children's home, dormitory, hospital, jail nursing home, and reform school.

NOTE: Totals for major categories may include subcategories not shown separately. Percentages may not add to totals because of rounding. Dashes indicate no data reported or data that do not meet publication criteria..

n.e.c. = not elsewhere classified.

SOURCE: Census of Fatal Occupational Injuries, 1993.

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States from Federal agencies, such as the Department of Labor's Occupational Safety and Health Administration, Employment Standards Administration, and Mine Safety and Health Administration. Overall, in 1993, State agencies collected approximately 20,000 individual source documents, or an average of about three documents from different sources for each fatality case. (See table 6.) To avoid duplication, source documents are matched using the decedent's name and other information.

To ensure an accurate count of fatal occupational injuries, the census program requires that for each case, the work relationship (that is, whether a fatality is work related) be substantiated by two or more independent source documents or a source document and a followup questionnaire. Followup questionnaires are sent to the employer or to another contact that has knowledge of the incident. The followup questionnaire also is used to collect information missing from the source documents. Nonresponse to the questionnaire or inconsistent data results in further followup by telephone.

At the conclusion of the collection period, fatalities for which the State has only one source document are reviewed by BLS. The fatality is included in the national data base only if the State and BLS agree that there is sufficient information on the source document to determine that the fatality is work related. (See the appendix for an explanation of how cases with only one source document are processed.)

For a fatality to be considered within the scope of the program, the decedent must have been employed (working for pay, compensation, or profit or in the family business) at the time of the event and engaged in a legal work activity[7] or present at the site of the incident as a job requirement. This definition allows all injury-related[8] fatalities that occur while a person is in a work status to be included in the census; it is generally broader than the criteria used by Federal and State agencies administering specific laws or regulations.

Partial information on fatal occupational illnesses (nontraumatic conditions such as asbestosis and occupational cancers) is being compiled primarily from State workers' compensation reports. Because of the latency period of many occupational illnesses and the difficulty associated with linking illnesses to work, it is not possible to compile a complete count of all fatal illnesses in a particular year. Thus, information on illness-related deaths is excluded from this article.[9]

Safety and health researchers, policy officials, and others involved in promoting safety in the workplace may examine a research file made available to them through a letter of agreement with BLS to protect the confidentiality of data sources.[10] Because census data are collected under a pledge of confidentiality, data that identify the deceased or the company are deleted from the data base.

Background. The BLS census counts and verifies all fatal work injuries, providing detailed information about how the injury occurred, the machinery and equipment involved, and demographic characteristics of the fatally injured worker (for example, age, gender, and race). The development of the Census of Fatal Occupational Injuries program included several years of testing before it was begun in the 50 States and the District of Columbia in 1992. Information from the first national census was published in the October 1993 issue of the *Monthly Labor Review*.[11]

The development of the BLS census was a result of recommendations in 1987 by the National Academy of Sciences[12] and other safety and health organizations that emphasized the need to obtain detailed characteristics on fatal workplace injuries on a timely basis to develop and put in place effective safety measures. The recommendations included using multiple data sources such as death certificates and workers'

Table 6. **Source documents used to compile information on fatal work injuries, 1993**

Source document	Fatalities	
	Number	Percent
Total[1]	6,271	100
Death certificates	4,409	78
State workers' compensation reports	2,244	36
Coroner, medical examiner, and autopsy reports	3,195	51
Occupational Safety and Health Administration (OSHA) reports[2]	1,840	29
News media	2,332	37
Followup questionnaires[3]	1,310	21
State motor vehicle reports	332	5
Other Federal reports[4]	283	5
Other reports[5]	3,775	61

[1] The total number of source documents exceeds the total of verified cases because two or more source documents were used to substantiate each case. Some source documents were received only upon request. In general, these included autopsy, coroner, and medical examiner reports; followup questionnaires; and State motor vehicle reports. The number of death certificates shown are those received through "formal arrangements" and marked "at work."

[2] This figure is not a comprehensive count of fatalities reported to, or investigated by, OSHA, but represents the available OSHA reports used to identify or substantiate a work injury fatality in the Census of Fatal Occupational Injuries program.

[3] Includes telephone followup for missing data and clarifying inconsistent data.

[4] Includes reports received from the Mine Safety and Health Administration, Employment Standards Administration, National Institute for Occupational Safety and Health's Fatal Accident Circumstances and Epidemiology program, Department of Justice, Department of Energy, and National Transportation Safety Board.

[5] Includes reports received from other organizations, such as State farm bureaus, local police departments, emergency medical services, and the National Association of Chiefs of Police.

SOURCE: Census of Fatal Occupational Injuries, 1993.

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compensation reports to identify and profile fatal work injuries for all workers, including the self-employed.

The Keystone Dialogue Group further recommended developing a "consensus method" to count work-related fatalities.[13] The group stated that the "development of an accepted count of workplace deaths should mute controversy on this issue stemming from the variety of estimates coming from different sources." In this regard, fatality estimates made by various organizations at that time varied greatly from 3,000 to 11,000 deaths nationally per year.[14]

The census approach to compiling data on fatal work injuries was first tested in a BLS cooperative effort with the Texas Department of Health in 1988.[15] This approach was tested again in Texas and Colorado in 1990 to determine whether the same kind of data could be obtained from multiple data sources on a current basis.[16] In 1991, the Census of Fatal Occupational Injuries was initially begun in 32 States and New York City. In 1992, the census covered the 50 States and the District of Columbia.[17]

Footnotes

ACKNOWLEDGMENTS: Martin E. Personick, an economist in the Office of Safety, Health and Working Conditions, Bureau of Labor Statistics, assisted in the preparation of this article. BLS thanks the participating States for their efforts in achieving the objectives of this program: to collect and publish data on fatal work injuries that are timely, accurate, comprehensive, and useful for injury prevention. BLS also appreciates the efforts of all State and Federal agencies that submitted source documents used to identify fatal work injuries. Among these agencies are the Occupational Safety and Health Administration; National Transportation Safety Board; Department of Justice (Bureau of Justice Assistance); Mine Safety and Health Administration; Centers for Disease Control and Prevention; National Institute for Occupational Safety and Health; Employment Standards Administration (Federal Employees' Compensation and Longshore and Harbor Workers' divisions); Department of Energy; National Association of Chiefs of Police; State vital statistics registrars, coroners, and medical examiners; State departments of health, labor, and industries, and workers' compensation agencies; State highway departments; and State farm bureaus.

[1] Transportation-related incidents include fatalities involving land (either on or off the highway), air, water, or rail transport. It includes injuries to occupants of vehicles and to pedestrians or other nonpassengers. Assaults and violent acts include homicides, self-inflicted injuries, and attacks by animals.

[2] Highway fatalities include deaths to vehicle occupants resulting from traffic incidents occurring on the public roadway, shoulder, or surrounding area. They exclude incidents occurring entirely off the roadway, such as in parking lots, on industrial premises, and on farms; incidents involving trains; and deaths to pedestrians or other nonpassengers.

[3] Homicide is generally defined as the intentional taking of another's life or killing another while committing a crime.

[4] Mark Purschwitz and John Shutske, "Agricultural Injury Denominator Data." Paper presented at the American Society of Agricultural Engineers meeting, Spokane, WA, June 1993.

[5] Statements made by U.S. Secretary of Labor Robert B. Reich and Acting Commissioner of Labor Statistics William Barron at the first national Census of Fatal Occupational Injuries news conference, Washington, Oct. 1, 1993.

[6] Scott J. N. McNabb, Centers for Disease Control and Prevention, presentation at the CFOI national conference, Washington, Sept. 9, 1992.

[7] Work is defined as duties, activities, or tasks that produce a product or result, that are done in exchange for money, goods, services, profit, or benefit; and that are legal activities in the United States. Fatalities that occur while a person is commuting to and from work are excluded from the counts in the Census of Fatal Occupational Injuries.

[8] A traumatic injury is defined as any unintentional or intentional wound or damage to the body resulting from acute exposure to energy—such as heat or electricity or kinetic energy from a crash—or from the absence of such essentials as heat or oxygen caused by a specific event, incident, or series of events within a single workday or shift. Included are open wounds, intracranial and internal injuries, heatstroke, hypothermia, asphyxiation, acute poisoning resulting from a short-term exposure (limited to the worker's shift), suicide and homicide, and work injuries listed as underlying or contributory cause of death.

[9] A total of 1,466 fatal occupational illness cases were collected and coded in 1993. These cases were primarily heart attacks that occurred at work. For a more complete discussion of the difficulties involved in capturing information on occupational illnesses, both fatal and nonfatal, see Harvey J. Hilaski, "Understanding statistics on occupational illnesses," *Monthly Labor Review*, March 1981, pp. 25–29.

[10] The 1992 Census of Fatal Occupational Injuries research file is available on diskette upon request. The 1993 research file will be available in February 1995. For information on obtaining an application form to request the research file, contact Guy Toscano at (202) 606–6175.

[11] Guy A. Toscano and Janice Windau, "Fatal work injuries from the 1992 national census," *Monthly Labor Review*, October 1993, pp. 39–48.

[12] *Counting Injuries and Illnesses in the Workplace: Proposals for a Better System* (National Research Council, National Academy Press, 1987).

[13] "Keystone National Policy Dialogue on Work-Related Illness and Injury Recordkeeping," final paper of Keystone Center, January 1989.

[14] The BLS Survey of Occupational Injuries and Illnesses estimated that 2,900 work-related fatalities occurred in 1990. For the same year, the National Safety Council estimated 10,500 work-related fatalities. The National Institute for Occupational Safety and Health's National Traumatic Occupational Fatality program estimated 5,700 work-related deaths for 1989, the latest year for which data from that program are available.

The BLS survey produces national estimates of nonfatal occupational injuries and illnesses from a sample of about 280,000 private sector establishments. Estimates of occupational fatalities derived from the survey data were lower than other estimates due to the exclusion of various workers from survey coverage: the self-employed, public sector employees, and employees of private households. The estimates from the survey also excluded fatalities for workers in establishments with fewer than 11 employees. Deriving figures for occupational fatalities—a relatively rare event—from a sample survey is believed to play a part in the low figures. See *Occupational Injuries and Illnesses in the*

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United States by Industry, 1990, Bulletin 2399 (Bureau of Labor Statistics, April 1992).

National Safety Council estimates cover unintentional injury-related deaths of persons in the civilian work force, 14 years and older, except for private household workers. (Homicides and suicides are excluded.) See *Accident Facts: 1991 Edition* (National Safety Council, 1991).

The National Institute for Occupational Safety and Heath estimates cover traumatic injuries (intentional and unintentional) of persons 16 years and older identified on the death certificate as occurring at work. Death certificates cover all deaths occurring in the State, but only those death certificates identifying a fatal injury as one that occurred at work are used to compile the number of fatal occupational injuries. Some fatal work injuries, particularly those resulting from motor vehicle accidents, may not be considered work related by persons completing the death certificate. See *National Traumatic Occupational Fatalities: 1980–1985* (National Institute for Occupational Safety and Health, March 1989).

State and Federal workers' compensation reports also fail to capture a census of fatal occupational injuries. The self-employed, employees of small farms, private households, and railroads and seasonal employees are generally excluded from workers' compensation coverage. See Nancy Stout and Catherine Bell, "Effectiveness of Source Documents for Identifying Fatal Occupational Injuries: A Synthesis of Studies," *American Journal of Public Health*, June 1991, pp. 725–28.

[15] The study, which collected fatality data retrospectively for 1986, showed that (1) multiple data sources, including, at times, a followup questionnaire, are needed to produce a comprehensive and accurate count of fatal occupational injuries; (2) matching individual fatalities across data sources is feasible; (3) for each incident, characteristics of the worker and circumstances are commonly available from various administrative reports; and (4) timeliness is important in maximizing respondents' recall to verify information and reduce the number of those who fail to respond because they have relocated. See Janice Windau and Donna Goodrich, "Testing a census approach to compiling data on fatal work injuries," *Monthly Labor Review*, December 1990, pp. 47–49.

[16] This study, which was conducted in cooperation with the Texas Workers' Compensation Commission and the Colorado Department of Health, was successfully concluded on May 1, 1991. The test also confirmed the importance of using multiple data sources, because no single system captures all fatal work injuries. See Guy Toscano and Janice Windau, "Further testing of a census approach to compiling data on fatal work injuries," *Monthly Labor Review*, October 1991, pp. 33–36.

[17] *Fatal Workplace Injuries in 1992: A Collection of Data and Analysis*, Report 870 (Bureau of Labor Statistics, April 1993).

APPENDIX: Measurement techniques and limits

Identification and verification of work-related fatalities. Because some State laws and regulations prohibit enumerators from contacting the next of kin, it was not possible to independently verify work relationship (whether a fatality is job related) for 277 fatal work injuries in 1993; however, the information on the initiating source document for these cases was sufficient to determine that the circumstances of the incident were likely to be job related. Data for these fatalities, which primarily affected self-employed workers, are included in the Census of Fatal Occupational Injuries counts. An additional 49 fatalities submitted by States were not included because the initiating source document had insufficient information to determine work relationship, which could not be verified by an independent source document or a followup questionnaire.

States may identify additional fatal work injuries after data collection ends for a reference year. In addition, other fatalities excluded from the published count because of insufficient information to determine work relationship may be subsequently verified as work related. States, therefore, have up to 1 year to update their initial published counts. This procedure ensures that fatality data are disseminated as quickly as possible and that legitimate cases are not excluded from the counts. As data collection methods improve, future fatal work injury counts may become more complete.

The BLS fatality data reported 6,083 fatal work injuries in calendar year 1992. As a result of the procedure to update the previous year's counts, an additional 134 job-related fatalities have been identified, bringing the total job-related fatality count for 1992 to 6,217. The revised tables for 1992, with more detailed 1993 data, will be included in a forthcoming comprehensive report.

Federal/State agency coverage. The Census of Fatal Occupational Injuries includes data for all fatal work injuries, whether they are covered by the Occupational Safety and Health Administration (OSHA) or other Federal or State agencies, or are outside the scope of regulatory coverage. Any comparison between the BLS census counts and those released by other agencies should take into account the different coverage and definitions being used.

Several Federal and State agencies have jurisdiction over workplace safety and health. OSHA and affiliated agencies in States with approved safety programs cover the largest portion of U.S. workers. However, injuries and illnesses occurring in several other industries, such as coal, metal and nonmetal mining, and transportation on water, rails, or in the air, are excluded from OSHA coverage because they are covered by other Federal agencies, such as the Mine Safety and Health Administration, the U.S. Coast Guard, the Federal Railroad Administration, and the Federal Aviation Administration. Fatalities occurring in industries regulated by Federal agencies other than OSHA accounted for about 11 percent of the fatal work injuries in 1993.

Fatalities occurring among several other groups of workers are generally not covered by any Federal or State agencies. These groups include self-employed and unpaid family workers, which accounted for about 21 percent of fatalities; laborers on small farms, accounting for about 5 percent of fatalities; and State and local government employees in States without OSHA-approved safety programs, about 4 percent. (About one-half of the States have approved OSHA safety programs that cover State and local government employees.)

Experimental fatality rates. When comparable employment data or exposure hours are available, injury

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fatality rates can be calculated to examine risk. Rates are generally calculated for occupations, industry groups, or demographic characteristics such as age and gender to determine the risk of injury in specific employment groups compared with others.

A fatal work injury incidence rate represents the number of persons in a worker group who sustain a fatal work injury divided by the total number at risk per unit of time. Fatality rates may be calculated differently to measure the incidence of a fatal work injury for groups of workers. An hours-based rate would measure the fatality risk per standardized length of exposure; an employment-based rate measures the fatality risk for those employed in a particular period. A fatality rate can be produced for a group of workers, for example, by hours of exposure or for those employed during a particular day, week, month, or year.

Each type of rate has a different purpose. An employment-based fatality rate measures the incidence of a fatal injury for all workers in the group, regardless of exposure time. It does not account for fewer fatalities among part-time workers than for full-time workers because of their reduced hours exposed to the work environment. An hours-based fatality rate accounts for the different exposure durations among workers. Hours-based measurements are especially useful in industry and occupational comparisons in which the number of workers at risk can vary greatly among industry or occupational groups for a particular period.

Fatality counts from the Census of Fatal Occupational Injuries can be combined with information on employment or hours at work to produce a fatal work injury rate. Because neither hours at work nor number of persons employed are collected in the BLS census, the fatality rates in the tables were calculated using the employment estimates from the Current Population Survey (CPS)—a household survey conducted for the Bureau of Labor Statistics by the Bureau of the Census. The CPS annual average employment estimates are based on the number of workers employed during the week which includes the 12th day of each month.

The fatality rates in the tables presented in this article relate the total number of workplace deaths in 1993 to the average number of workers facing that risk for various groups. These measurements are developmental and do not reflect the movement of persons into and out of the labor force, the length of their workweek or workyear, or the effect of multiple jobholders. BLS will continue its research on fatality rates by exposure hours and by employment.

The rates shown in the tables were calculated as follows:

$$(N/W) \times 100{,}000,$$

where:

N = the number of fatally injured workers in a particular group (for example, the construction industry) and,

W = the annual average number of workers employed in that group (the employment is an annual average of employed civilian workers 16 years of age and older, plus resident Armed Forces, from the Current Population Survey, 1993).

The ratio N/W is multiplied by 100,000; the rate is expressed as a whole number and represents the number of fatal work injuries per 100,000 workers.

Adjustments were made to N to maintain consistency with the CPS employment W, which excludes workers under 16 years of age. There were 29 total fatalities of workers under the age of 16 that were not included in the fatality rate calculations. The following is an illustration:

Work fatalities totaled 6,271 in 1993. Total annual average employment in 1993 was 120,791,000 workers (119,306,000 civilian workers 16 years of age and older and 1,485,000 resident Armed Forces). N must be adjusted to be consistent with W, because 29 fatally injured workers were under the age of 16 years. So,

$$N = 6{,}271 - 29 = 6{,}242, \text{ and}$$
$$W = 120{,}791{,}000.$$

$$\text{Therefore, } (6{,}242/120{,}791{,}000) \times 100{,}000 = 5,$$
$$\text{or 5 fatalities per 100,000 workers.}$$

(Note that adjustments of N are not reflected in the "Number" and "Percent" columns in the tables of this article, which include all fatalities regardless of age.)

The CPS employment data used to calculate rates are estimates that are based upon a sample of persons employed rather than a complete count. Therefore, the employment estimates and fatality rates have sampling errors; that is, they may differ from figures that would have been obtained if it had been possible to take a complete census of employed persons. See "Explanatory Notes on Household Data" in the January 1993 issue of the BLS monthly periodical, *Employment and Earnings*, for an explanation of CPS sampling and estimation procedures and standard error tables. Because the relative sampling error of a fatality rate is approximately equal to the relative sampling error of the CPS employment used in the calculation of the rate, the sampling error tables can be used for constructing confidence intervals for the CPS employment and the fatality rates.

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A Relative Risk Analysis of Workplace Fatalities

John W. Ruser

The Census of Fatal Occupational Injuries (CFOI) collects information on the number of fatalities sustained by different types of workers. Using multiple data sources, such as death certificates, workers' compensation reports and claims, Occupational Safety and Health Administration reports, and other Federal and State records, CFOI attempts to collect information on all fatal occupational injuries that occur each year. CFOI analysts verify the work relationship for each fatality using at least two independent sources. In 1992, an average of 3 documents was collected for each fatality. For a fatality to be considered within the scope of the CFOI, the decedent must have been employed at the time of the event, and engaged in a legal work activity or present, as a requirement of employment, at the site of the incident. Besides private wage and salary workers, the annual census includes fatalities of public sector employees—both civilian and military—and the self-employed. For the present study, military fatalities were excluded from the analysis.

Although CFOI counts are informative in identifying worker groups that experience large numbers of fatalities, they do not by themselves measure risk. To quantify risk, the data on workplace fatalities must be associated with a measure of worker exposure to risk, such as employment or hours worked. The number of hours worked is preferable because different workers spend variable hours on the job in a given time period (e.g. year), and therefore have different lengths of exposure to workplace hazards.

Two related measures of risk can be calculated with data on fatalities and hours worked. The rate of workplace fatal injuries (or injury mortality rate) is calculated by dividing the number of fatalities in a given time period by the number of hours worked in that same period. This equation yields the number of fatalities occurring per hour worked.

$$\text{Rate} = \frac{\text{Fatalities}}{\text{Hours worked}} \quad \text{during same time period}$$

Alternatively, an index of relative risk can be calculated for a group of workers as the ratio of the rate for that group to the rate for all workers.

$$\text{Index of relative risk} = \frac{\text{Mortality rate for a given group}}{\text{Mortality rate for all workers}}$$

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This second statistic measures how much the mortality risk of the group differs from that of all workers.[1]

In this article, indexes of the relative risk of injury fatalities are calculated for different groups of workers to identify those at greatest risk. The fatality data come from the 1992 and 1993 CFOIs and measure the number of workers who died in 1992 or 1993 as the result of a workplace injury that occurred in 1992.[2] Estimates of annual hours worked were calculated using microdata from the 1992 Current Population Surveys.

Fatal injury risk by major occupational group and sex

Table 1 presents data by sex on the relative risk of death for all civilian workers in different occupational groups. The indexes are expressed in relation to the index of relative risk for all civilian occupations, with the given value of 1.0. All indexes within the table can be compared.The rate of fatalities for all occupations is about 5.2 deaths per 100,000 workers.

Women have a low relative risk of workplace fatalities. Men are about eight times more likely than women to be killed by a workplace injury ($1.6 \div 0.2 = 7$). Further, whereas in some occupational groups, women are more likely than men to sustain a nonfatal injury or illness, this is never the case for fatalities.[3] Even within detailed occupations, women generally have lower fatality risks than men. Because there are relatively few fatalities reported for women in the CFOI data base, some of the analyses in the following pages do not present fatality risks separately for women and men.

As expected, white-collar occupations have relative risks below 1, meaning these occupations are safer than average.

[1] For an example of a previous use of this index see Shail J. Butani, "Relative Risk Analysis of Injuries in Coal Mining by Age and Experience at Present Company," *Journal of Occupational Accidents* 10 (1988).

[2] A small number of injuries that occurred in 1992 will give rise to fatalities in 1994 and future years that are not yet known and cannot be included in the analysis. The 1992 CFOI data also include some fatalities that resulted from injuries occurring in previous years. These fatalities are not included in the analysis because measures of relative risk are constructed by using hours of exposure to risk that are contemporaneous with the occurrence of injuries. Hours of exposure for 1992 should be compared to counts of fatalities that were due to injuries that occurred in 1992.

[3] For information about the relative risks for nonfatal injuries and illnesses, see U.S. Department of Labor, *Report on the American Workforce*, Washington, DC (1994).

Table 1. Index of relative risk for occupational fatalities resulting from 1992 injuries, by occupation and sex, all civilian workers 15 years and over.

Occupation	Index of relative risk		
	Total	Men	Women
All civilian occupations	1.0	1.6	0.2
Managerial and professional specialty	.4	.6	.1
Executive, administrative and managerial	.5	.7	.2
Professional specialty	.3	.5	.1
Technical, sales and administrative support	.5	.9	.1
Technicians and related support	.9	1.6	.1
Sales occupations	.7	1.0	.3
Administrative support, including clerical	.1	.3	.1
Service occupations	.8	1.4	.2
Protective service	2.4	2.7	.8
Service occupations, except protective service	.4	.8	.2
Farming, forestry and fishing occupations	4.7	5.4	.5
Farming and related agricultural occupations	3.6	4.2	.5
Forestry, logging, fishing, and hunting	28.1	29.3	2.6
Precision production, craft and repair	1.5	1.6	.2
Mechanics and repairers	1.1	1.1	.7
Construction trades	2.4	2.4	1.3
Extractive occupations	10.3	10.2	-
Precision production occupations	.6	.8	0
Operators, fabricators, and laborers	2.2	2.7	.3
Machine operators, assemblers, and inspectors	.6	.9	.1
Transportation and material moving occupations	4.1	4.3	1.6
Handlers, equipment cleaners, helpers and laborers	2.6	3.1	.5

NOTE: Dashes indicate that data do not meet publication guidelines.

SOURCE: BLS Census of Fatal Occupational Injuries, 1992 and 1993, and Current Population Survey, 1992.

The safest occupational classification is administrative support occupations, including clerical, with a fatality risk only one-tenth of the overall average. Blue-collar and service workers have relative risks that vary widely. Workers in the forestry, logging, fishing, and hunting occupations have relative risks that are about 28 times higher than for the typical worker. Another high risk occupational group is the extractive occupations, such as oil drilling and coal mining. Blue-collar occupations, such as precision production workers, and machine operators, assemblers and inspectors, have fatality risks below the overall average.

Fatal injury risk for detailed occupations

The table in the previous section presents data only at a highly aggregated level, masking the identity of specific high risk occupations. Table 2 identifies 13 detailed occupations that had indexes of relative risk of fatality greater than or equal to 4.0. Because of the small number of fatalities to women, the data are not separated by sex. In order to isolate occupations that are relatively large or have relatively large numbers of fatalities, the table is limited to those occupations with annual average employment in excess of 100,000 or with more than 50 fatalities.

Table 2. Index of relative risk and number of occupational fatalities resulting from 1992 injuries, selected high risk occupations, all civilian workers 15 years and over (Index for all workers = 1.0)

Occupation	Index of relative risk	Number of fatalities	Major deadly event
Timber cutting and logging	36.5	131	struck by falling tree
Civilian airline pilots and navigators	24.1	120	airplane crash
Fishers	23.7	71	drowning
Supervisors, farm workers	20.3	55	tractor accident
Taxicab drivers and chauffeurs	9.4	105	homicide
Managers, farms, except horticultural	7.8	68	varied
Construction laborers	7.2	225	varied
Electrical power installers and repairers	6.1	36	electrocution
Roofers	5.9	49	fall
Sheriffs, bailiffs, and other law enforcement officers[1]	5.7	34	homicide, highway accident
Truck drivers	4.5	691	highway accident
Driver-sales workers	4.2	46	highway accident
Farm workers	4.0	195	varied

[1] Police officers and detectives are a separate occupation category and, as such, are not included here.

NOTE: Included in this list are occupations that meet the following criteria: employment of at least 100,000 or 50 or more fatalities; an index of relative risk 4.0 or above; and not designated as "not specified" or "not elsewhere classified."

SOURCE: BLS Census of Fatal Occupational Injuries, 1992 and 1993, and Current Population Survey, 1992.

The occupations in table 2 appear to be dispersed among widely varying occupational groups. However, they have a common element: these are jobs where people work outdoors, rather than on factory floors. Manufacturing sites, in fact, have relatively low rates of fatal work injuries, in contrast to relatively high rates for nonfatal injuries and illnesses.

The occupation with the highest index of relative risk is timber cutting and logging. These workers, who are over 36 times more likely to be killed on the job than the average worker, are typically killed by falling trees. Truck drivers, however, have the largest number of fatalities, most of these arising from highway accidents.

Three agricultural occupations appear in table 2 and a fourth fell just short of inclusion. Fatalities in farming occupations are not the result of one kind of incident; work-

ers are fatally injured in a number of ways including tractor rollovers and collisions, and being caught in farm machinery.

Age and workplace fatalities

The risk of a fatal occupational injury is far greater for employees over the age of 64 than it is for younger workers (see table 3). A man 65 or older is nearly four times more likely to die of a workplace injury than a man between the ages of 25 and 34. Similarly, a woman over 64 is much more likely to be killed than her 25 to 34 year old colleague.

Table 3. Index of relative risk for occupational fatalities resulting from 1992 injuries by age and sex, all civilian workers

Age group	Total	Men	Women
All ages, 15 years and over	1.0	1.6	0.2
15 to 19	.8	1.4	.1
20 to 24	.9	1.4	.2
25 to 34	.9	1.4	.2
35 to 44	.9	1.4	.2
45 to 54	1.0	1.6	.2
55 to 64	1.4	2.1	.2
65 and over	3.5	5.3	.5

SOURCE: BLS Census of Fatal Occupational Injuries, 1992 and 1993, and Current Population Survey, 1992.

A study of the events leading to fatalities suggests that the relative risks of many types of events jump for the oldest group of workers. Compared to men between 25 and 34 years of age, men over 64 are about 5 times more likely to have a fatal transportation accident, over 4.5 times more likely to die from a fall, 3.8 times more likely to die from contact with objects and equipment, and 3.4 times more likely to die from assault. Thus, no single event is responsible for the increased risk for those over 64. Older workers also seem to have an elevated risk of death from injury within detailed occupations. Differences in the occupations of the young and old do not seem to explain the finding. One possible explanation is that older workers simply are less likely to survive when they are severely injured.

Compared to the jump in fatality risk for those over 64, other variations in risk with age are either relatively small or essentially non-existent. The fatality risk does not vary with age for women younger than 65, and the risk is only slightly higher for men 55 to 64 years of age than it is for younger men.

Events leading to fatal occupational injuries

In 1992, transportation accidents were the event most often associated with fatal occupational injuries to men, accounting for 39 percent of their workplace deaths. (See table 4.) The second leading event for men was assaults and other violent acts. For women, assaults were the leading event associated with fatal occupational injuries (45 percent), followed closely by transportation-related events (38 percent). This section examines more closely these two events.

Table 4. Events in 1992 leading to fatal occupational injuries by sex, all civilian workers

Event	Total	Men	Women
Total	5,993	5,560	433
Transportation accidents[1]	2,347	2,183	164
Assaults and violent acts	1,264	1,070	194
Contact with objects and equipment	981	964	17
Exposure to harmful substances or environments	593	577	16
Falls	574	546	28
All other events	234	220	14

[1] Includes highway, nonhighway, air, water, rail and pedestrian accidents.

SOURCE: BLS Census of Fatal Occupational Injuries, 1992 and 1993.

Transportation accidents. Highway accidents in 1992 accounted for almost half of all transportation accidents leading to fatal work injuries for all civilian workers. (See table 5.) There were also a significant number of transportation accidents that occurred at industrial sites and farms. Further, a significant number of pedestrians were struck by vehicles and other mobile equipment.

Table 5. Transportation accidents in 1992 causing fatal occupational injuries, all civilian workers

Transportation accidents	Number	Percent
Total	2,347	100
Highway accidents	1,133	48
Nonhighway accidents, exc. rail, air, and water	425	18
Pedestrian struck by vehicle or mobile equipment	344	15
Aircraft accidents		
Water vehicle accidents	103	4

SOURCE: BLS Census of Fatal Occupational Injuries, 1992 and 1993.

Indexes of relative risk can be calculated by occupation for each type of accident. For example, if the risk of a fatal highway accident for the average worker is 1.0, then, it is possible to calculate the index of relative risk of a highway accident for a truck driver or for a worker of any other occupation. The index would give the relative risk per an hour worked, not per an hour in a vehicle. Because some workers spend more of their time engaged in transportation activities, they are more likely to be killed in transportation accidents.

Table 6 lists the 10 occupations with annual employment in excess of 100,000 that had the highest risk of a 1992 work-related highway fatality. Not surprisingly, three

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of the four riskiest occupations are in the group entitled "motor vehicle operators." Truck drivers had, by far, the largest number of highway-related fatalities. Law enforcement and farming occupations also appear in the list. Additionally, occupations that have employment in excess of 100,000 and are not designated "not elsewhere classified" or "not specified" are included as well.

Table 6. Large occupational groups with the highest risk of fatal work-related highway accidents, all civilian workers 15 years and over, in 1992

Occupation	Index of relative risk	Number of fatalities
All civilian workers	1.0	1,131
Driver-sales worker	15.5	32
Truck drivers	13.7	396
Sheriffs, bailiffs and other law enforcement officers	8.9	10
Taxicab drivers and chauffeurs	7.1	15
Messengers	6.9	8
News vendors	6.9	5
Police and detectives, public service	5.0	25
Managers, farms, excl. horticultural	4.9	8
Farm workers	3.2	29
Operating engineers	3.1	6

NOTE: Included in this list are occupations that meet the following criteria: employment of at least 100,000 or 50 or more fatalities; an index of relative risk 4.0 or above; and not designated as "not specified" or "not elsewhere classified."

SOURCE: BLS Census of Fatal Occupational Injuries, 1992 and 1993, and Current Population Survey, 1992.

Similarly, table 7 shows large occupational groups with the highest risk of a work-related nonhighway transportation fatality, excluding air, rail, or water transportation accidents, and those involving pedestrians. The occupations

Table 7. Large occupational groups with the highest risk of fatal work-related nonhighway transportation accidents, excluding air, rail, water and pedestrian accidents, all civilian workers 15 years and over, in 1992

Occupation	Index of relative risk	Number of fatalities
All civilian workers	1.0	421
Managers, farms, excl. horticultural	31.1	19
Farmers, excl. horticultural	20.6	103
Farm workers	17.3	59
Excavating and loading machine operators	9.4	4
Industrial truck and tractor equipment operators	8.6	14
Operating engineers	8.4	6
Truck drivers	4.3	46
Laborers, except construction	4.1	17

NOTE: Included in this list are occupations that meet the following criteria: employment of at least 100,000 or 50 or more fatalities; an index of relative risk 4.0 or above; and not designated as "not specified" or "not elsewhere classified."

SOURCE: BLS Census of Fatal Occupational Injuries, 1992 and1993, and Current Population Survey, 1992,

with the highest incidences of workplace fatalities, accounting for 43 percent of all fatalities in this category, were farming occupations. These workers were often killed whileoperating tractors. The next three occupations in the table are engaged in operating material moving equipment, such as forklifts and excavating equipment.

In addition to occupation, age is often associated with the risk of work-related highway fatalities. Using the age of all workers killed in traffic incidents distorts the analysis, because some workers who die are passengers. When studying the effect of o=-age on highway fatality, it is more appropriate to use the of vehicle operators. However, CFOI routinely collects age data only for the deceased. Also, data may not be available on the proportion of a worker's time that is spent operating a vehicle. However, these data problems can be minimized to a large extent by focusing only on motor vehicle operators. The CFOI data indicate that, for highway accidents in this occupational group, the deceased was operating the vehicle over 94 percent of the time. Further, workers in this group tend to spend most of their working hours driving.

Table 8 shows how the relative risk of a work-related highway fatality varies by age for motor vehicle operators age 16 and over. Motor vehicle operators have a risk of a highway fatality that is nearly 12 times that of the average civilian worker. Motor vehicle operators age 65 and older are three times more likely to die from a highway accident than the average motor vehicle operator. The fatality risk for a motor vehicle operator between 16 and 19 years old is about the same as that of those 55 to 64 years old.

Assaults and violent acts. The large majority, 82 percent, of all assaults and violent acts are homicides.[5] While workplace homicides caused by disputes between clients, coworkers and spouses often make the news, research indicates that they only account for about 13 percent of all workplace homicides. In contrast, robberies and miscellaneous

Table 8. Index of relative risk and number of work-related highway fatalities for motor vehicle operators 16 years and over, by age, 1992

Age group	Index of relative risk	Number of fatalities
All civilian workers	1.0	1,128
Motor vehicle operators	11.7	453
16 to 19	15.1	9
20 to 24	8.8	25
25 to 34	9.0	101
35 to 44	12.4	135
45 to 54	11.9	93
55 to 64	16.0	62
65 and older	36.4	28

SOURCE: BLS Census of Fatal Occupational Injuries, 1992 and 1993, and Current Population Survey, 1992.

[5] The assaults and violent acts category also includes self-inflicted fatalities and those caused by animals.

crimes are responsible for over 80 percent of workplace homicides.[6]

Taxicab drivers have the highest risk of a workplace homicide (per hour worked), with an index of relative risk of homicide that is over 44 times higher than for the average worker. (See table 9.) Law enforcement occupations and workers engaged in retail sales also have especially high risks of workplace homicide.

Conclusions

Combining CFOI data with data from other sources helps to identify those who are at the highest risk of workplace fatality. The occupational group that includes loggers and fishers has a very high fatality risk, followed by employees in the extractive occupations. A characteristic of many of the high fatality risk jobs is that much of the work is performed outside.

Workers over the age of 64 have an especially elevated risk of death as compared to younger workers. This is true in the aggregate and also within detailed occupations. There is no single type of fatality that an older worker is more likely to suffer. Rather, workers over 64 are more likely to have a transportation accident and to die from a fall, assault, or contact with an object. An explanation for older workers' higher incidence of workplace fatalities is that they are less likely to survive severe injuries.

Transportation accidents are by far the most common event leading to a fatal occupational injury for men and the second leading factor for women. Not surprisingly, driver-sales workers and truck drivers have the highest risk of suffering a fatal accident on the highway. Farmers have the highest risk of a fatal transportation accident off the highway, often in accidents involving tractors. Motor vehicle operators over 64 are three times more likely to die from a highway accident than the average motor vehicle operator.

Assaults and violent acts are the leading event associated with workplace fatalities for women and the second leading event for men. Over 80 percent of workplace homicides occur during robberies or other crimes, while only about 13 percent arise from disputes between coworkers, clients, and spouses.

Table 9. Occupations with the highest risk of work-related homicide in 1992, all civilian workers 15 years and over.

Occupation	Index of relative risk	Number of fatalities
All civilian employees	1.0	1034
Taxicab drivers and chauffeurs	44.6	86
Sheriffs, bailiffs, and other law enforcement officers	18.4	19
Garage and service station related occupations	10.8	18
Sales counter clerks	9.2	14
Guards and police, excl. public service	8.4	53
Police and detectives, public service	7.4	34
Driver-sales workers	6.3	12
Food counter, fountain, and related occupations	5.6	10
Managers, food serving and lodging establishments	4.8	61
Cashiers	4.6	77

NOTE; Included in this list are occupations that meet the following criteria: employment of at least 100,000 .

SOURCE: BLS Census of Fatal Occupational Injuries, 1992 and 1993, and Current Population Survey, 1992.

[6] Janice Windau and Guy Toscano, "Workplace Homicides in 1992," in *Fatal Workplace Injuries in 1992: A Collection of Data and Analysis*, BLS Report 870, May 1994.

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"operator, fabricator, and laborer," each about a fifth of the totals for older and prime age workers. Most of the remaining fourth for each age group was split about evenly between "service" and "precision production, craft, and repair."

Within these broad occupational groupings were four categories each employing one million older workers or more: (1) Executive, administrative, and managerial jobs; (2) sales occupations; (3) administrative support jobs, including clerical; and (4) service occupations, other than protective services. Additionally, four occupations employed at least a quarter million older workers: Sales workers in retail and personal services, secretaries, janitors and cleaners, and truck drivers. Many of these jobs and job categories also appear in table 1 as occupations commonly cited when older workers sustained serious, nonfatal injuries and illnesses.

Injuries to older workers

About 168,700 injuries and illnesses to workers aged 55 years and over were serious enough to require some time away from work, beyond the day of injury or onset of illness. Seven-eighths of these cases involved workers aged 55 to 64 years and the balance, 65 years and over.

The risk of serious, nonfatal injury and illness was lower for older workers than their share of the total work force would suggest. Workers, aged 55 years and over accounted for 7 percent of the 2.3 million cases with days away from work. However, these workers accounted for about 10 percent of all private wage and salary workers. The relative risk was lowest for the oldest of the old, those 65 years and over; they comprised 1 percent of the injury and illness total and 2 percent of all workers.

Although men make up a clear majority of injuries to workers, aged 55 years and over, women have a somewhat larger share (39 percent) of that total than their share of the national case total (33 percent). As suggested earlier, both groups of women, those under age 55 and those over age 54, comprised about 46 percent of the work forces in their respective age groups. Therefore, the difference in the risk of injury and illness for older men and older women was small relative to the corresponding difference for workers of all ages.

Given their age, it is not surprising that an overwhelming majority of older workers had been with their employer at least a year at the time of their injury or illness. The proportion (nearly three-fifths) with over five years, however, far exceeds the corresponding nationwide figure (one-fourth) for those injured with the lengthiest tenures.

Older workers sustained injuries and illnesses in a wide variety of jobs and job groupings, no one of which made up more than a tenth of the total. (See table 1.) Machine operators, mechanics, and truck drivers together accounted for slightly more than a fourth of the injury total for older workers. Older workers faced a relatively high safety risk working in these jobs, which accounted for about one-eighth of the older work force. Sales occupations, by contrast, were relatively safe for older workers, making up 6 percent of their injury total but 14 percent of their work force total.

Injury and illness characteristics

Survey data reflect four different aspects of each case with days away from work: (1) Physical condition, or nature of injury or illness; (2) part of body affected by the condition; (3) source of injury or illness—the object, substance, environmental exposure, or bodily motion that directly produced or inflicted the condition; and (4) the type of event or exposure associated with the injury or illness—that is, how the condition was inflicted or produced. These features help determine the "what and how" of disabling incidents in the workplace.

Among the categories comprising *nature of injury or illness*, sprains and strains occurred most frequently, accounting for slightly more than one-third of the 168,700 cases reported for workers aged 55 years and over. (See table 1.) Fractures, bruises, and cuts each accounted for about one-tenth of the total. Older workers cited "fractured bone" as the disabling condition about twice as often as did workers under 55 years of age.

The most commonly cited *part of the body affected* was the back and, to a lesser extent, other portions of the trunk (shoulder and chest, for example), accounting for nearly two-fifths of the total for older workers. The upper and the lower extremities each comprised another one-fifth of the total. Cases affecting more than one major body part, such as an arm and a leg, made up another tenth.

"Floor and ground surface" was the leading *source of injury or illness*. This classification, often cited when an injury resulted from a fall, made up nearly a fourth of all cases for older workers. Other common sources mentioned included containers; machines and tools; parts and materials; and the free movement of the body or its parts, with no impact involved. (See table 1.)

The leading *event or exposure* associated with injuries and illnesses to older workers was overexertion, typically in trying to lift heavy or unwieldy objects. This classification was cited in nearly a fourth of the cases. A close second was falls on the same level; its nearly one-fifth share of older worker cases was well above that category's 10-percent share of the national case total. Older workers also were relatively more prone to injuries or illnesses resulting from slipping, tripping, climbing, twisting, and similar incidents of free bodily motion without falling.

Duration of injury or illness

Although older workers are less likely to sustain a serious, nonfatal injury and illness, their cases are more likely to result in relatively lengthy absences from work. The median days away from work was 10 days per case for older workers compared to 6 days per case for all workers.

At least two factors contribute to longer recuperation periods for older workers. First, they take longer to return

Characteristics of Older Workers' Injuries

Older workers face a lower risk of serious, nonfatal injury than do younger workers, but are at higher risk of fatal injury on the job

Martin E. Personick and Janice A. Windau

Until recently, Bureau of Labor Statistics (BLS) researchers lacked reliable national data to analyze the experiences of older workers sustaining serious, nonfatal injuries on the job.[1] They could only speculate how frequently older workers sustained serious injuries and illnesses in the workplace, what the nature of their disabling conditions was, how the injuries occurred, how much work time was lost, and how the safety and health risks of older workers compared with workers of all ages.

The National Academy of Sciences and others pointed out the need to fill information gaps such as these. Specifically, the Academy recommended that the BLS annual survey "be modified to permit collection of detailed data on severe occupational injuries."[2]

In response to such recommendations, BLS asked employers in its 1992 annual survey to describe the circumstances surrounding each reported case that resulted in lost workdays. Case descriptions included selected personal attributes, such as the age, sex, and occupation of the worker. The characteristics of each case were also defined, including the event and source producing the disabling condition. In addition, each case description included a limited measure of case severity, namely, the number of days away from work (not including the day of injury or onset of illness). The result was the first nationwide injury and illness study of its kind that identified both work-related hazards and workers most at risk.

This article uses initial results from the 1992 annual survey to profile the injury and illness experiences of workers, 55 years and older. The analysis shows, for example, that older workers face a somewhat lower risk of sustaining a serious, nonfatal work disability than do younger workers. But older workers disabled on the job lose more worktime per case than their younger counterparts do.

Older workers are also more likely to die of work-related injuries, than their counterparts under age 55, according to the Census of Fatal Occupational Injuries. In addition, the rates of fatal work injury rise with age, peaking at 15 deaths per 100,000 workers aged 65 years and older. In contrast, workers, 25 to 34 years had a fatality rate of 5 per 100,000 in 1993.[3]

Older workers at a glance

The Current Population Survey (CPS), conducted for the Bureau of Labor Statistics by the Bureau of the Census, is the source of employment data shown here for older wage and salary workers in private industry. This subset of CPS data excludes government, the self employed[4], and private household workers, three classes of workers not covered by the nonfatal injury and illness study.

In 1992, about 8.8 million of private industry's 85 million wage and salaried employees were aged 55 years and older, according to CPS data. Nearly 2 million of these older workers were 65 years and older.

Of the 8.8 million older workers, 54 percent were men and 46 percent were women. Coincidentally, these were roughly the same shares of the total private wage and salary work force held by men and women.

The staffing pattern among broad occupational groupings was essentially the same for older workers as it was for those aged 20-54 years. The leading job grouping for both was "technical, sales, and administrative support," accounting for a third of the respective totals. The next largest categories were "managerial and professional specialty" and

[1] The category of "serious, nonfatal injuries" also includes a relatively small percentage of illnesses, such as skin diseases and repetitive motion disorders. It excludes, however, most long-term latent illnesses, such as cancers, which are difficult to relate to the workplace and are believed to be underreported in survey data.

[2] National Research Council, *Counting Injuries and Illnesses in the Workplace: Proposals for a Better System*, 1987, p. 103.

[3] See also Scott Richardson and Andrew Schulman, "Texas Study Finds Older Workers at Relatively High Risk of Fatal Occupational Injury," in *Fatal Workplace Injuries in 1992: A Collection of Data and Analysis*, Bureau of Labor Statistics, Report 870, 1994, pp. 22-29.

[4] The "incorporated self employed," a group included with "other wage and salary workers" in regular CPS tabulations, was excluded, along with the "unincorporated self employed," from the analysis of serious nonfatal injuries. The nonfatal injury and illness data exclude all self employed, regardless of corporate status.

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to work than do younger workers, regardless of disabling condition. And second, they sustain conditions requiring relatively lengthy recuperation, such as broken bones and multiple injuries, more often than do younger workers. Fractures, for example, made up 16 percent of all disabling conditions reported for workers 65 years and over, 10 percent of cases for 55-64 year olds, and 6 percent for workers younger than 55 years. Further research is required to more fully explain why the injuries and illnesses of older workers tend to be so severe.

Profile of fatal injuries

The Bureau's Census of Fatal Occupational Injuries (CFOI) was developed, in part, because of recommendations from the National Academy of Sciences. The fatality census uses multiple data sources (such as death certificates, workers' compensation reports, Occupational Safety and Health Administration fatality reports, and news articles) to compile the most complete count of fatal work injuries available.

Unlike the survey of nonfatal occupational injuries and illnesses, the fatality census includes fatalities to government workers and the self-employed, as well as private sector wage and salary workers. The census also includes workers on farms employing 10 or fewer employees, worksites which are excluded from the survey of nonfatal injuries. Because of the latency period of many occupational illnesses and the resulting difficulty in linking these illnesses to workplace exposures, it is difficult to compile a complete count of all fatal illnesses in a given year. Thus, information on illness-related deaths is excluded from this article. The fatality data provided in this article cover deaths that occurred in 1993.[5]

Table 2 shows selected characteristics of the 1,315 injury fatalities to workers aged 55 and over that occurred in 1993. Workers in this age group accounted for one-fifth of all fatal work injuries that year, but for only one-tenth of the employed population. Overall this group was fatally injured at a rate of 9 per 100,000 workers. The rate rises to 15 per 100,000 for those 65 and older.[6] Men accounted for 94 percent of the fatally injured workers aged 55 and over, similar to their 92 percent share of all worker fatalities.

Older workers who were fatally injured were more likely to be self-employed than younger ones. Forty percent of the older workers who were fatally injured were self-employed[7] compared with 15 percent of workers younger than 55 years.

One-fourth of the fatally injured workers aged 55 or over were working in a farming or related occupation, such as farm operator, manager, worker, or groundskeeper, at the time of the incident. Sales occupations, truckdriving, and executive, administrative, and managerial jobs each accounted for about 10 percent of the fatalities.[8]

The agriculture, forestry, and fishing industries accounted for about one-fourth of the older worker fatalities, but only about one-seventh of all worker fatalities. Five other industry divisions in the private sector each accounted for about one-tenth of the fatality total for older workers: Construction, manufacturing, transportation and public utilities, retail trade, and services. Eight percent of the older workers who were fatally injured were employed by a Federal, State, or local governmental agency.

Highway fatalities topped the list of ways in which both older and younger workers died at work, accounting for about a fifth of each group's total. Although homicides were the second leading cause of death for workers younger than 55, the following events were about equally cited for older workers: Homicides, nonhighway transportation-related incidents, being struck by objects, and falls to lower levels.

Transportation-related incidents that occurred on farms and other nonroadway locations played a larger role in fatalities among older workers than among their younger counterparts. These incidents, such as tractor rollovers and falls from tractors and other nonhighway vehicles, accounted for 12 percent of the fatal injuries to older workers, but for only 5 percent of the fatal injuries to younger workers.

Vehicles were identified as the source of injury in over two-fifths of the fatalities to older workers. Over half of these were highway vehicles; most of the other vehicles were farm tractors. Ammunition is the source for homicides due to shooting, and floor and ground surfaces are typically reported for falls to lower level. Agricultural and construction machinery, parts and materials, and trees were some other noteworthy sources of fatal injury to workers 55 and over.

[5] The nonfatal data in this article cover 1992, because at the time of this report the 1993 case and demographic information was not available. Selected characteristics for nonfatal occupational injuries and illnesses that occurred in 1993 will be released in April 1995.

[6] See Guy Toscano and Janice Windau, "The Changing Character of Fatal Work Injuries," *Monthly Labor Review*, October 1994, pp. 17-28.

[7] The total for self-employed includes paid and unpaid family workers as well as the unincorporated self-employed. It may also include some owners of incorporated businesses and members of partnerships.

[8] While *occupation* provides information on the type of job the worker performed, *industry* provides information on the type of business the employer was engaged in. For example, truck drivers are employed by any number of industries: Trucking and warehousing, construction, retail trade, and manufacturing to name just a few. Thus, the percentages for seemingly similar activities, such as the occupation "truck driver" and the industry "trucking and warehousing," may differ slightly in table 2.

Table 1. Older workers sustaining lost worktime injuries and illnesses, selected characteristics, 1992

Characteristic	Lost work time cases (percent)
Workers 55 years and over:	
Number of cases	168,700
Percent	100
Personal traits	
55 to 64 years	88
65 years and over	12
Men	61
Women	39
Tenure with employer	
Under 3 months of employer service	4
3 to 11 months	7
1 to 5 years	24
Over 5 years	57
Data not reported	9
Occupation	
Sales worker	6
Food preparation, service job	5
Health service job	5
Nursing aide	4
Cleaning, building service job	7
Janitor, cleaner	4
Mechanic, repairer	8
Construction trade	5
Machine operator	11
Truckdriver	8
Freight, stock, and material handler	3
Laborer, nonconstruction	4
Assembler	2
All other jobs	36

Characteristic	Lost work time cases (percent)
Workers 55 years and over:	
Number of cases	168,700
Percent	100
Disabling condition	
Sprain, strain	37
Fracture	11
Bruise, contusion	11
Cut, laceration	8
Multiple injury	5
Hernia	3
All other conditions	25
Disabling event	
Overexertion	23
Fall on same level	18
Struck by object	11
Personal movement, e.g. climbing, tripping	11
Struck against object	7
Fall to lower level	7
Caught in object, equipment.	4
All other events	19
Disabling source	
Floor, ground surface	23
Floor of building	10
Container	13
Box, crate, carton	5
Worker motion or position	13
Part and material	10
Building material	4
Vehicle	7
Highway vehicle	4
Plant or industrial	3
Machinery	7
Tool, instrument, or equipment	5
Furniture, fixture	4
Health care patient	3
All other sources	15

NOTE: Because of rounding and nonclassifiable responses, data may not sum to totals.

SOURCE: Occupational Injury and Illness Survey, U.S. Department of Labor, Bureau of Labor Statistics, 1992.

Table 2. Older workers fatally injured, selected characteristics, 1993

Characteristic	Fatalities (percent)
Workers 55 years and over:	
Number of cases	1,315
Percent	100
Personal traits	
55 to 64 years	61
65 years and over	39
Men	94
Women	6
Class of worker	
Self-employed	40
Wage and salary	60
Occupation	
Farming and related	25
Sales occupation	11
Truck driver	10
Executive, administrative, and managerial	9
Construction trade	8
Other transportation, material moving	6
Laborer (all)	4
Mechanic, repairer	4
Professional specialty	4
Protective service	3
Other service occupation	3
Forestry, logging, fishing, hunting	3
All other jobs	10
Source	
Vehicle	43
Highway	24
Tractor	13
Ammunition	12
Floor, ground surface	11

Characteristic	Fatalities (percent)
Workers 55 years and over:	
Number of cases	1,315
Percent	100
Fatal event	
Highway incident	18
Homicide	13
Nonhighway (farm, industrial premise)	12
Struck by object	10
Fall to lower level	10
Struck by vehicle	6
Caught in object, equipment	6
Other transport	5
Self-inflicted	4
All other events	16
Industry	
Private sector	92
Agriculture, forestry, and fishing	26
Mining	1
Construction	11
Special trades	6
Manufacturing	11
Lumber and wood	3
Transportation, public utilities	11
Trucking, warehousing	7
Wholesale trade	4
Retail trade	12
Food stores	3
Auto dealers, service stations	3
Eating, drinking	3
Finance, insurance, and real estate	3
Services	11
Government	8
Source—Continued	
Machinery	10
Agricultural	4
Construction	4
Part, material	5
Tree	4
All other sources	15

NOTE: Because of rounding and nonclassifiable responses, data may not sum to totals.

SOURCE: Census of Fatal Occupational Injuries, U.S. Department of Labor, Bureau of Labor Statistics, 1993.

Economic Costs of Occupational Injury Fatalities in New Jersey in 1992

Each fatality represents an array of hidden costs, from lost household production to legal and administrative costs

Lisa M. Roche'

Each occupational injury fatality represents a tragedy for the victim, his or her family and co-workers, and society at large. While the suffering of the workers involved can not be quantified, the economic costs can. This article provides estimates of the economic costs of the 114 occupational injury fatalities in New Jersey in 1992, based on the methods of T. R. Miller[1] and T.A. Miller, et al.[2] The estimated costs of occupational injury fatalities can vary depending on assumed values for various unknowns as well as the methods used.

New Jersey's experience

The 114 occupational injury fatalities that occurred in 1992 are estimated to have cost a total of $122,420,908 or $1,073,868 per fatality. Table 1 shows the distribution of the 114 fatalities in New Jersey in 1992 by age, sex, and race. Table 2 contains the estimated total and average costs which are also described below.

Methods. The framework for estimating the costs of occupational injury fatalities was constructed based on the work of T.R. Miller[1] and T.A. Miller, et al.[2] The estimated economic costs were computed on an incidence, rather than prevalence basis; that is, the total present and future costs of the 114 injury fatalities that occurred in 1992 were estimated. All costs are given in 1992 dollars and include lifetime lost wages and benefits, workplace costs, the value of lifetime lost household production, medical services, legal and administrative costs, and property damage resulting from motor vehicle accidents.

Lifetime lost wages. The estimated total lifetime lost wages resulting from the 114 occupational injury fatalities were $63,595,020. With the income cost adjuster for New Jersey of 1.333 the total estimated lifetime lost wages is $84,772,161, or an average of $743,615 per fatality. (The income cost adjuster is the ratio of the per capita income in New Jersey to the per capita income in the U.S. in 1992—$26,457 and $19,841, respectively.)

The lifetime lost wages for each death were estimated using a modification of a formula developed by T.A. Miller, et al.[2] The formula was adjusted to estimate the wage losses due only to occupational injury fatalities, rather than from all injuries:

$$P_{a,s} = \sum_{n=a}^{b} Y_{n,s} \{[(1+X)^{n-a+1/2}]/[(1+D)^{n-a+1}]\} \text{ where}$$

$P_{a,s}$ = present value of future earnings for a person of age a at death and sex s

a = age at death

b = age would have stopped work if had lived, given age a, sex s, race r

$Y_{n,s}$ = average earnings for age n and sex s in 1992

X = annual productivity growth rate

D = annual discount rate

The age at death, race, and sex were obtained from the New Jersey Census of Fatal Occupational Injuries (CFOI) for 1992.[3] The age at which a decedent would have stopped

[1] T.R. Miller, "Costs and Functional Consequences of U.S. Roadway Crashes," *Accident Analysis and Prevention*, 1993; 25:593-607.

[2] T.A. Miller, A.F. Hoskin, D.H. Yalung-Mathews, "A Procedure for Annually Estimating Wage Losses Due to Accidents in the U.S.," *Journal of Safety Research*, 1987; 18:101-119.

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[3] L.M. Roche', *Census of Fatal Occupational Injuries, 1992*, New Jersey Department of Health, Occupational Health Service, February 1994.

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working was calculated by adding the average years of worklife remaining, for those currently active in the labor force[4] to the age at death (assuming no break in employment) and rounded off to the nearest year. The average earnings for year-round, full-time workers by age category and sex in 1992 were obtained from the 1992 Current Population Survey.[5] The average earnings are for 5-year age categories except the youngest age category which is 7 years.

The annual productivity growth rate, 0.014, is the average annual change in business productivity from 1984 to 1993.[6] Because future earnings are generally considered less valuable than current earnings, a discount rate was used to calculate the present value of future earnings. An annual discount rate of 0.04 was used, as in the most recent research.[1,7] The formula was applied to the occupational injury fatality cases to obtain the lifetime lost wages for each. Because national data were used to calculate the lifetime lost wages, the total cost for the fatalities was then multiplied by the income cost adjuster for New Jersey.[8]

Lifetime lost benefits. The estimated lifetime lost benefits were calculated as a percentage of the lifetime lost wages based on total wages and salaries and employer supplements in 1992.[9] Supplements to wages and salaries consist mainly of employer contributions to social insurance (Social Security, unemployment compensation, workers' compensation) and to private pension, health, and welfare funds.

In 1992, wages and salaries in the United States amounted to nearly $3 trillion and supplements to wages and salaries, in the form of benefits, amounted to $629 billion,[9] or 21.3 percent of wages and salaries. When applied to the estimated total lifetime lost wages, this is $18,056,470 or an average of $158,390 per fatality for lifetime lost benefits.

Workplace costs. Workplace costs include hiring and training temporary or permanent replacements for deceased workers and disruption to productivity caused by employee concern.[1] T.R. Miller estimates that severe-to-fatal injuries involve 4 months of lost production. Accordingly, the mean earnings of all persons 15 years and older for 1992[10] prorated to 4 months and the cost of benefits, based on a percentage of the 4-month mean earnings,[9] were added together and multiplied by the number of occupational injury fatalities in New Jersey in 1992. The estimated total for workplace costs was then multiplied by the income cost adjuster.[8]

The mean earnings for all persons 15 years of age and older in 1992 was $22,667;[10] the prorated 4-month mean earnings were $7,556. Average benefits for 4 months were computed as $1,609 (21.3 percent of $7,556) for an average total compensation of $9,165 for 4 months. The estimated total workplace costs were $1,044,810 (114 x $9,165). Multiplied by the New Jersey income cost adjuster, the total estimate is $1,392,732 or $12,217 per fatality.

Lifetime lost household production. Household production includes nonmarket activities in the home. The value of household production is often estimated as anywhere from 29 to 49 percent of the gross national product.[11] Thus, household production is an important factor to include in the costs of occupational injury fatalities. The value of lifetime lost household production for each death was estimated using a modification of the formula for lifetime lost wages:

$$HHP_{a,s} = \sum_{n=a}^{b} HHY_{n,s} \{[(1+X)^{n-a+1/2}]/[(1+D)^{n-a+1}]\} \text{ where}$$

$HHP_{a,s}$ = present value of future household production for a person of age a at death and sex s

a = age at death

b = age expected to live to if had lived, given age a, sex s, and race r

$HHY_{n,s}$ = average monetary value of household production of employed persons for age n and sex s in 1992 dollars

X = annual productivity growth rate

D = annual discount rate

The age at death, race, and sex were obtained from the 1992 New Jersey CFOI.[3] The life expectancy (shown as the number of years of life remaining) at single years of age by race and sex was taken from the National Center for Health Statistics life tables[12] and added to the age at death to obtain the age to which each person would have been expected to live. The mean annual monetary values of household production by age group and sex were used,[11,13] and converted to 1992 dollars using the change in annual average hourly earnings.[14] The annual productivity growth rate in household production was assumed to be 0,[1,15] and the same

[4] *Worklife Estimates: Effects of Race and Education, tables A2 and A5*, Bureau of Labor Statistics, February 1986.

[5] *Money Income of Households, Families, and Persons in the United States, 1992*, Current Population Reports, Series P60-184, Department of Commerce, Bureau of the Census, table 30.

[6] *Productivity and Costs, Fourth Quarter and Annual Averages, 1993*, Bureau of Labor Statistics, USDL 94-64.

[7] *Accident Facts, 1993*, National Safety Council.

[8] *Statistical Abstract of the United States, 1993*, Department of Commerce, Bureau of the Census.

[9] *Economic Report of the President, 1994*.

[10] *Money Income of Households, Families, and Persons in the United States, 1992*, Department of Commerce, Bureau of the Census, table 34.

[11] J.B. Douglass, G.M. Kenney, and T.R. Miller, "Which Estimates of Household Production Are the Best?" *Journal of Forensic Economics*, 1990, 4: 25-45.

[12] *Vital Statistics of the United States, 1989*, Department of Health and Human Services, National Center for Health Statistics, vol. 2, sec. 6, table 6.3.

[13] T.R. Miller, *Household Production of Employed People by Age and Sex in 1991*, National Public Services Research Institute, 1994.

[14] *Monthly Labor Review*, Bureau of Labor Statistics, November 1993, table 14, p. 112.

discount rate used for lifetime lost wages was used, 0.04.[1,7] This formula was applied to each occupational injury fatality case to obtain the estimated value of lifetime lost household production. The estimated total value of lifetime lost household production was then multiplied by the income cost adjuster.[8]

The estimated total value of lifetime lost household production was $9,488,960. Multiplied by the New Jersey income cost adjuster,[8] the total estimated value of lifetime lost household production is $12,648,783, or $110,954 per fatality.

Medical services. Average medical costs per fatality under workers' compensation for New Jersey for the 1987 policy year (N=134) were $10,671,[16] or $15,782 in 1992 dollars.[17] Multiplied by New Jersey's 114 occupational injury fatalities results in total estimated medical costs of $1,799,148.

The average cost per fatality for medical services was obtained from reports by employers covered by private insurance for workers' compensation (that is, not self-insured) submitted to the New Jersey Compensation Rating and Inspection Bureau for 1987 policies (the most recent year with the most valid data).[16] The cost of medical services was converted to 1992 dollars using the Consumer Price Index-All Urban Consumers (CPI-U) for medical care for the Northeast Region (annual average).[17]

Legal and administrative. These costs include incident investigation, record keeping, insurance claims processing, and litigation. Average legal and administrative costs in 1990, as computed by T.R. Miller,[15] were converted to 1992 dollars using the CPI-U[17] and then applied to the fatalities. The estimated total cost was then multiplied by a composite cost adjuster for New Jersey of 1.457.[18] (The composite cost adjuster is used here instead of the income cost adjuster because these costs involve more than income.)

T.R. Miller estimated legal and administrative costs at $18,500 in 1990 dollars per occupational fatality[15] ($19,855 in 1992 dollars).[17] Multiplied by the number of fatalities, this results in total estimated legal and administrative costs of $2,263,470. With the New Jersey composite cost adjuster of 1.457,[18] average costs are $28,929, or $3,297,906 for all the fatalities.

Motor vehicle traffic accidents and property damage. Since a large proportion of the occupational injury fatalities in 1992 involved motor vehicle traffic accidents, property damage costs resulting from them also were calculated. The cost per fatality in 1988 as compiled by T.R. Miller[1] was converted to 1992 dollars using the CPI-U[17] and then applied to the 36 occupational injury fatalities in New Jersey involving motor vehicle traffic accidents (International Classification of Disease, 9th edition, External Injury Codes 810 to 819). The total cost was then multiplied by the composite cost adjuster.[18]

The average property damage cost per person for motor vehicle accidents was $7,294 in 1988 dollars,[1] or $8,650 in 1992 dollars.[17] This amounts to $311,400 for the 36 occupational injury fatalities due to motor vehicle traffic accidents in New Jersey in 1992. Using the New Jersey composite cost adjuster,[18] the estimated cost of property damage per motor vehicle accident is $12,603, or $453,708 for all 36 deaths due to traffic accidents.

Limitations to the data

There are several limitations to the data presented in this article, mostly related to assumptions made due to the lack of information.

Regarding the lifetime lost wages estimates, the remaining years of worklife data are from a 1986 publication (the most recent data available), and do not take into account recent changes in worklife estimates. This probably results in an underestimate of the lifetime lost wages of women, since the trend has been for women to remain in the workforce longer.[4] Also, an assumption was made that employment in the future would be continuous. This is probably correct in most cases, but incorrect in others, which may have resulted in underestimates or overestimates depending on the timing and consequences for earnings of breaks in employment. Average wages in 1992 were given in 5-year age groups, not at single ages. The life expectancy figures used to estimate the value of lifetime lost household production are for 1989, the most recent year with reliable figures by single ages. Unpublished data from the National Center for Health Statistics for 1991 are very similar with differences of 1 year for a few of the single ages. The estimate for workplace costs does not include damage estimates for items such as machinery, equipment, supplies, or physical structures.

The estimated medical costs are based on data from 1987 that do not include all the fatalities in New Jersey (that is, fatalities among employees of self-insured employers, which include most public employers and some large companies, are not included).

The cost estimate for property damage caused by traffic accidents is based on data for all fatal motor vehicle traffic crashes. The costs for work-related fatal crashes may be higher because of the likelihood that expensive vehicles, such as tractor-trailers, trucks, and vans, are involved. Uncertainties in estimates used for other unknowns, such as the discount rate and loss of co-workers' productivity, also affect the cost estimates.

These estimates should not be used for cost-benefit analyses because they are monetary costs only. Elderly, women,

[15] T.R. Miller, *The Costs of Injuries to Employers: A Traffic Safety Compendium, 1993*, Report to the National Highway Traffic Safety Administration.

[16] *Annual Report, 1993*, New Jersey Compensation Rating and Inspection Bureau, 1994.

[17] Annual average data were used from the CPI Detailed Report, Data for January, Bureau of Labor Statistics, 1989-1993.

[18] *ACCRA Cost of Living Index, Fourth Quarter 1993*, American Chamber of Commerce Researchers Association.

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and minority workers are undervalued because their wages are typically lower than those of white males. Another cost component, quality of life, defined as the value placed on avoiding pain, suffering, and lost enjoyment, is needed for any cost-benefit analysis.[1] T.R. Miller estimated a quality of life value for fatalities from a compilation of 47 studies.[19] After adjustments, including corrections for selected systematic biases and reanalyses using uniform values for travel time and the discount rate, the mean and median quality of life value from these studies is $2.2 million in 1988 dollars,[19] or $2.4 million in 1990 dollars[15, 19] per fatality. In 1992 dollars, using the Employment Cost Index,[20] this figure becomes $2.6 million. After subtracting the average lifetime lost wages ($743,615) minus taxes of 15 percent, or $632,073, the average benefits lost ($158,390), and the average value of lost household production ($110,954), the quality of life value is $1,698,583 per fatality. Applying this figure to the 114 occupational injury fatalities in New Jersey in 1992 results in a total quality of life cost of $193,638,460. The economic costs and the quality of life costs together are considered comprehensive costs.[1,7] The estimated comprehensive costs for the 114 occupational fatalities in New Jersey in 1992 were $316,059,368 or an average of $2,772,451 per fatality. It is the comprehensive costs that should be used for cost-benefit analyses.

Other cost estimates. The National Safety Council (NSC) estimates the cost of fatal work accidents in 1992 as $780,000 per fatality.[7] This estimate includes the present value of lost wages, benefits, and household production (using a 4-percent discount rate); medical expenses including ambulance and helicopter transport costs, cost of a funeral, and coroner costs; administrative expenses including insurance, police, and legal costs; travel delay costs and the costs associated with motor vehicle crashes; and employer costs. The estimate does not include lost quality of life. The NSC figure is lower than the estimated average cost of occupational injury fatalities in New Jersey ($1,073,868) largely because of the New Jersey cost adjusters factors. Differences in the age, sex, and race of the occupational fatalities in New Jersey compared with the occupational fatalities nationwide may explain some of the difference in estimated cost per fatality, as may differences in methods of computing the costs.

[19] T.R. Miller, "The Plausible Range for the Value of Life: Red Herrings Among the Mackerel," *Journal of Forensic Economics*, 1990, 3: 17-39.

[20] *Monthly Labor Review*, Bureau of Labor Statistics, November 1993, table 2, p. 104.

Conclusion

As can be seen from table 2, the economic costs of occupational fatalities are enormous. These costs, as well as ethical considerations, can be used to justify the expenditure of time and money on preventing them. The optimal level of expenditures needs to be determined by careful cost-benefit analyses that address nonfatal occupational injuries and illnesses, as well as fatal ones. Further, additional epidemiological information is needed to develop specific policies, programs, and standards to prevent these fatalities.

Acknowledgments

Ted R. Miller of the National Public Services Research Institute is gratefully acknowledged for his assistance in providing information and explaining the methods used to obtain the costs of motor vehicle crashes and occupational injuries. Alan F. Hoskin of the National Safety Council provided invaluable comments on early drafts of the article. Joe Rizzo and Michele Kasick of the Occupational Health Service, New Jersey Department of Health assisted with the lifetime lost wages formula and computation. Rose Marie Martin and Kay Knaublauch of the New Jersey Department of Health also helped obtain needed information. The work of Emily Smith and Noreen Rooks of the New Jersey CFOI Program was also invaluable.

Table 1. Number of occupational injury fatalities in New Jersey by age, race, and sex in 1992

Age	Total	White		Black		Other	
		Male	Female	Male	Female	Male	Female
Total	114	87	5	16	1	5	0
Under 20	1	1	0	0	0	0	0
20-24	13	10	0	3	0	0	0
25-34	24	19	1	3	0	1	0
35-44	27	18	1	5	0	3	0
45-54	27	20	1	4	1	1	0
55-64	13	11	1	1	0	0	0
65 and over	9	8	1	0	0	0	0

Table 2. Costs of New Jersey's occupational injury fatalities by cost category, in 1992 Dollars

Category	Total Cost[1]	Average Cost[1]
Comprehensive costs	$316,059,368	$2,772,451
Quality of life	193,638,460	1,698,583
Total economic costs[2]	122,420,908	1,073,868
Lifetime lost wages	84,772,161	743,615
Lifetime lost benefits	18,056,470	158,390
Workplace costs	1,392,732	12,217
Lifetime lost household production	12,648,783	110,954
Medical services	1,799,148	15,782
Legal and administrative	3,297,906	28,929
Property damage[3]	453,708	12,603

1 These figures apply only to New Jersey's 114 occupational fatalities in 1992.
2 The total economic cost was divided by 114 to obtain the average cost.
3 For the 36 deaths due to motor vehicle traffic accidents.

Fatal Work Injuries in Construction in Texas, 1991-93

Construction laborers have a higher incidence of fatalities than other construction occupations

Scott Richardson and Rene' Reyes

In Texas, construction workers face a higher risk of dying on the job than workers in the State's other industries. Between 1991 and 1993, the construction industry in Texas averaged one fatal work injury every 4 days.[1] Construction fatalities represented 17 percent of all fatal work injuries over the period studied, even though construction workers accounted for only 5 percent of the employed workforce.[2] In fact, there were more fatal work injuries in construction than in any other major industry division in the State over the 3-year period.

Historically, construction fatality rates have been higher in Texas than the Nation as a whole. A National Institute for Occupational Safety and Health (NIOSH) study of fatal occupational injuries that occurred from 1980-89 showed that while nationally construction fatality rates declined during the 1980s, the rates for Texas did not,[3] and even increased during the last 2 years of the decade.[4]

More recent results from the Census of Fatal Occupational Injuries (CFOI) appear to confirm these trends. In 1992, the Bureau of Labor Statistics (BLS) reported that the fatal work injury rate for construction in Texas was 21 fatal work injuries per 100,000 construction workers—a rate 50 percent higher than the national rate.[5] In 1993, Texas' rate dropped to 18 fatal work injuries per 100,000 workers, but still remained well above the national rate of 14 per 100,000.

This article looks at the characteristics of both the incidents and the victims of fatal work injuries in construction in Texas for the years 1991 through 1993.

Profile of selected characteristics

Event or exposure. Event or exposure describes the manner in which the injury was produced or inflicted. (See tables 1 and 2.) Falls were the leading manner of traumatic workplace death in construction over the 3-year period (77 fatalities or 28 percent of the total). Transportation incidents accounted for 65 (24 percent) construction fatalities, including 26 (9 percent) involving highway incidents, and another 26 resulting from workers being struck by vehicles. Electrocutions resulted in 57 fatalities or 21 percent of the fatality total. Another 22 workers (8 percent) died as the result of being struck by an object; 19 of the 22 involved workers struck by falling objects. Eleven workers were caught in or crushed by collapsing materials (primarily collapsing structures).

While 26 of the 65 fatal work injuries involving transportation incidents occurred on the highway, the remainder involved nonhighway and pedestrian events. Seven of the 10 workers involved in nonhighway accidents fell from and were struck by a vehicle. Of the 26 workers struck by vehicles, 8 were pedestrians in the roadway.

Of the 57 electrocutions recorded over this period, 10 involved overhead power lines, 7 resulted from contact with the electric current of a machine, tool, appliance or light fixture, and 6 occurred after contact with wiring, transformers, or other components.

Source of injury. The source of injury identifies the object, substance, bodily motion, or exposure which directly produced or inflicted the injury. Surfaces (floors, walkways,

[1] The data presented in this study were gathered through the Census of Fatal Occupational Injuries (CFOI) program, a cooperative program sponsored by the U.S. Department of Labor, Bureau of Labor Statistics and participating State agencies. The CFOI collects data on all fatal occupational injuries, including those involving private wage and salary workers, the self-employed, and government employees. Fatal workplace injuries are substantiated by two independent sources before being included in the CFOI total. See Guy Toscano and Janice Windau, "Further Testing of a Census Approach to Compiling Data on Fatal Work Injuries," *Monthly Labor Review*, October 1991, pp. 33-36. All fatal workplace injuries in construction that occurred in Texas in 1991, 1992, and 1993 are included in the data presented here with the exception of five fatalities that were excluded because the injury occurred before 1991 or because bodily conditions unrelated to the injury may have been a factor.

[2] Bureau of Labor Statistics, U.S. Department of Labor, *Geographic Profile of Employment and Unemployment, 1991*, (Bulletin 2410), 1992 (Bulletin 2428), and 1993 (Bulletin 2446).

[3] NIOSH, National Traumatic Occupational Fatality Surveillance System.

[4] University of Houston, Health Law and Policy Institute, *Occupational Injury and Illness in Texas*, Report to the Texas Legislature, March 1993, p. 72.

[5] The fatality rates represent the number of fatal work injuries per 100,000 employed and were calculated as: (N/W) X 100,000 where N = the total number of fatal work injuries, and W = total employment, based on the Bureau of Labor Statistics, Current Population Survey. "N" was adjusted to maintain consistency with employment coverage (W) in the rate calculations.

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ground) were the source of injury in the highest number of fatalities (66 or 24 percent) due to the high number of falls. Highway vehicles were the source of injury in 49 fatalities (18 percent); machine, tool, and electric parts accounted for another 35 fatalities (13 percent). Most of the fatal work injuries associated with machine, tool, and electric parts involved power lines, transformers, and converters (20 of the 35 fatal work injuries in that category). The two main sources of injury under "machinery" were road grading and surfacing machinery and cranes, each accounting for seven fatal work injuries. (See table 3.)

Industry. Under the Standard Industrial Classification (SIC) system,[6] there are three major groups within the construction industry: Building construction (SIC 15), heavy construction other than building construction (SIC 16), and special trade contractors (SIC 17). Of these groups, special trade contractors had the largest number of fatal work injuries (152 or 55 percent of the total). Heavy construction had 92 fatalities, or 33 percent; building construction recorded 32 fatal work injuries, or 12 percent of the total. Falls comprised the highest percentage of fatal events among both special trade contractors (36 percent) and building construction industries (44 percent). In heavy construction, which includes highway and street construction, transportation incidents accounted for the highest percentage of fatal work injuries (38 percent). The specific industries with the highest number of fatal occupational injuries are presented in table 4.

Occupation and employee status. The combined total for two occupational divisions—the precision production, craft, and repair division (which includes construction trades) and the operators, fabricators, and laborers division—accounted for more than 9 out of 10 fatal work injuries in construction over the 3-year period. The highest number of fatalities in construction were recorded by the following occupational groups: Construction trades (111 fatalities); handlers, equipment cleaners, helpers, and laborers (83 fatalities); and transportation and material moving occupations (29 fatalities). Ten percent of the fatally injured workers were self-employed. (See table 5.)

Falls accounted for 41 percent of the fatal work injuries in the construction trade occupations. Most of the fatal injury events involving handlers, equipment cleaners, helpers, and laborers were divided nearly evenly between exposure to harmful substances or environments (28 percent), transportation incidents (27 percent), and falls (25 percent). Transportation incidents accounted for 3 out of 5 fatal work injuries among transportation and material movers.

Falls were the leading manner of fatal work injury for construction laborers (20 fatalities), roofers (13), supervisors (7), carpenters (6), structural metal workers (5), and welders and cutters (3). Electrocution was the leading manner of fatal injury for electricians (10 fatalities). Fatal work injuries among painters in construction were divided between electrocutions and falls; each of which accounted for 3 fatalities. The most frequent fatal injury events for truck drivers were highway incidents at 4. For grader, dozer and scraper operators, it was falling from and being struck by vehicles (2).

Construction laborers (in the operators, fabricators, and laborers occupational division) were involved in 1 of every 4 fatal work injuries over the 3-year period—more than four times the number for the occupation with the next highest total. Some differences were observed when the percent distribution of fatal events for laborers was compared to the distribution for all other construction occupations. Laborers had a higher percentage of fatalities from:

- Being struck by falling objects (13 percent versus 6 percent for all other construction occupations);
- Being struck by vehicles (15 percent versus 7 percent);
- Exposure to temperature extremes (7 percent versus 1 percent);
- Exposure to oxygen deficient environments (4 percent versus 1 percent).

Time of day and day of week. The time of injury is known in 231 of the 276 cases. Of those, more than 1 in 4 (62 of the 231 cases) occurred toward the end of the construction worker's day between 1:00 p.m. and 2:59 p.m. The 2-hour period between 10:00 a.m. and 11:59 a.m. experienced the second highest total (53 fatal work injuries). Mondays, Tuesdays, and Thursdays recorded the most fatal work injuries with about 50 each.

Demographic profile. Of the 276 construction workers who died on the job between 1991 and 1993, all but 2 were male. (See table 6.) White workers accounted for 93 percent of the fatalities. Hispanic workers accounted for over 40 percent of the fatalities in construction, somewhat above their one-third share of all construction workers.[7]

Over 70 percent of the fatalities involved workers between 25 and 54 years of age; another 18 percent of the workers were under 25 years of age. Some differences between the types of events suffered by younger and older workers were observed. For example, younger workers (16 to 44 years of age) had a higher percentage of fatalities resulting from exposure to harmful substances or environments (e.g., electrocutions) than workers 45 years of age and over (32 percent versus 12 percent, respectively). But, older workers had a higher percentage of fatal falls than younger workers (38 percent versus 25 percent, respectively).

[6] Industries in this article are defined according to the *Standard Industrial Classification Manual*, 1987 edition, issued by the U.S. Office of Management and Budget.

[7] Hispanic workers can be of any race and are counted separately in the totals for race.

Hispanic workers in construction. Nearly 7 out of 10 of the 75 construction laborers who died on the job during the 3-year period were Hispanic. Hispanic workers also suffered 37 percent of the fatal injuries in the construction trade occupations and 31 percent of the fatal injuries in the transportation and material moving occupations.

Available employment data indicate that the percentage of fatalities involving Hispanic construction workers is higher than their share of employment.[8] In 1991, for example, Hispanic workers comprised about 40 percent of the employed workforce in the handlers, equipment cleaners, and laborers occupational group, but were involved in over 60 percent of the fatalities reported for that group. (Construction fatalities accounted for over 50 percent of the fatalities recorded for that occupational group in 1991.) Overall, Hispanic workers accounted for about 34 percent of the employed workforce in construction in 1991 but were involved in 41 percent of the fatal work injuries.

It is clear that at least some of the fatal work injuries involve undocumented workers or those with false documentation. The exact number of such situations is unknown. However, a study of fatal work injuries involving excavation cave-ins from 1976-1985 found that 32 of the 93 fatalities (or 34 percent) involved workers who were not U.S. citizens.[9]

Table 7 lists the construction occupations and industries recording the most fatal work injuries from 1991 through 1993 by number and percentage of Hispanic workers.

[8] Employment data for most of the specific populations and time periods explored in this study were not available. The employment data cited in this section are unpublished data from the 1991 Current Population Survey conducted by the Bureau of Labor Statistics.

Conclusion

While recent efforts by the Occupational Safety and Health Administration (OSHA) to strengthen safety standards in construction should improve safety in some areas (fall protection and scaffolding standards are two that were recently revised), other preventable accidents also deserve the attention of safety professionals. For example, workers who were struck by vehicles (as pedestrians) ranked behind only falls to lower levels and electrocutions as the leading manner of traumatic workplace death on the State's construction sites. In addition, due to the large number of Hispanics working in construction in Texas, safety professionals and employers should provide training, instructions, and written materials in Spanish as needed.

In response to these and other data, the Texas Workers' Compensation Commission has developed several publications and training programs for employers and employees in Texas, including an accident prevention plan and safety inspection checklist for construction; training programs and publications on fall protection, scaffolding safety, hand and power tool safety, personal protective equipment, and control of hazardous energy in addition to the 10-and 30-hour construction standards courses. Most programs are free or involve only nominal charges. All of them will be available in Spanish in the near future.

[9] See P. Honchar and L. Suarez, "Excavation Cave-In Fatalities—Texas, 1976-1985," *Morbidity and Mortality Weekly Report*, 1986; vol. 35, pp. 313-14. Further study of undocumented workers and workers who live out of State could explain, in part, the relatively high fatality rates in Texas. The employment figures used in the denominator to calculate rates are based on the State where the worker resides. The fatality figures are based on the State where the incident occurred. The rate calculation would, therefore, be affected if a State had a large number of workers who resided in another State or country or who were missed in employment counts because of their legal status.

Table 1. Fatal occupational injuries in construction by event, Texas, 1991-93

Event or exposure	Number	Percent
Total fatalities	276	100
Falls	77	28
To lower level	74	27
From roof	27	10
From scaffolding	15	5
Exposure to harmful substances or environments	74	27
Contact with electric current	57	21
With overhead power lines	10	4
With machine, tool, appliance, or light fixture	7	3
With wiring, transformers, other components	6	2
Contact with temperature extremes	7	3
Exposure to environmental heat	5	2
Caustic, noxious, or allergenic substances	6	2
Oxygen deficiency, n.e.c.	4	1
Transportation incidents	65	24
Pedestrian, nonpassenger struck by vehicle	26	9
Struck by vehicle, mobile equipment in roadway	8	3
Highway incident	26	9
Collision between vehicles, mobile equipment	12	4
Nonhighway accident, except rail, air, water	10	4
Fell from, struck by vehicle, mobile equipment	7	3
Contact with objects and equipment	41	15
Struck by object	22	8
Struck by falling object	18	7
Caught in or crushed in collapsing materials	11	4
Caught in or crushed in collapsing structure	6	2
Caught in or compressed by equipment or objects	8	3
Fires and explosions	10	4
Explosion	5	2
Fire—unintended or uncontrolled	5	2
Assaults and violent acts	8	3
Assaults and violent acts by persons	6	2
Other or nonclassifiable	1	([1])

[1] Less than 0.5 percent.

n.e.c. = not elsewhere classified

NOTE: Events are coded according to the 1992 BLS Occupational Injury and Illness Classification Structures. Division totals may include data for specific event categories not shown separately. Percentages may not add to total due to rounding.

SOURCE: Texas Workers' Compensation Commission, Census of Fatal Occupational Injuries, 1991-93.

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Table 2. Fatal occupational injuries in construction involving falls, Texas, 1991-93

Type of fall	Number	Percent
Total falls	77	100
Fall from roof	27	35
Fall from roof, unspecified	13	17
Fall through roof surface	5	6
Fall from roof edge	5	6
Fall through skylight	3	4
Fall from scaffold	15	19
Fall from building girders or other structural steel	8	10
Fall from ladder	6	8
Fall from floor, dock, or ground level	5	6
Fall from nonmoving vehicle	4	5
Other or nonclassifiable	12	16

n.e.c. = not elsewhere classified

NOTE: Events are coded according to the 1992 BLS Occupational Injury and Illness Classification Structures. Totals may include data for specific event categories not shown separately. Percentages may not add to total due to rounding.

SOURCE: Texas Workers' Compensation Commission, Census of Fatal Occupational Injuries, 1991-93.

Table 3. Fatal occupational injuries in construction by source of injury, Texas, 1991-93

Source of injury	Number	Percent
Total fatalities	276	100
Structures and surfaces	82	30
Floors, walkways, ground	66	24
Other structural elements	7	3
Structures	5	2
Vehicles	57	21
Highway vehicle, motorized	49	18
Truck	30	11
Pickup truck	8	3
Semitrailer, tractor trailer, trailer truck	6	2
Plant and industrial vehicles, tractors	4	1
Parts and materials	55	20
Machine, tool, and electric parts	35	13
Power lines, transformers, converters	20	7
Building materials—solid elements	15	5
Structural stones or slabs, n.e.c.	6	2
Concrete blocks, cinder blocks	5	2
Fasteners, connectors, ropes, ties	3	1
Machinery	33	12
Construction, logging, and mining	15	5
Road grading and surfacing	7	3
Material handling	10	4
Cranes	7	3
Heating, cooling, and cleaning	3	1
Persons, plants, animals and minerals	8	3
Nonmetallic minerals, except fuel	5	2
Chemicals and chemical products	6	2
Containers	5	2
Tools, instruments, and equipment	5	2
Hand tools—powered	3	1
Other sources	23	8
Atmospheric and environmental conditions	14	5
Fire, flame, smoke	6	2
Ammunition	5	2
Steam, vapors, liquids, n.e.c.	3	1
Nonclassifiable or unknown	2	1

n.e.c. = not elsewhere classified

NOTE: Sources of injury are coded according to the 1992 BLS Occupational Injury and Illness Classification Structures. Division totals may include data for specific source categories not shown separately. Percentages may not add to total due to rounding.

SOURCE: Texas Workers' Compensation Commission, Census of Fatal Occupational Injuries, 1991-93.

Table 4. Construction industries with 10 or more fatal work injuries, Texas, 1991-93

Industry	Total fatalities	Most frequent fatal events	Number
		Type	
Highway and street construction (SIC 1611)	35	Pedestrian struck by vehicle	13
Roofing, siding, and sheet metal work (SIC 1761)	30	Fall to lower level	22
Electrical work (SIC 1731)	26	Contact with electric current	15
Water, sewer, and utility line construction (SIC 1623)	23	Fall to lower level; contact with electric current	5 5
Special trade contractors, n.e.c. (SIC 1799)	20	Contact with electric current	7
Heavy construction, n.e.c. (SIC 1629)	19	Struck by object; fall to lower level	3 3
Bridge, tunnel, and elevated highway construction (SIC 1622)	13	Contact with electric current	4
Carpentry work (SIC 1751)	11	Fall to lower level	5
Plumbing, heating, air conditioning (SIC 1711)	11	Contact with electric current	6
General contractors—single family houses (SIC 1521)	10	Fall to lower level	4

n.e.c. = not elsewhere classified

NOTE: Industries are coded according to the *Standard Industrial Classification Manual*, 1987 edition.

SOURCE: Texas Workers' Compensation Commission, Census of Fatal Occupational Injuries, 1991-93.

Table 5. Fatal occupational injuries in construction by occupation and employee status, Texas, 1991-93

Worker characteristic	Number	Percent
Total fatalities	276	100
Occupation		
Precision production, craft. and repair	129	47
Construction trades	111	40
Electricians	18	7
Roofers	18	7
Supervisors, n.e.c	17	6
Carpenters	16	6
Plumbers, pipefitters, steamfitters	9	3
Painters	6	2
Structural metal workers	6	2
Mechanics and repairers	12	4
Precision production	4	1
Operators, fabricators, and laborers	125	45
Handlers, equipment cleaners, helpers, and laborers	83	30
Construction laborers	75	27
Helpers, construction trades	4	1
Transportation and material moving	29	11
Truck drivers	10	4
Operating engineers	8	3
Grading, dozer, scraper operators	5	2
Fabricators, assemblers, and handworkers	11	4
Welders and cutters	11	4
Managerial and professional specialty occupations	9	3
Technical, sales, and administrative support	8	3
Other or not reported	5	2
Employee status		
Wage and salary	245	89
Self-employed	28	10
Other or unknown	3	1

n.e.c. = not elsewhere classified

NOTE: Occupations are coded according to the 1990 Census Occupational Classification System, developed by the Bureau of the Census. Division totals may include data for specific occupational categories not shown separately. Percentages may not add to total due to rounding.

SOURCE: Texas Workers' Compensation Commission, Census of Fatal Occupational Injuries, 1991-93.

Table 6. Fatal occupational injuries in construction by demographic profile, Texas, 1991-93

Worker characteristic	Number	Percent
Total fatalities	276	100
Sex		
Male	274	99
Female	2	1
Race		
White	256	93
Black	15	5
Other	2	1
Not reported	3	1
Hispanic origin		
Hispanic	113	41
Age		
16-19	10	4
20-24	38	14
25-34	84	30
35-44	75	27
45-54	36	13
55-64	29	11
65 and older	4	1

NOTE: Percentages may not add to total due to rounding.

SOURCE: Texas Workers' Compensation Commission, Census of Fatal Occupational Injuries, 1991-93.

Table 7. Occupations and industries in construction with more than 15 fatal work injuries by Hispanic origin, 1991-93

Worker characteristic	Total fatalities	Hispanic workers	
		Number	Percent of total fatalities
Occupation			
Construction laborers	75	51	68
Roofers	18	11	61
Electricians	18	1	6
Supervisors, n.e.c.	17	4	24
Carpenters	16	8	50
Industry			
Highway and street construction (SIC 1611)	35	15	43
Roofing, siding, and sheet metal work (SIC 1761)	30	21	70
Electrical work (SIC 1731)	26	3	12
Water, sewer, and utility lines (SIC 1623)	23	7	30
Special trade contractors, n.e.c (SIC 1799)	20	7	35
Heavy construction, n.e.c (SIC 1629)	19	10	53

n.e.c. = not elsewhere classified

NOTE: Occupations are coded according to the 1990 Census Occupational Classification System, developed by the Bureau of the Census. Division totals may include data for specific occupational categories not shown separately. Percentages may not add to total due to rounding. Industries are coded according to the *Standard Industrial Classification Manual*, 1987 edition.

SOURCE: Texas Workers' Compensation Commission, Census of Fatal Occupational Injuries, 1991-93.

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Violence in the Workplace

Patterns of fatal workplace assaults differ from those of nonfatal ones.

Guy Toscano and William Weber

Violence has emerged as an important safety issue in today's workplace. Its most extreme form, homicide, is the second leading cause of death resulting from job-related injuries, accounting for 1,063 of the 6,271 fatal injuries at work in 1993.[1] On average, three workers died each day under violent circumstances, among them taxicab drivers and fast food workers who were victims of robbery attempts. In addition to work-related homicides, more than 22,000 workers who were assaulted by persons at work in 1992 received injuries serious enough to require a day or more away from work.

This article summarizes information on injuries resulting from workplace violence available from the Bureau of Labor Statistics' (BLS) Census of Fatal Occupational Injuries and its Survey of Occupational Injuries and Illnesses programs, conducted in cooperation with State agencies. Data from these two programs tell which workers commonly sustain injuries due to violent acts, where this violence occurs, and how it happens. Interestingly, these circumstances differ markedly between homicides and nonfatal assaults at work.

Fatal and nonfatal assaults

Homicides make up a larger share of all fatal injuries than the share of serious, nonfatal injuries and illnesses resulting from nonfatal assaults. Of the 6,271 job-related fatal injuries, 17 percent were homicides. In contrast, 1 percent of the 2.3 million cases resulting in workdays lost resulted from assaults and violent acts in the workplace. Some safety and health experts contend that this difference might reflect, in part, less recognition and reporting of nonfatal violence in the workplace than actually takes place.

Table 1 summarizes some of the major differences in the characteristics of homicides and nonfatal assaults. For example, most homicide victims were men shot during a robbery, while women were most often the victims of nonfatal violence, commonly nursing staff hit or kicked by their patients.

[1] Homicide is generally defined here as intentionally taking another's life or killing another while committing a crime. Highway motor vehicle fatalities was the leading cause of workplace fatalities, accounting for 20 percent of the work injury fatality total. See Guy Toscano and Janice Windau, "The Changing Character of Fatal Work Injuries," *Monthly Labor Review*, October 1994, pp. 17-28.

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Table 1. Fatal and nonfatal assaults at work by selected characteristics[1]

Characteristic	Fatal		Nonfatal	
Number of workers injured		1,063		22,396
Percent		100		100
Sex injured more frequently	Men	82	Women	56
Most frequent violent act	Shooting	82	Hitting, kicking, beating	47
Primary perpetrator	Robber	75	Health care patient	45
Occupations with largest share	Taxi driver Cashier	9 9	Nurse's aides	30
Industries with largest share	Grocery stores Restaurants	17 14	Nursing homes	27

[1]Data on fatalities is for 1993: data on nonfatal assaults is for 1992.

Homicides at work

Although work-related homicides are newsworthy items, the motives behind these crimes still are largely misunderstood. While conventional wisdom believes them to be primarily crimes of anger and passion, BLS statistics point to robbery as the primary motive. Table 2 shows that robberies and related crimes, usually committed by persons unknown to the victims, accounted for three-fourths of the 1,063 homicides at work in 1993 compared to one-seventh committed by disgruntled co-workers, clients, or personal acquaintances.

Table 2. Circumstances of job-related homicides, 1993

Circumstance	Number	Percent
Total	1,063	100
Robberies and other crimes	793	75
Work associates as perpetrator	106	10
Co-worker, former co-worker	59	6
Customer, client	43	4
Police killed in the line of duty	67	6
Security guard killed in the line of duty	52	5
Personal acquaintances as perpetrator	45	4
Victim's husband, ex-husband	15	1
Boyfriend, ex-boyfriend	11	1
Other relative	6	1
Other friends and acquaintances	11	1

Although no one is immune from becoming the victim of a workplace homicide, the risk varies greatly among jobs. Victims worked in such diverse occupations as cooks, food servers, auto mechanics, truck drivers, secretaries, janitors, and stock handlers and baggers. (See table 8.) Those at greatest risk generally work alone, late at night, and are known to handle cash. Ironically, however, the cash stolen is often a nominal amount.

Occupations carrying the highest risk of homicide are shown in table 3. This list is limited to occupations having 20 or more homicides and employment of at least 100,000 in 1993. Overall, one homicide occurs for every 100,000 workers. (These rates are experimental, using annual averages of employment from the Current Population Survey.)[2]

Table 3. Occupations with the highest risks of work-related homicides, 1993

Occupation	All fatalities	Number of homicides	Homicides per 100,000 employed	
			Rate[1]	Relative standard error (percent)[2]
Total	6,271	1,063	.9	0.15
Taxi drivers and chauffeurs	113	97	43.1	6.83
Gas station attendant	34	22	11.1	7.28
Sales counter clerk	24	22	11.3	7.34
Police and detectives (public service)	101	57	11.2	4.53
Guards (excluding public service)	100	54	6.5	3.54
Managers, food and lodging	84	59	4.9	2.95
Sales, supervisors and proprietors	247	178	4.4	1.60
Cashiers	101	94	3.6	2.00

[1] Experimental measure using Current Population Survey (CPS) employment data. This rate represents the number of fatal occupational injuries per 100,000 employed and was calculated as follows:

N/W x 100,000, where N = number of fatal work injuries and W = employment based on the 1993 CPS.

[2] The CPS employment data used to calculate rates are estimates that are based upon a sample of persons employed rather than a complete count. Therefore, the employment estimates and the fatality rates have sampling errors; that is, they may differ from figures that would have been obtained if it had been possible to take a complete census of employed persons. See Explanatory Notes on Household Data in the January 1994 issue of the BLS publication, *Employment and Earnings*, for an explanation of CPS sampling and estimation procedures and standard error tables. The relative standard error can be used to calculate a "confidence interval" around the estimated rate. For example, to calculate a confidence interval of 90 percent: rate +/- (rate * 1.64 * relative standard error). Thus, the confidence interval for taxi drivers at a 90 percent level = 43.1 +/- (43.1 • 1.64 • 6.83%) = 43.1 +/- 4.2. Hence, we are 90 percent confident that the interval between 38.9 and 47.3 includes the true rate for taxi cab drivers.

Taxicab drivers and chauffeurs face unusually high risks of becoming homicide victims, with a rate of 43 homicides per 100,000 workers. This occupation accounted for almost a tenth of all victims of job-related homicide, but less than one-half of 1 percent of the Nation's work force. Nocturnal trips, especially those to secluded areas, make these drivers particularly vulnerable. Almost half the cab drivers died from 9 PM to 3 AM. The New York City metropolitan area accounted for almost half of all homicides involving taxicab drivers and chauffeurs; whereas, the employment of these workers in this area is about 20 percent of the national employment for this occupation.[3]

Law enforcement and retail sales were other activities where the risks of homicide are especially high. The rate of work-related homicides exceeded 10 times the national average for gas station attendants, sales counter clerks, and police and detectives in the public sector and 3.5 to 6.5 times the national average for private guards, managers of food serving and lodging businesses, and sales cashiers and proprietors. Robbery and homicide at work are closely linked. That linkage extends to the risky jobs mentioned above as well as several others, including bartenders and other restaurant staff, stock handlers in retail stores, and even cleaning staff working at the time of the robbery. However, homicide risks can vary within an occupation. Cashiers in retail stores face a higher risk of homicide than do bank cashiers, for example.

Workers in retail establishments, such as convenience stores, retail groceries, and restaurants, face an above-average risk. They account for about half of all homicides, but make up only a sixth of the Nation's work force. Outside of retail trade, individual industries in which at least 10 homicides occurred in 1993 included detective and armored car service, real estate, health services, automobile repair shops, police protection, and video tape rental. (See Table 9.) Table 4 shows a few industries that have particularly high risks of homicide.

Table 4. Industries with high risks of work-related homicides, 1993

Industry[1]	Number of homicides	Rate[2]
Taxicab operation (SIC 4121)	96	79
Gasoline service stations (SIC 5541)	53	13
Grocery stores (SIC 5411)	175	6
Detective & armored car services (SIC 7381)	26	5
Eating and drinking places (SIC 581)	144	2

[1] Based on the *Standard Industrial Classification Manual*, 1987 edition.

[2] Experimental measure using CPS employment data. This rate represents the number of fatal occupational injuries per 100,000 employed and was calculated as follows: N/W x 100,000, where N = number of fatalities and W = employment based on the 1993 CPS.

Table 4 also illustrates the importance of looking at dangerous activities from the perspective of both occupation and industry. For example, the risk of homicide for taxicab drivers and chauffeurs, although unusually high, still substantially understates the homicide risk for cab drivers by

[2] Unless indicated otherwise, employment data from the 1993 Current Population Survey (CPS) were used to calculate fatality rates and employment shares for demographic and industry groups.

[3] The 1990 Decennial Census, the latest data available on specific occupations by metropolitan area.

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themselves. The "taxicab operation" industry estimates that risk at 79 per 100,000 workers, compared with 43 per 100,000 for taxicab drivers and chauffeurs. Unlike the taxicab industry, the latter occupation includes a substantial number of drivers on regular routes, such as airport-to-airport transfers, activities for which the homicide risk is relatively low. Similarly, the homicide rate for gas station attendants somewhat understates the homicide risks of working in gas stations, which employ cashiers, mechanics, and workers in other occupational categories besides station attendant.

The majority of homicides occur in public business establishments such as grocery stores, restaurants and cafes, and office buildings. Other locations that are commonly the site of homicides include parking lots and garages, and streets. Private residences, residential institutions (such as prisons), and schools are also sites of homicides. Homicides occurring at private residences primarily involve maintenance workers or police while in the line of duty. (See table 5.)

Table 5. Work-related homicides by location, 1993

Location	All fatalities		Homicides	
	Number	Percent	Number	Percent
Total	6,271	100.0	1,063	100.0
Public building[1]	964	15.4	624	58.7
Market or grocery store	244	3.9	219	20.6
Shop, commercial, store (except grocery)	225	3.6	144	13.5
Restaurant, cafe	127	2.0	102	9.6
Office building	125	2.0	49	4.6
Street or highway	1,740	27.7	144	13.5
Parking lot, garage	211	3.4	82	7.8
Industrial place or premise	1,373	21.9	69	6.5
Private residence[2]	231	3.7	53	5.0

[1] Buildings and adjacent grounds used by the general public or a particular group, such as hotels, restaurants, stores, office buildings, and schools.
[2] These fatalities primarily occurred to repair or maintenance workers or to police while in the line of duty.

Work-related homicides are primarily an urban problem. Eight of the largest metropolitan areas accounted for almost half the job-related homicide victims. (See table 6.) Homicide was the leading cause of fatal work injuries in about one-third of the States.[4]

Men account for the majority (82 percent) of all homicide victims, far exceeding their 55-percent share of the work force. Women's share of all homicides is also noteworthy, however, in that homicide was, by far, the leading way in which they were fatally injured. (Men more often were victims of highway fatality or contact with deadly objects.) Women, in fact, had a larger share of all homicides

Table 6. Total fatal work injuries and homicides in some of the largest metropolitan areas, 1993.

Metropolitan area[1]	Number of work injuries	Number of homicides	Homicides as a percent of total fatalities in that area
Total U.S.	6,271	1,063	17
NY-Northern NJ-Long Island	364	166	46
Los Angeles-Riverside-Orange County	279	117	42
Chicago-Gary- Lake County	153	33	22
Philadelphia-Wilmington-Atlantic City	127	42	33
Houston-Galveston-Brazoria	124	43	35
Washington-Baltimore	122	35	29
San Francisco-Oakland-San Jose	107	34	32
Dallas-Fort Worth	103	32	31

[1] Areas are defined according to the U.S. Office of Management and Budget metropolitan statistical areas (MSAs), Bulletin 93-17, June 30, 1993.

(18 percent) than their share (8 percent) of all fatal work injuries reported in the 1993 BLS fatality census. (See table 10.)

Blacks, Asian Americans, and other minority races face a higher risk of homicide than their proportion of the work force would suggest. They comprise more than a fourth of all homicide victims compared with an eighth of the work force. The higher homicide risk for such minorities is explained in part by their disproportionate share of the work force in occupations where the homicide rate is high, such as taxicab drivers and managers and proprietors of small business establishments. Blacks, for example, represent 10 percent of the total labor force but account for 24 percent of taxi drivers.[5] Hispanics (who may be of any race) also have higher risks of homicide at work; they accounted for a sixth of all such homicides, double their share of the total work force. Immigrants to the United States also had a high risk of job-related homicide, accounting for 22 percent of the homicides victims, whereas, they represent about 9 percent of the employed.[6]

Nonfatal assaults by persons

In 1992, about 22,400 workers were injured seriously enough in nonfatal assaults in the workplace to require days away from work to recuperate. These assaults by persons other than the injured account for about 1 percent of the 2.3 million cases that were reported in 1992 by employers participating in the BLS Survey of Occupational Injuries and Illnesses. Women were the victims in 56 percent of these assaults.

Nonfatal violent acts usually took the form of "hitting and kicking," resulting in an average of 5 days away from work. This form of violence accounted for almost half the nonfatal assaults. Shootings, which accounted for 82 per-

[4] See Tracy Jack and Mark Zak, "Results from the Census of Fatal Occupational Injuries, National and State Data, 1993," *Compensation and Working Conditions*, February 1995.

[5] See annual average employment from the 1993 Current Population Survey.

[6] Current Population Survey, 1991. This is the latest available data on immigrants in the U.S. labor force.

cent of fatal workplace assaults, accounted for about 3 percent of the nonfatal assaults. Half of the workers receiving nonfatal gunshot wounds, almost all men, commonly required over 30 days to recuperate. (See table 7.)

Table 7. Nonfatal assaults by persons resulting in days away from work, private industry, 1992

Violent act	Total cases	Women as a percent of total	Median days away from work
Total, violent acts by persons	22,396	56	5
Hitting, kicking, beating	10,425	55	5
Squeezing, pinching, scratching, twisting	2,457	84	4
Biting	901	53	3
Stabbing	598	7	28
Shooting	560	3	30
All other specified acts (e.g., rape, threats)	5,157	60	5
Unspecified acts	2,301	46	6

SOURCE: BLS Survey of Occupational Injuries and Illnesses, 1992.

Nonfatal assaults were primarily encounters between patients and nursing staff in health care institutions. Other occupations where violence at work produced lost work time included private security guards, truck drivers, and sales workers. (See table 11.)

Almost two-thirds of nonfatal assaults occurred in service industries, such as nursing homes, hospitals, and establishments providing residential care and other social services (halfway homes, for example). Retail trade industries such as grocery stores and eating and drinking places accounted for about one-fifth of these assaults.

About half the nonfatal injuries were sprains, strains, and bruises. The part of the body most affected was the trunk—particularly the back and shoulder areas. Also of note were relatively large numbers of head injuries and serious injuries affecting several parts of the body.

Methods and limitations

Collecting detailed information for workers seriously injured on the job was recommended a National Academy of Sciences report as an important step in identifying and eradicating the sources of serious injuries in the workplace.[7] The fatality census uses multiple data sources such as death certificates, workers' compensation reports and claims, Occupational Safety and Health Administration files, and news articles to compile the most complete count of fatal work injuries that is possible. The scope of the program is to collect information on all work-related fatalities including those to private wage and salary workers, government employees, and the self-employed.

The Survey of Occupational Injuries and Illnesses is based on a scientifically selected sample of business establishments in the private sector. Unlike the fatality census, the self-employed and government workers are excluded from the scope of the survey of nonfatal injuries. These differences may affect comparisons of data for fatal and nonfatal workplace assaults. The self-employed accounted for about one-fourth of the victims of workplace homicide, primarily in retail trade. Police and other law enforcement officers in the public sector, another group not covered in the survey of nonfatal injuries and illnesses, accounted for 6 percent of the homicides occurring at work.

The data on workplace homicides were compiled in the 1993 Census of Fatal Occupational Injuries. Information on nonfatal assaults and violent acts resulting in 1 or more days away from work was collected in the Survey of Occupational Injuries and Illnesses and cover 1992, the latest year for which the data are available. Selected characteristics for nonfatal injuries and illnesses that occurred in 1993 will be released in April 1995.

[7] *Counting Injuries and Illnesses in the Workplace: Proposals for a Better System* (National Research Council, National Academy Press, 1987).

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Table 8. Fatal occupational injuries and homicides by occupation, 1993.

Occupation[1]	All fatalities		Homicides	
	Number	Percent	Number	Percent
Total	6,271	100.0	1,063	100.0
Managerial and professional specialty	681	10.9	159	15.0
Executive, administrative, and managerial	427	6.8	122	11.5
Managers, food serving and lodging establishments	84	1.3	59	5.6
Managers, properties and real estate	19	.3	9	.8
Managers, service organizations, n.e.c.	15	.2	6	.6
Managers and administrators, n.e.c.	213	3.4	35	3.3
Professional specialty	254	4.1	37	3.5
Health assessment and treating occupations	32	.5	6	.6
Lawyers and judges	11	.2	6	.6
Lawyers	11	.2	6	.6
Technical, sales, and administrative support	842	13.4	399	37.5
Sales occupations	556	8.9	353	33.2
Supervisors and proprietors, sales occupations	247	3.9	178	16.7
Sales representatives, finance and business services	45	.7	14	1.3
Real estate sales occupations	11	.2	6	.6
Sales workers, retail and personal services	225	3.6	159	15.0
Sales workers, motor vehicles and boats	17	.3	7	.7
Sales counter clerks	24	.4	22	2.1
Cashiers	101	1.6	94	8.8
Administrative support occupations, including clerical	119	1.9	42	4.0
Secretaries, stenographers, and typists	18	.3	10	.9
Secretaries	18	.3	10	.9
Financial records processing occupations	8	.1	6	.6
Miscellaneous administrative support	21	.3	10	.9
General office clerks	13	.2	6	.6
Service occupations	539	8.6	211	19.8
Protective service occupations	288	4.6	122	11.5
Police and detectives, including supervisors	149	2.4	68	6.4
Police and detectives, public services	101	1.6	57	5.4
Sheriffs, bailiffs, and other law enforcement officers	28	.4	9	.8
Guards	100	1.6	54	5.1
Guards and police, except public service	86	1.4	53	5.0
Service occupations, except protective and household	243	3.9	84	7.9
Food preparation and service occupations	77	1.2	54	5.1
Waiters and waitresses	13	.2	9	.8
Cooks	17	.3	12	1.1
Food counter, fountain and related occupations	9	.1	7	.7
Miscellaneous food preparation occupations	15	.2	11	1.0
Health service occupations	16	.3	7	.7
Cleaning and building service occupations, except household	106	1.7	10	.9
Janitors and cleaners	83	1.3	9	.8
Personal service occupations	44	.7	13	1.2
Hairdressers and cosmetologists	7	.1	6	.6
Farming, forestry, and fishing	961	15.3	12	1.1
Other agricultural and related occupations	319	5.1	6	.6
Precision production, craft, and repair	1,095	17.5	65	6.1
Mechanics and repairers	317	5.1	29	2.7
Vehicle and mobile equipment mechanics, repairers, and supervisors	200	3.2	22	2.1
Automobile mechanics and aprentices	60	1.0	15	1.4
Construction trades	565	9.0	11	1.0
Construction trades, except supervisors	473	7.5	8	.8
Precision production occupations	116	1.8	23	2.2
Operators, fabricators, and laborers	1,959	31.2	203	19.1
Machine operators, assemblers, and inspectors	205	3.3	14	1.3
Transportation and material moving occupations	1,182	18.8	132	12.4
Motor vehicle operators	917	14.6	129	12.1
Truck drivers	731	11.7	23	2.2
Driver-sales workers	41	.7	7	.7
Taxicab drivers and chauffeurs	113	1.8	97	9.1
Handlers, equipment cleaners, helpers, and laborers	572	9.1	57	5.4
Freight, stock, and material handlers	81	1.3	20	1.9
Stock handlers and baggers	21	.3	18	1.7
Garage and service station related occupations	34	.5	22	2.1
Laborers, except construction	202	3.2	9	.8

[1] Based on the 1990 Occupational Classification System developed by the Bureau of the Census.

NOTE: Totals for major categories may include subcategories not shown separately. Percentages may not add to totals because of rounding.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1993.

Table 9. Fatal occupational injuries and homicides by industry, 1993

Industry[1]	All fatalities		Homicides	
	Number	Percent	Number	Percent
Total	6,271	100.0	1,063	100.0
Private industry	5,590	89.1	940	88.4
Agriculture, forestry and fishing	855	13.6	14	1.3
Construction	924	14.7	20	1.9
Special trades contractors	517	8.2	12	1.1
Manufacturing	762	12.2	45	4.2
Food and kindred products	82	1.3	7	.7
Transportation and public utilities	890	14.2	125	11.8
Local and interurban passenger transportation	130	2.1	100	9.4
Taxicabs	106	1.7	96	9.0
Trucking and warehousing	468	7.5	17	1.6
Trucking and courier services, except air	426	6.8	15	1.4
Trucking, except local	211	3.4	6	.6
Wholesale trade	250	4.0	24	2.3
Wholesale trade--durable goods	137	2.2	13	1.2
Wholesale trade--nondurable goods	113	1.8	11	1.0
Groceries and related products	42	.7	7	.7
Retail trade	784	12.5	519	48.8
General merchandise stores	26	.4	11	1.0
Department stores	14	.2	6	.6
Food stores	223	3.6	194	18.3
Grocery stores	199	3.2	175	16.5
Retail bakeries	11	.2	8	.8
Automotive dealers and service stations	138	2.2	69	6.5
Auto and home supply stores	22	.4	6	.6
Gasoline service stations	68	1.1	53	5.0
Apparel and accessory stores	23	.4	16	1.5
Family clothing stores	7	.1	6	.6
Furniture and homefurnishings stores	25	.4	10	.9
Radio, television, and computer stores	11	.2	8	.8
Eating and drinking places	199	3.2	144	13.5
Eating places	113	1.8	79	7.4
Drinking places	39	.6	33	3.1
Miscellaneous retail	118	1.9	70	6.6
Liquor stores	23	.4	18	1.7
Used merchandise stores	15	.2	11	1.0
Miscellaneous shopping goods stores	23	.4	15	1.4
Nonstore retailers	22	.4	10	.9
Retail stores, nec	16	.3	10	.9
Finance, insurance, and real estate	116	1.8	34	3.2
Insurance carriers	13	.2	7	.7
Real estate	64	1.0	20	1.9
Real estate operators and lessors	35	.6	10	.9
Real estate agents and managers	25	.4	9	.8
Services	758	12.1	153	14.4
Hotels and other lodging places	33	.5	9	.8
Hotels and motels	25	.4	8	.8
Personal services	30	.5	18	1.7
Laundry, cleaning, and garment services	12	.2	7	.7
Beauty shops	9	.1	8	.8
Business services	188	3.0	39	3.7
Miscellaneous business services	82	1.3	32	3.0
Detective and armored car services	44	.7	26	2.4
Automotive repair, services, and parking	116	1.8	22	2.1
Automotive repair shops	83	1.3	18	1.7
Motion pictures	23	.4	12	1.1
Video tape rental	10	.2	10	.9
Amusement and recreation services	77	1.2	9	.8
Miscellaneous amusement, recreation services	70	1.1	9	.8
Health services	65	1.0	14	1.3
Legal services	14	.2	8	.8
Social services	28	.4	6	.6
Government[2]	681	10.9	123	11.6
Federal (including resident armed forces)	186	3.0	18	1.7
State	146	2.3	20	1.9
Local	340	5.4	85	8.0
Public order and safety	128	2.0	40	3.8
Police protection	86	1.4	38	3.6

[1] *Standard Industrial Classification Manual*, 1987 Edition.
[2] Includes fatalities to workers employed by governmental organizations regardless of industry.

NOTE: Percentages may not add to totals because of rounding. There were 77 fatalities for which there was insufficient information to determine a specific industry classification, though a distinction between private and government was made for each. The total number of fatalities reported for 1992 has been revised and includes additional cases identified since its initial release.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1993.

Table 10. Fatal occupational injuries and homicides by selected worker characteristics, 1993

Characteristics	*All fatalities*		*Homicides*	
	Number	Percent	Number	Percent
Total	6,271	100.0	1,063	100.0
Employee status				
Wage and salary workers	4,981	79.4	781	73.5
Self-employed[1]	1,290	20.6	282	26.5
Sex and age				
Men	5,790	92.3	875	82.3
Women	481	7.7	188	17.7
Both sexes:				
Under 16 years	29	.5	6	.6
16 to 17 years	39	.6	11	1.0
18 to 19 years	101	1.6	16	1.5
20 to 24 years	502	8.0	89	8.4
25 to 34 years	1,510	24.1	291	27.4
35 to 44 years	1,576	25.1	292	27.5
45 to 54 years	1,193	19.0	191	18.0
55 to 64 years	801	12.8	107	10.1
65 years and over	514	8.2	60	5.6
Race				
White	5,106	81.4	694	65.3
Black	664	10.6	169	15.9
Asian or Pacific Islander	190	3.0	120	11.3
American Indian, Aleut, Eskimo	47	.7	6	.6
Other	263	4.2	74	7.0
Hispanic origin				
Hispanic[2]	604	9.6	178	16.7

[1] Includes paid and unpaid family workers, and may include owners of incorporated businesses, or members of partnerships.

[2] Persons identified as Hispanic may be of any race.

NOTE: Percentages may not add to totals because of rounding.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1993.

Table 11. Nonfatal assaults by persons resulting in days away from work by selected characteristics, private wage and salary workers, 1992

Characteristic	Nonfatal assaults
Number of cases	22,396
Percent	100
Sex	
Men	44
Women	56
Age	
Under 20 years	20
25 to 34 years	32
35 to 44 years	25
45 to 54 years	12
55 to 64 years	5
65 and over	1
Not reported	5
Race or ethnic origin	
White, non-Hispanic	47
Black, non-Hispanic	14
Hispanic	6
Asian or Pacific Islander	6
Not reported	26
Occupation	
Service occupations	47
Nurses aides, orderlies	30
Guards, police (private)	8
Technical, sales, and administrative support	22
Cashiers	5
Licensed practical nurse	4
Managerial and professional specialty	18
Registered nurse	4
Operators, fabricators, and laborers	11
Truck drivers	4
Other	2
Industry	
Services	64
Health services	40
Nursing homes	27
Hospitals	11
Social services	13
Retail trade	21
Grocery stores	6
Eating and drinking places	5

Characteristic	Nonfatal assaults
Number of cases	22,396
Percent	100
Industry—Continued	
Transportation and public utilities	4
Finance, insurance, and real estate	4
Manufacturing	3
Wholesale trade	2
Other	2
Event	
Hitting, kicking, beating	47
Squeezing, pinching, scratching, twisting	11
Biting	4
Shooting	3
Stabbing	2
All other specified acts	23
Unspecified	10
Source of injury[1]	
Persons	82
Health care patient	45
Co-worker, former co-worker	6
Other person, e.g., visitor, robber	31
Other sources of injury	19
Nature of injury	
Sprains, strains	24
Bruises, contusions	24
Cuts, lacerations, puncture wounds	7
Fractures	5
Multiple injuries	8
Other	31
Part of body affected	
Trunk	26
Back	9
Shoulder	5
Upper extremities	21
Wrist	6
Finger	5
Head	19
Multiple[2]	19
Lower extremities	7
Other	8

1 The source of injury identifies the object, substance, bodily motion, person, or exposure which directly produced or inflicted the injury.

2 Includes cases where more than one major body part were affected, such as an arm (upper extremities) and a leg (lower extremities).

NOTE: Because of rounding and nonclassifiable responses, data may not sum to totals.

SOURCE: Survey of Occupational Injuries and Illnesses, U.S. Department of Labor, Bureau of Labor Statistics, 1992.

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An Evaluation of the Census of Fatal Occupational Injuries as a System for Surveillance

Greater dissemination of CFOI data may lead to better prevention of injuries

Connie Austin

The Census of Fatal Occupational Injuries (CFOI), a surveillance system administered by the Bureau of Labor Statistics (BLS), was established nationally in 1992. It is designed to collect information on all fatal occupational injuries in the United States. An evaluation of the system was conducted in 1994 using guidelines developed by the Centers for Disease Control and Prevention (CDC). Although the CFOI program meets its stated objective of providing comprehensive, timely, and verifiable fatality information, improvements could be made in the dissemination and use of CFOI data and reports. Specifically, the CFOI could be improved by using the data in analytic epidemiology studies and publishing them in peer-reviewed journals.

Background

In 1991, the CFOI began to track fatal occupational injuries and illnesses in 32 States, and in the remaining States the following year. In each of the first 2 years of national CFOI data collection, more than 6,000 fatal workplace injuries were reported, a rate of approximately 5 fatalities per 100,000 workers per year.[1,2]

Since the majority of fatal occupational injuries occur in workers between 25 and 54 years of age, resulting in a high number of "years of potential life lost,"[3] information from a surveillance system, such as the CFOI, can be used to identify high-risk occupations and activities within occupations and to develop workplace safety programs.

Systematic evaluation of a surveillance system can help determine whether the stated objectives are being met. Areas can then be identified in which improvements can be made. In 1994, the Illinois Department of Health conducted an evaluation of the fatal injury component of the CFOI program, using guidelines established by the CDC for evaluating surveillance systems.[4] The evaluation included a description of the system and its objectives, an assessment of the seven attributes of a surveillance system and its resource requirements, and finally, recommendations for the system.

Description of the system

The primary objective of the CFOI system is to collect information on fatal occupational injuries that is comprehensive, timely, and verifiable.[5]

The CFOI system is a passive surveillance system and is a cooperative venture between BLS and State agencies. The system is administered by the States, which collect, code, and verify fatality data. BLS provides reports from Federal agencies, such as the Occupational Safety and Health Administration (OSHA), the Mine Safety and Health Administration, and the Employment Standards Administration, to CFOI personnel in each State; collects data from each State; reviews each fatality; and assembles national data.

Fatality data are gathered by State personnel from workers' compensation reports, death certificates, news stories, and other sources. State CFOI personnel routinely review these to identify and collect information on workplace fatalities. They are trained by BLS in computer software use and coding of data elements for the CFOI program.

After receiving an initial fatality report, CFOI staff search for additional documentation to verify the fatality. This may include requesting reports from coroners and medical examiners or doing a follow-up questionnaire with the employer. The information is then coded and entered into a database. BLS receives final data on all fatalities in June of the following year. Following a review of the data, BLS compiles the national dataset.

To determine whether a fatality is work-related, State personnel use a case definition that stipulates that "the decedent must have been employed (that is, working for pay, compensation, or profit or in the family business) at the time of the event and engaged in a legal work activity or present at the site of the incident as a requirement of his or

[1] *Fatal Workplace Injuries in 1992: A Collection of Data and Analysis*, Bureau of Labor Statistics, Report 870, April 1994, pp. 1-92.

[2] Guy Toscano and Janice Windau, "The Changing Character of Fatal Work Injuries," *Monthly Labor Review*, October 1994, pp. 17-28.

[3] C.A. Bell, N.A. Stout, T.R. Bender, C.S. Conroy, W.E. Crouse, and J.R. Myers, "Fatal Occupational Injuries in the United States, 1980-1985," *Journal of the American Medical Association*, 1990, vol. 263(22), pp. 3047-50.

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[4] "Guidelines for Evaluating Surveillance Systems," *Morbidity and Mortality Weekly Report*, Centers for Disease Control, vol. 37(S-5), 1988.

[5] *Census of Fatal Occupational Injuries State Operating Manual*, Bureau of Labor Statistics, February 1994.

her job."[6] Suicides and homicides meet the case definition if they occur at work. Fatalities that occur while traveling to and from work (commuting) are not considered work-related.

In general, each fatality must be verified by two source documents. In those instances where a second source document cannot be located, the fatality is included only if sufficient information exists from the first source to determine that the fatality was work-related.

Up to 30 injury data elements are included in the national CFOI dataset, including demographic information about the deceased, employer information, and data elements related to the circumstances of the injury. To preserve confidentiality, files released to researchers do not include personal identifiers, location (State of occurrence), source document information, or information on alcohol or drug testing results.

Data elements that are collected must be applicable to all types of fatalities and are kept simple. Because of this, information that might be useful for particular areas of study may not be available. For example, when examining fatalities caused by motor vehicle crashes, it would be useful to have information on seatbelt use and the estimated speed of the vehicle at the time of the crash. However, this same type of information would not be useful for burns or falls. Even in cases where some information relevant to a particular type of injury, such as seatbelt use, may be included in a narrative description of the injury, this information may not be available for the majority of the fatalities in that category.

Evaluating the system

The seven major attributes of a surveillance system, according to the CDC guidelines, are simplicity, flexibility, acceptability, sensitivity, predictive value positive, representativeness, and timeliness.

Simplicity. The simplicity of a surveillance system involves both the structure and ease of operation. In the CFOI system, data entry is facilitated through the use of the CFOI State operating manual which provides clear information on coding of data elements. The data then are easily transferred electronically from the State to BLS. The national research file is easy to distribute because data for each year can fit on a standard diskette, which can be sent to individuals who have received approval to use the data for study.

The most complex part of the CFOI program is the wide variety of reporting sources that must be used to ascertain and verify all occupational fatalities and provide detailed information on the fatalities. Several studies have shown that no single data source can identify all occupational fatalities.[7] In addition, one source document alone is usually insufficient to provide all the information needed to adequately describe a fatality.[8] In 1993, an average of three source documents were used to verify each fatality.[9] Source documents, which varied from State to State, included death certificates (which identified 72 percent of fatalities in CFOI in 1992); medical examiner, coroner, or autopsy reports (62 percent); workers' compensation documents (40 percent); news clippings (34 percent); and OSHA reports (32 percent). Restricting the number or types of data sources used in the system might simplify its operation but would likely limit the system's ability to identify and report fatalities.

Flexibility. Flexibility in a surveillance system occurs when a system can easily adapt to changing information needs or operating conditions. The CFOI system has not been in existence long enough to assess its flexibility in a meaningful fashion. Some flexibility is evident, however, when sources for fatality data from States are examined. In 1992, "other" source documents were used to identify 33 percent of fatalities; in 1993, other sources were used to identify 61 percent of fatalities.[2,10] This finding suggests that the system is evolving and that State CFOI personnel are becoming more familiar with accessing new source documents, such as farm bureau and highway reports, to identify fatalities. The CFOI should be evaluated in the future to assess its ability to adapt to changing work conditions, such as more individuals working at home.

Acceptability. The acceptability of a surveillance system means the number of individuals and organizations that willingly participate in the system. A measure of the CFOI system's acceptability is that all 50 States participate in the program, each State meets the data deadlines set by BLS, and the required data elements are virtually always furnished. (See Tables 1 and 2).

Sensitivity. Sensitivity measures the proportion of all occupational fatalities (using the case definition) that are detected by the CFOI system. While it was not possible to calculate sensitivity because the total number of occupational fatalities is unknown, the sensitivity of the CFOI system is probably high because multiple data sources are used to ascertain events. Comparatively, it is a more complete system than those which only use death certificate infor-

[6] See *Fatal Workplace Injuries*, BLS Report 870.

[7] N. Stout, C. Bell, "Effectiveness of Source Documents for Identifying Fatal Occupational Injuries: A Synthesis of Studies," *American Journal of Public Health*, 1991, vol. 81(6), pp. 725-7. J. Russell, C. Conroy, "Representativeness of Deaths Identified Through the Injury-at-Work Item on the Death Certificate: Implications for Surveillance," *American Journal of Public Health*, 1991, vol. 81(12), pp. 1613-18. D.J. Murphy, B.L. Seltzer, and C.E. Yesalis, "Comparison of Two Methodologies to Measure Agricultural Occupational Fatalities," *American Journal of Public Health*, 1990, vol. 80(2), pp. 198-200.

[8] D.M. Gute and J.P. Fulton, "Agreement of Occupation and Industry Data on Rhode Island Death Certificates with Two Alternative Sources of Information," *Public Health Reports*, 1985, vol. 100(1), pp. 65-72.

[9] See *Fatal Workplace Injuries*, BLS Report 870.

[10] Guy Toscano and Janice Windau, "The Changing Character of Fatal Work Injuries," *Monthly Labor Review*, October 1994, pp. 17-28.

mation. Surveillance systems which use only one source of fatality information, such as death certificates, have been shown to miss fatalities.[11]

Predictive value positive. Predictive value positive (PVP) is the proportion of events identified by CFOI as occupational fatalities that actually met the case definition for occupational fatalities. It is not possible to measure PVP directly because of the confidentiality of source documents. Approximately three-quarters of the cases reported to CFOI have a death certificate as one of their source documents; and in a previous study of Indiana work-related fatalities, death certificates alone were found to give a false positive rate of only 3 percent.[12] For CFOI case reports not based on death certificate reporting, double-source reporting may be effective in maintaining a high PVP.

Representativeness. The CDC guidelines for evaluation of surveillance systems define representativeness as accurately describing a health event over time and in describing the distribution of the population by place and person. Because of its reliance on multiple data sources, the CFOI system is probably the most representative surveillance system for fatal occupational injuries. The system is comprehensive in its coverage of certain groups of workers, including workers younger than 16 years of age, workers not covered by the Occupational Safety and Health Act, workers on small farms, and government employees. In addition, illegal aliens should be represented in the system, since death certificates are issued for anyone dying in the United States. However, it may underestimate fatalities of self-employed workers, who are not represented in workers' compensation or OSHA reports.

Timeliness. Timeliness of a surveillance system reflects the delay between steps in the system. The national CFOI research file is available for use about 13 months after the reference year. This amount of time is needed to permit States to revise reports of individual fatalities with newly available information and to allow BLS to review information on each fatality.

Resources for the program

Both Federal and State funds are used to operate the CFOI program. Nationally, the CFOI system costs $1.2 million; the States contribute another $1.2 million for the illness and injury component of the CFOI program.

[11] See Stout and Bell, "Effectiveness of Source Documents for Identifying Fatal Occupational Injuries;" Russell and Conroy, "Representativeness of Deaths Identified Through the Injury-at-Work Item on the Death Certificate: Implications for Surveillance;" and Murphy, Seltzer, and Yesalis, "Comparison of Two Methodologies to Measure Agricultural Occupational Fatalities," *American Journal of Public Health.*

[12] See Toscano and Windau, "The Changing Character of Fatal Work Injuries" for information on source documents used to compile the 1993 national fatality data. Also see, "An Evaluation of Certificates of Death as a Source of Data on Fatal Work Injuries: The Indiana Experience," in *Fatal Work Injuries in 1991: A Collection of Data and Analysis*, Bureau of Labor Statistics, Report 845, April 1993, pp. 30-33.

Usefulness of the system

The CFOI program produces a news release approximately 8 months after the reference year and an annual report of occupational fatalities, with periodic reports appearing in other BLS publications.[13] The annual report provides descriptive statistics on the percent of fatalities by State and within demographic groupings, as well as selected State and regional reports. Several States and BLS regional offices also publish fatality data.[14] When possible, fatality rates are calculated for various industries. Investigators use the data for descriptive studies of industry-specific fatality rates, for studies on the various causes of fatalities stratified by sex; and for comparison of occupational fatality rates in self-employed versus other workers. Although such findings may be insufficient to directly target specific prevention measures, they do provide information that can be useful in monitoring trends in occupational fatalities and in bringing focus to particularly high-risk occupations or industries.

Conclusions

The high levels of acceptability, timeliness, and representativeness of the CFOI system represent an improvement over other occupational fatality recording systems. Multiple reporting sources may contribute to high sensitivity and predictive value positive, although neither of these could be directly calculated. The flexibility of the system can be better evaluated after the system has been in operation longer. Although the simplicity of the system is affected by the use of multiple source documents, this approach allows for the most complete collection of fatalities possible.

One area in which CFOI can improve its surveillance system is in dissemination of information. While CFOI publications are sent to more than 5,000 organizations, the distribution of information to the general medical and injury prevention audience has been somewhat limited. In the future, a wider dissemination of both CFOI data files and CFOI printed information could lead to increased use of the system for prevention purposes. Currently, BLS publishes an annual CFOI report, which includes reprints of

[13] See *Fatal Workplace Injuries*, BLS Report 870 and Toscano and Windau, "The Changing Character of Fatal Work Injuries."

[14] *Census of Fatal Occupational Injuries, New Jersey-1992*, Division of Epidemiology, Environment and Occupational Health Services, New Jersey Department of Health, February 1994, pp. 1-26. *Missouri Monthly Vital Statistics-Focus*, The Census of Fatal Occupational Fatalities, Missouri Department of Health, 1993. *Report of Occupational Injuries in Maine, 1992*, Maine Department of Labor, 1993, BLS 672, pp. 1-7. *Massachusetts Traumatic Deaths at Work, 1992 Update*, Massachusetts Department of Public Health, 1994. *Census of Fatal Occupational Injuries in Arkansas, 1992*, Arkansas Department of Labor, pp. 1-15. *Fatal Occupational Injuries in Washington State, 1992: Results of the 1992 Census of Fatal Occupational Injuries*, Washington State Department of Labor and Industries, March 1994, pp. 1-41. *Census of Fatal Occupational Injuries for the State of Wisconsin, 1992*, Workers' Compensation Division, Department of Industry, Labor and Human Relations, Wisconsin, December 1993, pp. 1-10. *Census of Fatal Occupational Injuries: Results for North Dakota, 1992*, Bulletin R-1027, Bureau of Labor Statistics (Kansas City regional office), U.S. Department of Labor, pp. 1-11. *Census of Fatal Occupational Injuries, Fatal Work-related Injuries Arizona, 1991 & 1992*, Industrial Commission of Arizona, July 1994, pp. 1-13.

articles using CFOI data. Broader distribution of CFOI publications and data to those who need the information—such as injury researchers, industry and business leaders, worker and union groups, and manufacturers of workplace equipment—would be an important improvement in the CFOI system. In turn, this might influence individuals and groups to focus additional research on particular high-risk occupations, to incorporate changes in the manufacturing of equipment, or to institute new regulations and rules concerning workplace safety. Broader distribution could be achieved by publishing reports in peer-reviewed journals or the CDC's *Morbidity and Mortality Weekly Report*, which have a wider readership than the annual CFOI publication.

In the future, as more data are collected, analytic epidemiologic studies should be performed to identify risk factors for specific types of occupational fatalities. These studies can be performed by epidemiologists working in the States, in universities, or at the National Institute for Occupational Safety and Health. The results of these studies could be submitted for publication to appropriate peer-reviewed journals such as the *American Journal of Public Health*, *American Journal of Industrial Medicine*, *Scandinavian Journal of Work and Environmental Health*, *Journal of Occupational Medicine*, and *Accident, Analysis, and Prevention*.

Subsequent evaluations of the CFOI system after several more years of operation may reveal additional areas in which refinements can be made. Overall, the CFOI system meets its objectives of providing timely, comprehensive, and verifiable occupational injury data and it provides this information at a relatively low cost, $300 per fatality reported.[15] However, the ultimate usefulness of a surveillance system for fatal occupational injuries should be determined by its effectiveness in preventing or controlling fatalities. In the coming years, this may be the area in which BLS should concentrate its efforts to improve the CFOI system.

[15] Reported fatalities include some fatal occupational illnesses such as asbestosis and occupational cancers and other conditions, such as heart attacks and strokes that occur at work. Information on illness-related deaths are generally not included in published fatality Census counts because of the difficulties in compiling a complete count.

Table 1. Completeness of reporting demographic and employer characteristics, 1992

Data element[1]	Required (R) or Optional (O)	Percent complete
Demographic information		
Age	R	100
Race	R	100
Hispanic	O	90
Gender	R	100
Foreign birth	O	10
Region	R	100
Employer information		
Ownership	R	99.9
Establishment size	R	32
Industry code	R	98.9
Occupation code	R	99.5
Employee status	R	100
Length of time with employer	O	33

[1]Three data elements—record number, reference year, and whether the incident was an injury or illness were excluded from the tables.

Table 2. Completeness of reporting data on the fatal incident, 1992

Data element[1]	Required (R) or Optional (O)	Percent complete
Month/day of the week of injury	R	100
Rural or urban	O	100
Days survived	R	100
Body part affected	R	98.6
Source of injury	R	100
Secondary source	O	59
Event or exposure	R	100
Nature of injury	R	99.6
Cause of injury	O	36
Worker activity code	R	86
Location type	O	92
Time of occurrence	O	83
Narrative of how injury occurred	R	100

[1]Three data elements—record number, reference year, and whether the incident was an injury or illness—were excluded from the tables.

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Self-Employed Individuals Fatally Injured at Work

Individuals working for themselves, especially on farms and in retailing, typically face a higher risk of fatal injury than do their wage and salary counterparts

Martin E. Personick and Janice A. Windau

Working for oneself can be rewarding for individuals who place a high value on controlling the nature and pace of their efforts, even though earnings may be unpredictable. Being self-employed, however, can carry considerable safety risks and responsibilities, such as tackling hazardous work activities without adequate resources for safety training and equipment and without the oversight and guidance of Federal safety regulations. In 1993, the latest year for which data are available, the self-employed as a group made up about 1 in every 5 fatal injuries at work, double their one-tenth share of the American work force.[1] And certain groups of the self-employed, such as older workers in farming occupations and proprietors of bars, restaurants, and repair shops, faced an especially high risk of dying on the job.

This article analyzes information on the self-employed fatally injured at work, such as their occupation, demographic characteristics, the industry in which they worked, and the circumstances surrounding their death. The Bureau's Census of Fatal Occupational Injuries (CFOI) cross-references death certificates, newspapers, and other reports to verify that fatal injuries were work related and to obtain information on the "who and how" of each incident. Of the 6,271 fatal work injuries in 1993, BLS identified 1,191 as self-employed individuals, 4,981 as wage and salary workers, and 99 others as primarily family workers.[2]

The self-employed at a glance

Although some counts of the self-employed date back to the late 19th century, the 1940 Decennial Census marks the beginning of systematic efforts to count and profile them. In 1940, there were nearly 10 million self-employed persons operating unincorporated businesses, nine-tenths of whom were men, working mainly in agriculture, forestry, and fishing.[3]

In 1993, the unincorporated self-employed still numbered about 10 million, but their characteristics and share of the work force had changed dramatically. In 1940, the self-employed were about 20 percent of the civilian work force; now they are 9 percent of a much larger labor pool. Services industries, moreover, have replaced agriculture as the leading industry of the self-employed, accounting for two-fifths of that group's workers in 1993. And although the share of self-employed women has grown from a tenth of all self-employed in 1940 to a third in 1993, that's still lower than their 45-percent share of all workers.[4]

The employment characteristics of today's self-employed differ in many respects from those of wage and salary workers. These differences explain, in part, why their fatality profiles differ from that of their wage and salary counterparts and why the self-employed appear to be at a comparatively high risk of fatal occupational injury.

The self-employed tend to be older than wage and salary workers, a pattern evident over many decades.[5] This difference is especially noteworthy for workers in the oldest age group because they face a relatively high risk of fatal injury.[6] In 1993, about a fifth of the self-employed were age 55 and over, double the proportion of wage and salary workers in this age category. The difference is even more pronounced within agriculture, where older workers are fully a third of all the self-employed but just a tenth of all wage and salaried workers.

Most self-employed and wage and salary workers work in service-producing industries, where, with a few notable exceptions such as transportation, the risk of fatal injury is

[1] The Current Population Survey (CPS), conducted for the Bureau of Labor Statistics by the Bureau of the Census, estimates about 10 million self-employed operated unincorporated businesses in 1993. In addition, there were about 3 to 4 million *incorporated* self-employed that year counted in the CPS as "other wage and salary workers." The self-employed as a percent of the total work force (about 120 million in 1993) increases slightly to almost an eighth if both groups of self-employed are combined, still less than their share of all fatal injuries at work.

[2] For a comprehensive account of the 1993 BLS census, see Guy Toscano and Janice Windau, "The Changing Character of Fatal Work Injuries," *Monthly Labor Review*, October 1994, pp. 17-28.

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[3] See Joseph D. Phillips, *The Self-Employed in the United States*, University of Illinois Press, 1962, p. 28.

[4] See Phillips, *The Self-Employed* for 1940 data and the Current Population Survey, for 1993 Annual Averages.

[5] For an analysis of age differences between the self-employed and workers paid wages and salaries, see Eugene H. Becker, "Self-employed Workers: An Update to 1983, "*Monthly Labor Review*, July 1984, pp. 14-18. Current data are from the CPS, 1993 Annual Averages.

[6] The fatality rate was 7 per 100,000 workers, aged 55 to 64 and 15 per 100,000 workers, 65 years and older. These compare with a rate of 5 per 100,000 workers, ages 25 to 34. For more information on serious injuries affecting older workers, see Martin Personick and Janice Windau, "Characteristics of Older Workers' Injuries on the Job," *Fatal Workplace Injuries in 1993: A Collection of Data and Analysis*, BLS Report 891, May 1995.

relatively low for both. However, staffing patterns within three goods-producing industries illustrate why the self-employed as a group face a relatively higher risk of fatal injury. Agriculture, the industry with the highest rate of fatal injury for all workers, accounted for 13 percent of the self-employed but just 2 percent of wage and salary workers. Construction, another high risk industry, engaged proportionately more of the self-employed (about a sixth) than of all wage and salary workers (one-twentieth). And manufacturing, an industry with a relatively low risk of fatal injury, accounted for a smaller share (one-twentieth) of the self-employed than its one-fifth share of all wage and salary workers.

About half of all self-employed and wage and salary workers held a white-collar job either within the broad occupational grouping of "managerial and professional specialty" or the classification, "technical, sales, and administrative support." Both groups have a relatively low risk of fatal injury. Within these groups, however, are two occupations—managers of food serving and lodging establishments and sales supervisors and proprietors—for which there is an elevated risk of death resulting from homicide. Together, those two jobs made up a larger share (one-eighth) of the self-employed than of wage and salary workers (one-twentieth). The employment total for self-employed also includes relatively large shares of farmers and construction tradesworkers, two other occupations with high rates of fatal injury. But proportionately more wage and salary workers (about 15 percent) than self-employed ones (about 5 percent) were "operators, fabricators, and laborers," a comparatively high risk group that includes, motor vehicle operators and construction laborers.

Self employed workers typically work longer hours than do wage and salary workers and earn less. The following tabulation shows the disparity between the two groups in average hours worked per week during 1993 for those on full-time schedules[7]:

	Average weekly hours	
	Self-employed	*Wage and salary*
Agricultural industries	54	47
Nonagricultural industries	48	43

The disparity is even more striking when one looks at the percentage of workers who logged more than 48 hours a week:

	Percent working more than 48 hours	
	Self-employed	*Wage and salary*
Agricultural industries	60	37
Nonagricultural industries	46	23

Thus the average self-employed worker is exposed to work hazards for a longer period of time and also may be more subject to the effects of fatigue while operating a vehicle or hazardous machinery.[8] Finally, self-employed individuals typically earn less than their wage and salary counterparts and, thus, have few extra resources to spend on safety education and equipment often provided by employers at little or no cost to their employees.[9]

The self-employed fatally injured

The 1993 CFOI counted 1,191 fatalities among self-employed individuals who had been working either on a primary or a secondary job at the time of their death. Although it was designed to count only "the unincorporated" as self-employed, the BLS fatality census also may include in its self-employed count some owners of incorporated businesses and members of partnerships if their corporate status could not be ascertained through normal data collection efforts. Thus, coverage of the self-employed in the BLS census is somewhat broader than the Current Population Survey's definition of self-employed workers (unincorporated, primary job only). Because of these differences, fatality rates for the self-employed and for wage and salary workers by various demographic and case characteristics are not included in this article.[10]

Still, much can be learned about the relative fatality risks of the self-employed by identifying the leading ways in which they died, the primary industries and occupations where the fatal injury occurred, and the age group of the self-employed fatally injured. Tables 1 through 3 profile these characteristics both for the self-employed and for wage and salary workers, revealing several important differences in fatality patterns between the two.

Fatal event and exposure. Work-related homicide led all other fatal event and exposure categories for the self-employed and ranked second to highway incidents for the wage and salary worker. (See table 1.) Homicide accounted for a larger share of fatal injuries among the self-employed (22 percent) than among wage and salaried workers (16 percent).[11] The self-employed also were more likely to die at

[7] The hours at work data are from unpublished tabulations of Current Population Survey, 1993 Annual Averages.

[8] See "Truck Driver Fatigue Focus of Study; Revised Federal Drive Time Limits Possible," *Occupational Safety and Health Reporter*, Bureau of National Affairs, October 23, 1991, p. 3.

[9] For a discussion of earnings levels by class of worker, see Theresa J. Devine, "Characteristics of Self-employed Women in the United States," *Monthly Labor Review*, March 1994, especially pp. 29-32.

[10] Even when the incorporated self-employed and individuals who work as wage and salary workers in their primary job but who are self-employed in their second job are included in the self-employed's employment figures, the fatality share for the self-employed is greater than their employment share. The gap narrows somewhat between the self-employed and wage and salary workers when the longer hours of the self-employed are considered.

[11] Because the overall fatality rate is higher for the self-employed than for wage and salaried workers, the risk premium for the self-employed is somewhat larger than the overall premium for fatal event and exposure categories that make up an equal or larger share of all self-employed fatalities than of wage and salaried workers. For example, assume that the overall fatality rate for the self-employed is 10 per 100,000 self-employed and 5 per 100,000 for wage and salary workers. Applying the homicide shares to each overall rate, the 22-percent share for the self-employed results in a homicide rate of 2.2 per 100,000 self-employed; the 16-percent share for wage and salaried workers results in a 0.8 rate per 100,000 workers.

Moreover, the self-employed may also face a relatively higher risk for certain other events and exposures, like fatal falls, when such events are a slightly larger share of the wage and salary fatality total than of self-employed workers' fatality total. Using the same overall fatality rates, the self-employed fatality rate for falls would be about 0.8 per 100,000 workers (8 percent of an overall rate of 10 per 100,000 workers), compared with 0.5 for wage and salaried workers (10 percent of a rate of 5 per 100,000 workers).

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work of a self-inflicted injury than were wage and salary workers.

Nonhighway fatalities, except rail, air, and water incidents, were the second leading way in which the self-employed died at work. Many happened on farms and commonly involved tractors and other farm vehicles overturning on their drivers or occupants falling from and being struck by such vehicles. As a whole, the category accounted for 14 percent of the fatalities suffered by self-employed and 4 percent of those suffered by wage and salary workers, according to the 1993 BLS census.

Highway incidents and persons struck by objects other than vehicles or mobile equipment each accounted for a tenth of the fatality total for the self-employed. About half of the highway fatalities resulted from collisions between vehicles or mobile equipment; most of the rest were noncollision incidents resulting from vehicles jackknifing, overturning, or running off the highway. Falling objects, such as trees and construction materials, also pose a notable hazard for the self-employed. Unlike the other major categories of fatal events, highway incidents appear to pose a lower fatality risk for the self-employed than for wage and salary workers.

Occupation. Farm operator and manager was, by far, the occupation with the largest number of self-employed fatal injuries reported by the 1993 BLS census. (See table 2.) This category accounted for three-tenths of the 1,191 self-employed fatalities, triple its one-tenth share of the 10 million unincorporated self-employed reported in the 1993 Current Population Survey. The following tabulation shows the various types of fatal events and exposures that occurred to the fatally injured self-employed in farming and other agricultural occupations such as groundskeepers and gardeners:

Number of farming fatalities	413
Percent of total	100
Transportation incident	49
Nonhighway (e.g., tractor rollover)	34
Other	15
Contact with object or equipment	34
Struck by object	17
Caught in or compressed by equipment or object	13
Other	4
Exposure to harmful substance or environment	7
All other events	10

Sales occupations accounted for about one-sixth of all self-employed fatalities. Most of the fatalities to self-employed sales workers were robbery-related homicides involving shopkeepers and other proprietors of small businesses. Sales supervisor and proprietor was an especially risky occupation for the self-employed, accounting for 13 percent of all their fatal work injuries compared with about 8 percent of the employment total for the unincorporated self-employed. By contrast, this job classification had roughly the same share (about 2 percent) of both the fatality and employment totals for wage and salary workers.[12]

The classification "executive, administrative, and managerial" is the remaining occupational group having at least a tenth of the fatality total for the self-employed. Like sales occupations, many in this group were homicide victims; but most were not, as the following tabulation shows:

Number of fatalities to executives, administrators, and managers	168
Percent of total	100
Assault and violent act	45
Homicide	35
Self-inflicted injury	10
Transportation incident	19
Highway	9
Aircraft	5
Other	5
Contact with object or equipment	14
Fall	11
Exposure to harmful substance or environment	9
Other	2

Other characteristics. Over nine-tenths of fatally injured self-employed and wage and salary workers were men, well above their shares of the Nation's employment.(See table 3.) Men are fatally injured more often than women primarily because of differences in the jobs men and women hold. By race, whites dominate employment and fatality counts, but Asians, Pacific Islanders, and races other than white or black appear to have a higher risk of a fatal injury on the job.[13] A partial explanation for their higher risk may be that, compared to blacks and whites, they are disproportionately employed in jobs in which the risk of violent death is relatively high. Homicide accounted for four-fifths of fatal on-the-job injuries to the self-employed who were not black or white and for about half of the wage and salary workers of these minorities. In contrast, homicide accounted for 22 percent of all fatal occupational injuries for the self-employed and 16 percent of such injuries for wage and salary workers. (See table 1.)

As mentioned earlier, older workers face a higher risk of fatal injury than do younger workers. This is especially true for the self-employed, 55 years and older. They made up over two-fifths of all fatally injured self-employed workers in 1993, well above their one-fourth share of all employment for the unincorporated self-employed. Self-employed workers 65 years and older faced an even higher fatality risk, accounting for nearly a tenth of the employment but nearly a fourth of the fatal injuries of the self-employed. Wage and salary workers also face higher risks with increasing age.

[12] Employment by occupation and class of worker appears in unpublished tabulations from the Current Population Survey, 1993 annual averages.

[13] Employment by race and class of worker appears in unpublished tabulations from the Current Population Survey, 1993 annual averages. The tabulations show that races other than white or black were 4 percent of the self-employed and 2 percent of the wage and salary employment totals that year. Shares of fatal work injuries held by "races other than white or black" were well above their employment shares in 1993.

Agricultural industries, which include crop and livestock production as well as services performed on a contract or fee basis, such as crop harvesting, veterinary medicine, and landscaping, accounted for more fatalities among the self-employed than any of the other major industry divisions. (See table 3.) Although agricultural activities account for only about one-eighth of the employment total for self-employed workers, it accounts for about a third of their fatal work injuries. Agricultural wage and salary workers also face fatality risks much higher than their 2-percent share of wage and salary employment would suggest. Interestingly, workers 55 years and older are a clear majority of the self-employed fatally injured in agricultural industries, but are a small fraction of wage and salary workers dying in that industry.

Retail trade establishments, such as grocery stores and restaurants, had contrasting risk patterns by class of worker. Their share of the self-employed fatally injured (18 percent) was slightly larger than their 15-percent share of the unincorporated self-employed in 1993. But wage and salary workers in retail trade faced below-average risks of fatal injury with an 11-percent share of the wage and salary fatality total but a 17-percent share of wage and salary employees. Part of the difference may reflect the elevated risk of robbery-related homicide the self-employed in retail businesses face when they work alone during evening hours.

Services industries are relatively safe workplaces both for the self-employed and for wage and salary workers. They are about one-eighth of each group's total fatality count, well below their shares (ranging from 25 to 40 percent) of each group's employment totals. For the self-employed, "automotive repair, services, and parking" was the services industry reporting the most fatal injuries in 1993, 44 out of 147 deaths in all services. For wage and salary workers, business services, such as armored car and personnel supply firms, led all other services industries; they reported 172 out of 604 service industry deaths.

Like retail trade, construction industries manifest contrasting risk patterns by class of worker. But in the construction industry, it is the wage and salary worker, rather than the self-employed individual, who faces relatively high fatality risks on the job.[14] Construction makes up 16 percent of all wage and salary workers fatally injured, triple its 5-percent share of the employment total for that worker group. By contrast, the industry's share of the self-employed fatally injured (11 percent) was slightly lower than its 15-percent employment share.

Relatively low fatality risks for the self-employed in construction partly reflect their favorable mix of relatively safe construction work, such as carpentry and painting.[15] Differences in work experience and the amount of actual construction work performed are other factors that might help explain why the self-employed in the construction industry typically face a lower risk of fatal injury than do the wage and salaried worker, even within the same trade.

Summary findings

Data from the 1993 Census of Fatal Occupational Injuries and 1993 Current Population Survey show that the self-employed as a group sustain a larger share of all fatal work injuries than their share of total employment would suggest. Compared to wage and salary workers, the relatively high risk of fatal injury for the self-employed as a group reflects several factors, working singly and in combination, including their disproportionate employment in hazardous industries like agriculture and their tendency to be older. In construction, the fact that the self-employed appear to be at less risk than wage and salary workers offsets in part the industry's contribution to the risk differences between the two classes. Many occupational groups of the self-employed also tend to be at relatively high risk, especially farmers and shopkeepers.

The Census of Fatal Occupational Injuries contains rich sets of information about how deadly incidents occur. Such deadly patterns differed by class of worker. The self-employed were more likely to be homicide victims than were wage and salary workers. The next most common ways in which the self-employed died at work were tractor rollovers and other nonhighway events, being struck by trees and other nonvehicular objects, and highway incidents. Highway incidents led all others for wage and salary workers, followed by homicides, being struck by objects, and falls from elevations. Safety and health practitioners who study these differences should gain valuable insights into ways to improve the safety and health of both the self-employed and their wage and salary counterparts.

Technical Notes

Definitions. For a fatality to be considered within the scope of the program, the decedent must have been employed (that is, working for pay, compensation, or profit) at the time of the event, engaged in a legal work activity, or present at the site of the incident as a requirement of his or her job. These criteria are generally broader than those used by Federal and State agencies administering specific laws and regula-

[14] This pattern also holds for an important subset of occupations in the construction industry—construction trades. This subset excludes two risky jobs in the construction industry—construction helpers and laborers—which employ far more wage and salaried workers than self-employed individuals. Table 2 shows that construction trades composed 6 percent of all self-employed fatalities, which compares with 11 percent of total employment for the unincorporated self-employed in 1993. By contrast, those trades were 10 percent of the fatality total for wage and salaried workers, well above their 3-percent share of total employment for those workers.

[15] Risk differences in construction between the two classes of workers in part are explained by differences in staffing patterns among individual construction trades. Within the construction trades category, the self-employed are mostly employed as carpenters or painters, two trades having a relatively low risk of fatal injury; those two trades are only a third of all wage and salary workers in construction trades. Electricians, electrical power installers and repairers, and structural metal workers, by contrast three occupations with relatively high fatality risks, together are about 20 percent of total wage and salaried worker employment in all construction trades but only 5 percent of the self-employed total for all construction trades.

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tions. Fatalities that occur during a person's commute to or from work are excluded from the census counts.

Data presented in this article include deaths occurring in 1993 that resulted from traumatic occupational injuries. An injury is defined as any intentional or unintentional wound or damage to the body resulting from acute exposure to energy, such as heat or electricity or kinetic energy from a crash, or from the absence of such essentials as heat or oxygen caused by a specific event or incident or series of events within a single workday or shift. Included are open wounds, intracranial and internal injuries, heatstroke, hypothermia, asphyxiation, acute poisonings resulting from a short-term exposure (limited to the worker's shift), suicides and homicides, and work injuries listed as underlying or contributory causes of death.

Information on work-related illnesses are excluded from the BLS census because of the latency period of many occupational illnesses and the resulting difficulties associated with linking illnesses to work. Partial information on fatal occupational illnesses, primarily heart attacks at work, are compiled separately and are available upon request.

Measurement techniques and limitations. Data for the Census of Fatal Occupational Injuries are compiled from various State and Federal administrative sources—including death certificates, workers' compensation reports and claims, reports to various regulatory agencies, and medical examiner reports—as well as news reports. Multiple sources are used because studies have shown that no single source captures all job-related fatalities. Source documents are matched so that each fatality is counted only once. To ensure that a fatality occurred while the decedent was at work, information is verified from two or more independent source documents, or from a source document and a follow-up questionnaire. Approximately 30 data elements are collected, coded, and tabulated, including information about the worker, the fatal incident, and the machinery and equipment involved.

Because some State laws and regulations prohibit enumerators from contacting the next-of-kin, it was not possible to independently verify work relationship (whether a fatality is job related) for 277 fatal work injuries in 1993; however, the information on the initiating source document for these cases was sufficient to determine that the circumstances of the incident was likely to be job related. Data for these fatalities, which primarily affected the self-employed, are included in the Census of Fatal Occupational Injuries counts. An additional 49 fatalities submitted by the States were not included because the initiating source document had insufficient information to determine work relationship, which could not be verified by either an independent source document or a follow-up questionnaire.

States may identify additional fatal work injuries after data collection closeout for a reference year. In addition, other fatalities excluded from the published count because of insufficient information to determine work relationship may be subsequently verified as work related. States, therefore, have up to one year to update their initial published State counts. This procedure ensures that fatality data are disseminated as quickly as possible and that no legitimate case is excluded from the counts. As data collection methods improve, future fatal work injury counts may become more complete.

Federal/State agency coverage. The Census of Fatal Occupational Injuries includes data for all fatal work injuries, whether they are covered by the Occupational Safety and Health Administration (OSHA) or other Federal or State agencies or are outside the scope of regulatory coverage. Thus, any comparison between the BLS census counts and those released by other agencies should take into account the different coverage and definitions being used.

Several Federal and State agencies have jurisdiction over workplace safety and health. OSHA and affiliated agencies in States with approved safety programs cover the largest portion of America's workers. However, injuries and illnesses occurring in several other industries, such as coal, metal and nonmetal mining, and transportation on water, rails, or in the air, are excluded from OSHA coverage because they are covered by other Federal agencies, such as the Mine Safety and Health Administration, the U.S. Coast Guard, the Federal Railroad Administration, and the Federal Aviation Administration. Fatalities occurring in industries regulated by Federal agencies other than OSHA accounted for about 11 percent of the fatal work injuries in 1993.

Fatalities occurring among several other groups of workers generally are not covered by any Federal or State agencies. These groups include the self-employed and unpaid family workers, which together accounted for about 21 percent of the fatality total; laborers on small farms, comprising about 5 percent of that total; and State and local government employees in States without OSHA-approved safety programs, about 4 percent. (About half of the States have approved OSHA safety programs which include State and local government employees in their coverage.)

Table 1. Percent distribution of fatal work injuries of the self-employed and wage and salary workers by event or exposure, 1993

Event or exposure[1]	Self-employed	Wage and salary workers
Number	1,191	4,981
Percent	100	100
Transportation incident	34	41
Highway	11	22
Collision between vehicles, mobile equipment	5	12
Noncollision	4	6
Jack-knifed, overturned	3	4
Nonhighway (farm, industrial)	14	4
Noncollision	13	4
Overturned	9	2
Fell from and struck by vehicle, mobile equipment	2	1
Aircraft	3	5
Worker struck by vehicle	3	6
Water vehicle	3	2
Railway	1	2
Assault and violent act	29	19
Homicide	22	16
Shooting	19	13
Stabbing	1	2
Self-inflicted injury	6	3
Contact with object, equipment	20	16
Struck by object	12	8
Falling object	7	5
Caught in or compressed by equipment or object	6	4
Running equipment, machinery	3	2
Caught in or crushed in collapsing materials	2	2
Fall	8	10
From roof	2	2
From ladder, scaffold, staging	2	2
Exposure to harmful substance or environment	7	10
Contact with electric current	3	6
Exposure to caustic or noxious substance	2	2
Oxygen deficiency, including drowning, submersion	2	2
Fire and explosion	2	4

[1]Based on the 1992 BLS Occupational Injury and Illness Classification structures.

NOTE: Total for a major event category may include data for subcategories not shown separately. Percentages may not add to totals because of rounding.

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Table 2. Percent distribution of fatal work injuries of the self-employed and wage and salary workers by occupation, 1993

Occupation[1]	Self-employed	Wage and salary workers
Number	1,191	4,981
Percent	100	100
Managerial and professional	17	10
Executive, administrative, and managerial	14	5
Manager, food serving and lodging establishment	3	1
Professional specialty	3	4
Writer, artist, entertainer, athlete	1	1
Technical, sales, and administrative support	17	12
Sales occupation	16	7
Supervisor, proprietor	13	2
Technical and administrative support	2	5
Service	2	10
Farming, forestry, fishing	42	8
Farm operator and manager	29	1
Farm worker and supervisor	4	3
Timber cutting and logging	3	2
Fisher	3	1
Precision production, craft, and repair	12	19
Mechanic and repairer	4	5
Vehicle repairer	2	3
Construction trade	6	10
Nonsupervisory worker	4	8
Carpenter	1	2
Electrician	1	1
Operator, fabricator, laborer	10	37
Transportation and material moving operation	8	22
Motor vehicle operator	7	17
Truckdriver	4	14
Cabdriver and chauffeur	2	2
Material moving equipment operator	1	3
Handler, helper, laborer	1	11
Military occupation	–	2

[1]Based on the 1990 Occupational Classification System developed by the Bureau of the Census.

NOTE: Totals for major occupational categories may include data for subcategories not shown separately. Percentages may not add to totals because of rounding.

Dash indicates that the category is not applicable.

Table 3. Percent distribution of fatal work injuries of the self-employed and wage and salary workers by sex, age, race, and major industry, 1993

Characteristic	Self-employed	Wage and salary workers
Number	1,191	4,981
Percent	100	100
Sex and age		
Men	95	92
Women	5	8
Both sexes:		
Under 35 years	16	39
35 to 44 years	22	26
45 to 54 years	20	19
55 years and over	42	17
55-64 years	19	12
65 years and over	13	5
Race		
White	85	80
Black	6	12
Asian or Pacific Islander	5	3
Other	4	5
Major industry		
Agriculture (private)	36	6
Under age 55	15	4
55 years and older	21	1
Nonagricultural (private)	64	81
Forestry and fishing	4	1
Mining	1	3
Construction	11	16
Manufacturing	5	14
Transportation and public utilities	7	16
Wholesale trade	2	5
Retail trade	18	11
Finance, insurance, and real estate	2	2
Services	12	12
Government	–	13

NOTE: Percentages may not add to totals because of rounding.

Dash indicates that the category is not applicable.

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Appendix A. National data from the 1993 Census of Fatal Occupational Injuries

This appendix presents detailed breakouts of national data from the 1993 Census of Fatal Occupational Injuries (CFOI). Revised data for the 1992 census is also shown.

In 1993, highway traffic incidents accounted for 20 percent of the 6,271 fatal occupational injuries. About half of the highway deaths resulted from collisions between two or more vehicles and a fifth from overturned vehicles. Half of the workers killed in highway motor vehicle incidents were driving or riding in a truck.

Homicide was the second leading fatal event at work, accounting for 17 percent of the workers fatally injured in 1993. Robbery was the primary motive for homicide at work. Workers in retail establishments, such as grocery stores and eating and drinking places, made up about half of the homicide victims. Taxicab drivers also were at particular risk of being shot while working. Roughly 1 in 7 of the victims of workplace homicide was killed by a work or personal associate.

About four-fifths of the workplace homicide victims were men. But homicide was, by far, the most frequent manner in which women were fatally injured, accounting for 39 percent of the 481 women killed at work. In contrast, 17 percent of the 5,790 fatally injured working men were homicide victims.

Eighty-five percent of the workers fatally injured on the job in 1993 died the day they were injured; 97 percent died within 30 days.

Fatal occupational injuries by year, 1991-93

Year	Fatal injuries
1991[1]	3,822
1992	6,217[2]
1993	6,271

[1]Only 32 states participated in the 1991 CFOI program.

[2]This is the final (revised) total. The initial published total was 6,083 work injury fatalities. States are allowed a one-time revision, 1 year after the initial total is published. This allows additional cases, identified after the initial publication deadline, to be included in the revised total.

Table A-1. Fatal occupational injuries by event or exposure, 1992 and 1993

Event or exposure[1]	Fatalities		
	1992	1993	
	Number	Number	Percent
Total	6,217	6,271	100.0
Transportation incidents	2,484	2,482	39.6
Highway	1,158	1,232	19.6
Collision between vehicles, mobile equipment	578	652	10.4
Re-entrant collision	13	13	.2
Moving in same direction	78	99	1.6
Moving in opposite directions, oncoming	201	244	3.9
Moving in intersection	107	120	1.9
Moving and standing vehicle, mobile equipment-in roadway	28	30	.5
Moving and standing vehicle, mobile equipment-side of road	18	22	.4
Vehicle struck stationary object or equipment in roadway	28	29	.5
Vehicle struck stationary object or equipment on side of road	164	159	2.5
Noncollision	301	333	5.3
Jack-knifed or overturned--no collision	213	235	3.7
Ran off highway--no collision	64	57	.9
Sudden start or stop, n.e.c.	–	7	.1
Nonhighway (farm, industrial premises)	436	392	6.3
Collision between vehicles or mobile equipment	16	13	.2
Vehicle, mobile equipment struck stationary object	19	22	.4
Noncollision accident	389	342	5.5
Fall from moving vehicle, mobile equipment	26	18	.3
Fell from and struck by vehicle, mobile equipment	94	87	1.4
Overturned	208	212	3.4
Loss of control	24	–	–
Sudden start or stop, n.e.c.	4	–	–
Aircraft	353	280	4.5
Worker struck by vehicle, mobile equipment	346	361	5.8
Worker struck by vehicle, mobile equipment in roadway	109	126	2.0
Worker struck by vehicle, mobile equipment on side of road	59	54	.9
Worker struck by vehicle, mobile equipment in parking lot or non-road area	144	150	2.4
Water vehicle	109	119	1.9
Collision	–	4	.1
Fall from ship or boat, n.e.c.	40	44	.7
Fall on ship, boat	4	–	–
Sinking, capsized water vehicle	54	53	.8
Railway	66	85	1.4
Collision between railway vehicles	–	7	.1
Collision between railway vehicle and other vehicle	47	63	1.0
Fell from and struck by railway vehicle	5	–	–
Derailment	–	6	.1
Assaults and violent acts	1,281	1,309	20.9
Homicides	1,044	1,063	17.0
Shooting	852	874	13.9
Stabbing	90	95	1.5
Self-inflicted injury	205	215	3.4
Assaults by animals	29	31	.5
Contact with objects and equipment	1,004	1,039	16.6
Struck by object	557	563	9.0
Struck by falling object	361	345	5.5
Struck by flying object	77	81	1.3
Struck by swinging or slipping object	42	33	.5
Struck by rolling, sliding objects on floor or ground level	38	62	1.0
Caught in or compressed by equipment or objects	316	308	4.9
Caught in running equipment or machinery	159	150	2.4
Compressed or pinched by rolling, sliding, or shifting objects	55	56	.9
Caught in or crushed in collapsing materials	110	138	2.2
Excavation or trenching cave-in	42	38	.6
Other cave-in	5	23	.4
Landslide	5	–	–
Caught in or crushed in collapsing structure	31	27	.4
Falls	600	611	9.7
Fall to lower level	507	530	8.5
Fall down stairs or steps	31	23	.4
Fall from floor, dock, or ground level	37	38	.6
Fall from ladder	78	75	1.2
Fall from piled or stacked material	–	6	.1
Fall from roof	108	120	1.9
Fall from scaffold, staging	66	71	1.1
Fall from building girders or other structural steel	37	40	.6
Fall from nonmoving vehicle	39	32	.5
Jump to lower level	8	8	.1
Fall on same level	62	46	.7
Exposure to harmful substances or environments	605	590	9.4
Contact with electric current	334	324	5.2
Contact with electric current of machine, tool, appliance, light fixture	60	44	.7
Contact with wiring, transformers, or other electrical component	66	99	1.6

See footnotes at end of table.

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Table A-1. Fatal occupational injuries by event or exposure, 1992 and 1993 — Continued

Event or exposure[1]	Fatalities		
	1992	1993	
	Number	Number	Percent
Contact with overhead power lines	140	115	1.8
Contact with underground, buried power lines	–	4	.1
Struck by lightning	15	16	.3
Contact with temperature extremes	33	38	.6
Exposure to environmental heat	12	22	.4
Exposure to environmental cold	5	4	.1
Contact with hot objects or substances	16	11	.2
Exposure to caustic, noxious, or allergenic substances	127	116	1.8
Inhalation of substance	83	69	1.1
Inhalation in enclosed, restricted, or confined space	51	43	.7
Inhalation in open or nonconfined space	18	15	.2
Contact with skin or other exposed tissue	5	–	–
Injections, stings, venomous bites	10	10	.2
Bee, wasp, hornet sting	4	5	.1
Ingestion of substance	13	13	.2
Oxygen deficiency	111	111	1.8
Drowning, submersion	78	89	1.4
Depletion of oxygen from cave-in or collapsed materials	–	4	.1
Depletion of oxygen in other enclosed, restricted, or confined space	13	–	–
Fires and explosions	167	201	3.2
Fires--unintended or uncontrolled	59	88	1.4
Fire in residence, building, or other structure	31	49	.8
Forest, brush, or other outdoor fire	5	4	.1
Ignition of clothing from controlled heat source	4	–	–
Explosion	105	111	1.8
Explosion of pressure vessel or piping	36	39	.6
Other events or exposures[2]	76	39	.6

[1] Based on the 1992 BLS Occupational Injury and Illness Classification Structures.

[2] Includes the category "Bodily reaction and exertion."

NOTE: Totals for major categories may include subcategories not shown separately. Percentages may not add to totals because of rounding. The total number of fatalities reported for 1992 has been revised and includes additional cases identified since its initial release.

Dashes indicate no data reported or data that do not meet publication criteria.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1992-1993.

Table A-2. Fatal occupational injuries by occupation, 1992 and 1993

Occupation[1]	Fatalities		
	1992	1993	
	Number	Number	Percent
Total	6,217	6,271	100.0
Managerial and professional specialty	708	681	10.9
Executive, administrative, and managerial	443	427	6.8
Administrators and officials, public administration	22	16	.3
Financial managers	8	5	.1
Managers, marketing, advertising, and public relations	18	11	.2
Administrators, education and related fields	11	6	.1
Managers, food serving and lodging establishments	79	84	1.3
Managers, properties and real estate	22	19	.3
Funeral directors	11	–	–
Managers, service organizations, n.e.c.	11	15	.2
Managers and administrators, n.e.c.	206	213	3.4
Management related occupations	45	45	.7
Accountants and auditors	6	12	.2
Other financial officers	6	–	–
Purchasing agents and buyers, farm products	–	5	.1
Construction inspectors	6	5	.1
Inspectors and compliance officers, except construction	9	6	.1
Professional specialty	265	254	4.1
Engineers, architects, and surveyors	49	54	.9
Engineers	46	46	.7
Aerospace	–	7	.1
Chemical	4	–	–
Civil engineers	6	14	.2
Electrical and electronic	11	8	.1
Mechanical	6	–	–
Surveyors and mapping scientists	–	6	.1
Mathematical and computer scientists	7	6	.1
Computer systems analysts and scientists	6	–	–
Natural scientists	25	14	.2
Chemists, except biochemists	–	4	.1
Geologists and geodesists	7	–	–
Biological and life scientists	8	–	–
Health diagnosing occupations	21	16	.3
Physicians	13	9	.1
Dentists	4	4	.1
Health assessment and treating occupations	22	32	.5
Registered nurses	14	21	.3
Teachers, postsecondary	–	7	.1
Teachers, except postsecondary	33	29	.5
Teachers, elementary school	6	6	.1
Teachers, secondary school	–	4	.1
Social, recreation, and religious workers	32	32	.5
Social workers	10	11	.2
Clergy	15	12	.2
Lawyers and judges	14	11	.2
Lawyers	13	11	.2
Writers, artists, entertainers, and athletes	51	48	.8
Actors and directors	5	5	.1
Photographers	9	6	.1
Artists, performers, and related workers	7	7	.1
Public relations specialists	–	4	.1
Athletes	10	15	.2
Technical, sales, and administrative support	841	842	13.4
Technicians and related support occupations	202	167	2.7
Health technologists and technicians	19	17	.3
Clinical laboratory technologists and technicians	5	5	.1
Engineering and related technologists and technicians	35	18	.3
Electrical and electronic technicians	19	8	.1
Technicians, except health, engineering, and science	140	125	2.0
Airplane pilots and navigators	120	104	1.7
Sales occupations	517	556	8.9
Supervisors and proprietors, sales occupations	241	247	3.9
Sales representatives, finance and business services	46	45	.7
Real estate sales occupations	9	11	.2
Securities and financial services sales occupations	5	6	.1
Sales representatives, commodities except retail	36	34	.5
Sales representatives, mining, manufacturing, and wholesale	34	32	.5
Sales workers, retail and personal services	191	225	3.6
Sales workers, motor vehicles and boats	12	17	.3
Sales workers, furniture and home furnishings	–	5	.1
Sales workers, parts	–	9	.1
Sales counter clerks	16	24	.4
Cashiers	82	101	1.6
Street and door-to-door sales workers	12	6	.1
News vendors	9	14	.2
Administrative support occupations, including clerical	122	119	1.9
Supervisors, administrative support occupations	4	7	.1
Secretaries, stenographers, and typists	14	18	.3

See footnotes at end of table.

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Table A-2. Fatal occupational injuries by occupation, 1992 and 1993 — Continued

Occupation[1]	Fatalities		
	1992	1993	
	Number	Number	Percent
Secretaries	13	18	.3
Information clerks	10	–	–
Financial records processing occupations	6	8	.1
Bookkeepers, accounting, and auditing clerks	5	6	.1
Mail and message distributing occupations	24	29	.5
Mail carriers, postal service	9	12	.2
Mail clerks, except postal service	–	4	.1
Messengers	12	12	.2
Material recording, scheduling, and distributing clerks	25	20	.3
Dispatchers	4	5	.1
Traffic, shipping, and receiving clerks	8	8	.1
Stock and inventory clerks	6	4	.1
Adjusters and investigators	8	9	.1
Miscellaneous administrative support	23	21	.3
General office clerks	15	13	.2
Service occupations	540	539	8.6
Private household occupations	7	7	.1
Private household cleaners and servants	–	4	.1
Protective service occupations	279	288	4.6
Firefighting and fire prevention occupations, including supervisors	34	39	.6
Fire inspection and fire prevention occupations	6	–	–
Firefighting occupations	27	36	.6
Police and detectives, including supervisors	140	149	2.4
Police and detectives, public services	95	101	1.6
Sheriffs, bailiffs, and other law enforcement officers	34	28	.4
Correctional institution officers	5	12	.2
Guards	105	100	1.6
Crossing guards	–	8	.1
Guards and police, except public service	93	86	1.4
Service occupations, except protective and household	254	243	3.9
Food preparation and service occupations	85	77	1.2
Supervisors, food preparation and service occupations	16	4	.1
Bartenders	14	8	.1
Waiters and waitresses	11	13	.2
Cooks	19	17	.3
Food counter, fountain and related occupations	11	9	.1
Kitchen, workers, food preparation	–	8	.1
Miscellaneous food preparation occupations	8	15	.2
Health service occupations	21	16	.3
Nursing aides, orderlies, and attendants	16	11	.2
Cleaning and building service occupations, except household	106	106	1.7
Supervisors, cleaning and building services workers	8	10	.2
Maids and housemen	10	7	.1
Janitors and cleaners	84	83	1.3
Pest control occupations	–	6	.1
Personal service occupations	42	44	.7
Hairdressers and cosmetologists	7	7	.1
Attendants, amusement and recreation facilities	9	7	.1
Guides	9	11	.2
Farming, forestry, and fishing	936	961	15.3
Farming operators and managers	344	409	6.5
Farmers, except horticultural	259	328	5.2
Horticultural specialty farmers	6	6	.1
Managers, farms, except horticultural	69	67	1.1
Managers, horticultural specialty farms	10	8	.1
Other agricultural and related occupations	344	319	5.1
Farm occupations, except managerial	263	214	3.4
Supervisors, farm workers	55	25	.4
Farm workers	205	184	2.9
Related agricultural occupations	81	105	1.7
Supervisors, related agricultural occupations	10	11	.2
Groundskeepers and gardeners, except farm	68	88	1.4
Animal caretakers, except farm	–	6	.1
Forestry and logging occupations	155	142	2.3
Supervisors, forestry, and logging workers	13	11	.2
Forestry workers, except logging	9	7	.1
Timber cutting and logging occupations	133	124	2.0
Fishers, hunters, and trappers	93	91	1.5
Fishers	72	79	1.3
Precision production, craft, and repair	1,080	1,095	17.5
Mechanics and repairers	279	317	5.1
Vehicle and mobile equipment mechanics, repairers, and supervisors	166	200	3.2
Automobile mechanics and aprentices	39	60	1.0
Bus, truck, and stationary engine mechanics	26	26	.4
Aircraft engine mechanics	5	7	.1
Automobile body and related repairers	12	5	.1
Heavy equipment mechanics	20	32	.5

See footnotes at end of table.

Table A-2. Fatal occupational injuries by occupation, 1992 and 1993 — Continued

Occupation[1]	Fatalities		
	1992	1993	
	Number	Number	Percent
Farm equipment mechanics	4	4	.1
Industrial machinery repairers	23	24	.4
Machinery maintenance occupations	12	11	.2
Electrical and electronic equipment repairers	43	38	.6
Electronic repairers, communications and industrial equipment	13	16	.3
Telephone line installers and repairers	8	4	.1
Telephone installers and repairers	6	7	.1
Miscellaneous electrical and electronic equipment repairers	9	9	.1
Heating, air conditioning, and refrigeration mechanics	19	16	.3
Miscellaneous mechanics and repairers	51	63	1.0
Locksmiths and safe repairers	–	4	.1
Elevator installers and repairers	6	5	.1
Millwrights	13	4	.1
Construction trades	590	565	9.0
Supervisors, construction occupations	91	92	1.5
Supervisors, carpenters and related workers	12	6	.1
Supervisors, electricians and power transmission installers	4	7	.1
Supervisors, n.e.c.	64	75	1.2
Construction trades, except supervisors	499	473	7.5
Brickmasons, stonemasons, and apprentices	11	20	.3
Carpenters and apprentices	92	90	1.4
Drywall installers	–	10	.2
Electricians and apprentices	89	71	1.1
Electrical power installers and repairers	37	42	.7
Painters, construction and maintenance	48	54	.9
Plumbers, pipefitters, steamfitters, and apprentices	33	40	.6
Insulation workers	4	–	–
Paving, surfacing, and tamping equipment operators	8	5	.1
Roofers	50	47	.7
Structural metal workers	47	34	.5
Drillers, earth	–	5	.1
Extractive occupations	86	97	1.5
Supervisors, extractive occupations	13	12	.2
Drillers, oil wells	10	27	.4
Mining machine operators	38	25	.4
Precision production occupations	125	116	1.8
Precision metal working occupations	39	32	.5
Tool and die makers	–	4	.1
Machinists	15	12	.2
Boilermakers	7	6	.1
Sheet metal workers	7	7	.1
Precision food production occupations	13	10	.2
Butchers and meat cutters	9	5	.1
Bakers	4	4	.1
Precision inspectors, testers, and related workers	–	4	.1
Inspectors, testers, and graders	–	4	.1
Plant and system operators	26	24	.4
Water and sewage treatment plant operators	5	4	.1
Stationary engineers	7	11	.2
Operators, fabricators, and laborers	1,916	1,959	31.2
Machine operators, assemblers, and inspectors	227	205	3.3
Metal working and plastic working machine operators	10	8	.1
Metal and plastic processing machine operators	9	11	.2
Molding and casting machine operators	4	9	.1
Woodworking machine operators	17	14	.2
Sawing machine operators	15	10	.2
Printing machine operators	9	4	.1
Textile, apparel, and furnishings machine operators	11	7	.1
Textile sewing machine operators	–	5	.1
Machine operators, assorted materials	84	80	1.3
Furnace, kiln, and oven operators except food	10	8	.1
Fabricators, assemblers, and hand working occupations	76	74	1.2
Welders and cutters	65	58	.9
Assemblers	9	10	.2
Hand painting, coating, and decorating occupations	–	4	.1
Transportation and material moving occupations	1,118	1,182	18.8
Motor vehicle operators	873	917	14.6
Truck drivers	699	731	11.7
Driver-sales workers	46	41	.7
Bus drivers	14	15	.2
Taxicab drivers and chauffeurs	106	113	1.8
Parking lot attendants	–	5	.1
Transportation occupations, except motor vehicles	82	85	1.4
Rail transportation occupations	27	42	.7
Railroad conductors and yardmasters	6	12	.2
Locomotive operating occupations	4	12	.2
Railroad brake, signal, and switch operators	13	17	.3
Water transportation occupations	55	43	.7
Ship captains and mates, except fishing boats	14	11	.2
Sailors and deckhands	40	30	.5

See footnotes at end of table.

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Table A-2. Fatal occupational injuries by occupation, 1992 and 1993 — Continued

Occupation[1]	Fatalities		
	1992	1993	
	Number	Number	Percent
Material moving equipment operators	163	180	2.9
Operating engineers	37	39	.6
Hoist and winch operators	10	9	.1
Crane and tower operators	13	13	.2
Excavating and loading machine operators	13	21	.3
Grader, dozer, and scraper operators	22	27	.4
Industrial truck and tractor equipment operators	41	44	.7
Handlers, equipment cleaners, helpers, and laborers	571	572	9.1
Helpers, mechanics and repairers	6	5	.1
Helpers, construction and extractive occupations	13	14	.2
Helpers, construction trades	11	10	.2
Helpers, surveyor	–	4	.1
Construction laborers	228	218	3.5
Production helpers	6	4	.1
Freight, stock, and material handlers	84	81	1.3
Garbage collectors	20	18	.3
Stevedores	5	10	.2
Stock handlers and baggers	29	21	.3
Machine feeders and offbearers	7	8	.1
Garage and service station related occupations	31	34	.5
Vehicle washers and equipment cleaners	9	7	.1
Hand packers and packagers	8	4	.1
Laborers, except construction	176	202	3.2
Military occupations	170	121	1.9

[1] Based on the 1990 Occupational Classification System developed by the Bureau of the Census.

NOTE: Totals for major categories may include subcategories not shown separately. Percentages may not add to totals because of rounding. In 1992, there were 29 fatalities for which there was insufficient information to determine and occupation classification. In 1993, there were 73 fatalities for which there was insufficient information to determine and occupation classification. The total number of fatalities reported for 1992 has been revised and includes additional cases identified since its initial release.

Dashes indicate no data reported or data that do not meet publication criteria.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1992-1993.

Table A-3. Fatal occupational injuries by industry, 1992 and 1993

Industry[1]	Fatalities		
	1992	1993	
	Number	Number	Percent
Total	6,217	6,271	100.0
Private industry	5,497	5,590	89.1
Agriculture, forestry and fishing	808	855	13.6
Agricultural production - crops	405	398	6.3
Cash grains	20	44	.7
Corn	–	5	.1
Field crops, except cash grains	15	21	.3
Cotton	5	–	–
Sugarcane and sugar beets	–	8	.1
Field crops, except grains, nec	–	7	.1
Vegetables and melons	9	14	.2
Fruits and tree nuts	19	23	.4
Citrus fruits	–	5	.1
Deciduous tree fruits	–	12	.2
Horticultural specialties	8	8	.1
Ornamental nursery products	5	7	.1
General farms, primarily crop	224	184	2.9
Agricultural production - livestock	165	209	3.3
Livestock, except dairy and poultry	48	60	1.0
Beef cattle feedlots	–	10	.2
Beef cattle, except feedlots	21	24	.4
Hogs	6	5	.1
Sheep and goats	4	–	–
General livestock, nec	9	9	.1
Dairy farms	53	72	1.1
Poultry and eggs	6	5	.1
Animal specialties	4	8	.1
Horses and other equines	–	4	.1
General farms, primarily animal	42	51	.8
Agricultural services	137	153	2.4
Soil preparation services	–	4	.1
Crop services	30	31	.5
Crop planting and protecting	9	17	.3
Crop harvesting	4	–	–
Crop preparation services for market	4	4	.1
Cotton ginning	5	–	–
Animal services, except veterinary	5	7	.1
Animal specialty services	–	6	.1
Farm labor and management services	9	11	.2
Farm management services	–	4	.1
Landscape and horticultural services	86	92	1.5
Landscape counseling and planning	9	5	.1
Lawn and garden services	18	17	.3
Ornamental shrub and tree services	35	53	.8
Forestry	18	8	.1
Timber tracts	9	–	–
Forestry services	8	–	–
Fishing, hunting, and trapping	83	87	1.4
Commercial fishing	79	84	1.3
Finfish	33	31	.5
Shellfish	33	42	.7
Miscellaneous marine products	5	–	–
Mining	181	174	2.8
Metal mining	12	17	.3
Copper ores	–	7	.1
Gold and silver ores	6	5	.1
Coal mining	60	40	.6
Bituminous coal and lignite mining	51	39	.6
Oil and gas extraction	82	94	1.5
Crude petroleum and natural gas	10	14	.2
Oil and gas field services	70	79	1.3
Nonmetallic minerals, except fuels	27	23	.4
Dimension stone	–	4	.1
Crushed and broken stone	10	6	.1
Sand and gravel	10	7	.1
Chemical and fertilizer minerals	–	4	.1
Construction	919	924	14.7
General building contractors	175	152	2.4
Residential building construction	84	62	1.0
Nonresidential building construction	73	70	1.1
Heavy construction, except building	241	255	4.1
Highway and street construction	92	72	1.1
Heavy construction, except highway	138	176	2.8
Special trades contractors	503	517	8.2
Plumbing, heating and air-conditioning	53	46	.7
Painting and paper hanging	37	40	.6
Electrical work	75	67	1.1

See footnotes at end of table.

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Table A-3. Fatal occupational injuries by industry, 1992 and 1993 — Continued

Industry[1]	Fatalities		
	1992	1993	
	Number	Number	Percent
Masonry, stonework, tile setting, and plastering	32	41	.7
Carpentry and floor work	36	38	.6
Roofing, siding, and sheet metal work	80	84	1.3
Concrete work	21	18	.3
Water well drilling	5	10	.2
Miscellaneous special trade contractors	161	158	2.5
Structural steel erection	42	41	.7
Excavation work	35	33	.5
Special trade contractors, n.e.c.	45	56	.9
Manufacturing	765	762	12.2
Food and kindred products	92	82	1.3
Meat products	28	19	.3
Dairy products	5	6	.1
Preserved fruits and vegetables	11	9	.1
Grain mill products	12	11	.2
Bakery products	–	8	.1
Sugar and confectionery products	6	8	.1
Fats and oils	–	5	.1
Beverages	12	8	.1
Miscellaneous food and kindred products	14	8	.1
Textile mill products	8	19	.3
Textile finishing, except wool	–	4	.1
Apparel and other textile products	10	11	.2
Miscellaneous fabricated textile products	4	–	–
Lumber and wood products	228	204	3.3
Logging	166	147	2.3
Sawmills and planing mills	41	29	.5
Millwork, plywood and structural members	12	12	.2
Miscellaneous wood products	5	9	.1
Furniture and fixtures	17	8	.1
Household furniture	10	–	–
Paper and allied products	28	15	.2
Paper mills	10	4	.1
Paperboard mills	4	–	–
Paperboard containers and boxes	7	4	.1
Printing and publishing	32	37	.6
Newspapers	14	21	.3
Commercial printing	15	9	.1
Chemicals and allied products	34	32	.5
Industrial inorganic chemicals	6	4	.1
Plastics materials and synthetics	6	5	.1
Drugs	4	4	.1
Industrial organic chemicals	5	–	–
Agricultural chemicals	5	4	.1
Miscellaneous chemical products	6	7	.1
Petroleum and coal products	10	17	.3
Petroleum refining	7	15	.2
Rubber and miscellaneous plastics products	32	29	.5
Fabricated rubber products, nec	4	4	.1
Miscellaneous plastics products, nec	24	23	.4
Stone, clay, glass and concrete products	43	53	.8
Structural clay products	4	–	–
Concrete, gypsum, and plaster products	29	37	.6
Miscellaneous nonmetallic mineral products	–	4	.1
Primary metal industries	63	71	1.1
Blast furnace and basic steel products	26	32	.5
Iron and steel foundries	7	10	.2
Primary nonferrous metals	8	5	.1
Secondary nonferrous metals	4	5	.1
Nonferrous rolling and drawing	7	6	.1
Nonferrous foundries (castings)	4	9	.1
Fabricated metal products	39	46	.7
Metal cans and shipping containers	–	4	.1
Fabricated structural metal products	17	19	.3
Metal forgings and stampings	7	6	.1
Metal services, nec	4	7	.1
Miscellaneous fabricated metal products	5	4	.1
Industrial machinery and equipment	44	44	.7
Farm and garden machinery	4	–	–
Construction and related machinery	9	9	.1
Metalworking machinery	–	9	.1
Special industry machinery	5	4	.1
General industrial machinery	–	4	.1
Refrigeration and service machinery	5	–	–
Industrial machinery, nec	10	8	.1
Electronic and other electronic equipment	20	18	.3
Electronics components and accessories	6	6	.1
Miscellaneous electrical equipment and supplies	4	4	.1

See footnotes at end of table.

Table A-3. Fatal occupational injuries by industry, 1992 and 1993 — Continued

Industry[1]	Fatalities		
	1992	1993	
	Number	Number	Percent
Transportation equipment	45	55	9
Motor vehicles and equipment	12	16	.3
Aircraft and parts	14	15	.2
Ship and boat building and repairing	15	18	.3
Instruments and related products	9	6	.1
Medical instruments and supplies	4	–	–
Miscellaneous manufacturing industries	9	15	2
Miscellaneous manufactures	7	11	.2
Transportation and public utilities	895	890	14.2
Railroad transportation	30	44	.7
Railroads	30	44	.7
Local and interurban passenger transportation	126	130	2.1
Local and suburban transportation	16	11	.2
Taxicabs	100	106	1.7
Bus charter service	4	4	.1
Trucking and warehousing	450	468	7.5
Trucking and courier services, except air	412	426	6.8
Local trucking, without storage	110	108	1.7
Trucking, except local	173	211	3.4
Local trucking with storage	7	4	.1
Courier services, except by air	21	14	.2
Public warehousing and storage	13	19	.3
Trucking terminal facilities	4	8	.1
Water transportation	70	51	.8
Deep sea foreign transportation of freight	11	5	.1
Water transportation of freight, nec	9	–	–
Water transportation services	44	40	.6
Transportation by air	90	79	1.3
Air transportation, scheduled	24	33	.5
Air transportation, nonscheduled	42	27	.4
Airports, flying fields, and services	19	19	.3
Transportation services	15	21	.3
Freight transportation arrangement	11	11	.2
Miscellaneous transportation services	–	6	.1
Communications	24	25	.4
Telephone communications	17	14	.2
Radio and television broadcasting	4	7	.1
Electric, gas, and sanitary services	86	72	1.1
Electric services	37	23	.4
Gas production and distribution	–	7	.1
Combination utility services	16	12	.2
Sanitary services	26	29	.5
Wholesale trade	253	250	4.0
Wholesale trade--durable goods	140	137	2.2
Motor vehicles, parts, and supplies	23	15	.2
Furniture and homefurnishings	7	4	.1
Lumber and construction materials	13	18	.3
Professional and commercial equipment	5	13	.2
Metals and minerals, except petroleum	8	9	.1
Electrical goods	9	–	–
Hardware, plumbing and heating equipment	18	10	.2
Machinery, equipment, and supplies	30	30	.5
Miscellaneous durable goods	27	34	.5
Wholesale trade--nondurable goods	113	113	1.8
Apparel, piece goods, and notions	4	–	–
Groceries and related products	36	42	.7
Farm-product raw materials	10	17	.3
Chemicals and allied products	6	5	.1
Petroleum and petroleum products	21	13	.2
Beer, wine, and distilled beverages	6	11	.2
Miscellaneous nondurable goods	21	21	.3
Retail trade	734	784	12.5
Building materials and garden supplies	30	32	.5
Lumber and other building materials	13	20	.3
Hardware stores	9	–	–
Mobile home dealers	5	5	.1
General merchandise stores	26	26	.4
Department stores	11	14	.2
Variety stores	6	5	.1
Miscellaneous general merchandise stores	9	5	.1
Food stores	212	223	3.6
Grocery stores	187	199	3.2
Meat and fish markets	4	–	–
Retail bakeries	11	11	.2
Automotive dealers and service stations	115	138	2.2
New and used car dealers	23	30	.5
Used car dealers	7	7	.1
Auto and home supply stores	20	22	.4

See footnotes at end of table.

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Table A-3. Fatal occupational injuries by industry, 1992 and 1993 — Continued

Industry[1]	Fatalities		
	1992	1993	
	Number	Number	Percent
Gasoline service stations	54	68	1.1
Boat dealers	4	–	–
Motorcycle dealers	4	–	–
Apparel and accessory stores	22	23	.4
Women's clothing stores	4	–	–
Family clothing stores	5	7	.1
Shoe stores	4	5	.1
Miscellaneous apparel and accessory stores	5	–	–
Furniture and homefurnishings stores	13	25	.4
Furniture and homefurnishings stores	6	10	.2
Household appliance stores	–	4	.1
Radio, television, and computer stores	6	11	.2
Eating and drinking places	190	199	3.2
Eating places	114	113	1.8
Drinking places	37	39	.6
Miscellaneous retail	126	118	1.9
Drug stores and proprietary stores	4	7	.1
Liquor stores	24	23	.4
Used merchandise stores	17	15	.2
Miscellaneous shopping goods stores	32	23	.4
Nonstore retailers	18	22	.4
Fuel dealers	16	10	.2
Retail stores, nec	13	16	.3
Finance, insurance, and real estate	122	116	1.8
Depository institutions	21	10	.2
Commercial banks	13	7	.1
Functions closely related to banking	5	–	–
Security and commodity brokers	5	8	.1
Security brokers and dealers	–	6	.1
Insurance carriers	14	13	.2
Life insurance	8	4	.1
Fire, marine, and casualty insurance	–	6	.1
Insurance agents, brokers, and service	17	15	.2
Real estate	61	64	1.0
Real estate operators and lessors	29	35	.6
Real estate agents and managers	27	25	.4
Subdividers and developers	5	4	.1
Holdings and other investment offices	–	5	.1
Services	757	758	12.1
Hotels and other lodging places	52	33	.5
Hotels and motels	40	25	.4
Camps and recreational vehicle parks	9	7	.1
Personal services	47	30	.5
Laundry, cleaning, and garment services	26	12	.2
Beauty shops	7	9	.1
Miscellaneous personal services	5	5	.1
Business services	210	188	3.0
Advertising	6	13	.2
Mailing, reproduction, stenographic	8	–	–
Services to buildings	34	31	.5
Miscellaneous equipment rental and leasing	15	8	.1
Personnel supply services	36	45	.7
Computer and data processing services	14	7	.1
Miscellaneous business services	94	82	1.3
Detective and armored car services	42	44	.7
Automotive repair, services, and parking	80	116	1.8
Automotive rentals, no drivers	11	8	.1
Automotive repair shops	53	83	1.3
Automotive services, except repair	15	23	.4
Miscellaneous repair services	46	49	.8
Electrical repair shops	10	11	.2
Miscellaneous repair shops	33	35	.6
Motion pictures	16	23	.4
Motion picture production and services	10	11	.2
Video tape rental	5	10	.2
Amusement and recreation services	64	77	1.2
Producers, orchestras, entertainers	8	–	–
Commercial sports	7	6	.1
Miscellaneous amusement, recreation services	47	70	1.1
Health services	73	65	1.0
Offices and clinics of medical doctors	15	6	.1
Offices and clinics of dentists	5	6	.1
Nursing and personal care facilities	9	9	.1
Hospitals	20	26	.4
Medical and dental laboratories	7	–	–
Home health care services	11	8	.1
Health and allied services, nec	–	5	.1
Legal services	12	14	.2
Educational services	35	28	.4

See footnotes at end of table.

Table A-3. Fatal occupational injuries by industry, 1992 and 1993 — Continued

Industry[1]	Fatalities		
	1992	1993	
	Number	Number	Percent
Elementary and secondary schools	6	7	.1
Colleges and universities	12	7	.1
Schools and educational services, nec	13	10	.2
Social services	15	28	.4
Individual and family services	–	7	.1
Job training and related services	–	8	.1
Residential care	6	10	.2
Membership organizations	37	40	.6
Business associations	4	7	.1
Civic and social associations	–	6	.1
Religious organizations	25	25	.4
Engineering and management services	53	44	.7
Engineering and architectural services	24	21	.3
Accounting, auditing, and bookkeeping	5	6	.1
Research and testing services	14	10	.2
Management and public relations	10	7	.1
Private households	14	14	.2
Services, nec	–	6	.1
Government[2]	720	681	10.9
Federal government (including resident armed forces)	256	186	3.0
Transportation and public utilities	20	16	.3
U.S. Postal Service	14	13	.2
Services	8	4	.1
Public administration	222	161	2.6
Executive, legislative, and general government	–	6	.1
Justice, public order, and safety	4	7	.1
Public order and safety	4	7	.1
Police protection	–	7	.1
Environmental quality and housing	8	–	–
Administration of economic programs	12	12	.2
National security and international affairs	195	129	2.1
National security	194	129	2.1
State government	115	146	2.3
Construction	14	17	.3
Heavy construction, except building	14	17	.3
Highway and street construction	14	17	.3
Transportation and public utilities	6	7	.1
Electric, gas, and sanitary services	4	4	.1
Services	24	30	.5
Health services	6	7	.1
Hospitals	4	4	.1
Educational services	11	17	.3
Elementary and secondary schools	4	6	.1
Colleges and universities	7	10	.2
Social services	4	4	.1
Public administration	70	91	1.5
Executive, legislative, and general government	4	11	.2
Justice, public order, and safety	27	37	.6
Public order and safety	27	36	.6
Police protection	18	23	.4
Correctional institutions	6	12	.2
Administration of human resources	–	10	.2
Environmental quality and housing	11	10	.2
Administration of economic programs	25	21	.3
Local government	341	340	5.4
Construction	30	21	.3
Heavy construction, except building	30	19	.3
Highway and street construction	24	17	.3
Heavy construction, except highway	6	–	–
Transportation and public utilities	34	46	.7
Local and interurban passenger transportation	9	15	.2
Local and suburban transportation	7	15	.2
Electric, gas, and sanitary services	16	28	.4
Electric services	–	8	.1
Sanitary services	11	12	.2
Irrigation systems	–	4	.1
Services	53	60	1.0

See footnotes at end of table.

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Table A-3. Fatal occupational injuries by industry, 1992 and 1993 — Continued

Industry[1]	Fatalities		
	1992	1993	
	Number	Number	Percent
Amusement and recreation services	7	7	.1
Miscellaneous amusement, recreation services	7	7	.1
Health services	4	6	.1
Educational services	32	42	.7
Elementary and secondary schools	28	35	.6
Social services	6	–	–
Individual and family services	6	–	–
Public administration	216	207	3.3
Executive, legislative, and general government	61	59	.9
Executive offices	13	13	.2
Legislative bodies	7	–	–
Executive and legislative combined	31	30	.5
Justice, public order, and safety	131	128	2.0
Public order and safety	129	128	2.0
Police protection	102	86	1.4
Fire protection	23	35	.6
Administration of human resources	4	–	–
Environmental quality and housing	9	12	.2
Administration of economic programs	8	4	.1

[1] *Standard Industrial Classification Manual*, 1987 Edition.
[2] Includes fatalities to workers employed by governmental organizations regardless of industry.

NOTE: Percentages may not add to totals because of rounding. There were 77 fatalities for which there was insufficient information to determine a specific industry classification, though a distinction between private and government was made for each. The total number of fatalities reported for 1992 has been revised and includes additional cases identified since its initial release.

Dashes indicate no data reported or data that do not meet publication criteria.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1992-1993.

Table A-4. Fatal occupational injuries by selected worker characteristics and event or exposure, 1993

Characteristics	Fatalities		Event or exposure[1] (percent)						
	Number	Percent	Total	Transportation incidents	Assaults and violent acts	Contact with objects and equipment	Falls	Exposure to harmful substances or environments	Fires and explosions
Total	6,271	100.0	100	39.6	20.9	16.6	9.7	9.4	3.2
Employee status									
Wage and salary workers	4,981	79.4	100	41.1	18.9	15.5	10.2	9.9	3.6
Self-employed[2]	1,290	20.6	100	33.8	28.4	20.6	7.8	7.4	1.9
Sex and age									
Men	5,790	92.3	100	39.6	19.1	17.5	10.3	9.7	3.3
Women	481	7.7	100	39.7	42.4	5.6	3.5	5.8	2.3
Both sexes:									
Under 16 years	29	.5	100	34.5	20.7	27.6	–	–	–
16 to 17 years	39	.6	100	38.5	28.2	20.5	–	–	–
18 to 19 years	101	1.6	100	41.6	18.8	13.9	5.9	15.8	4.0
20 to 24 years	502	8.0	100	35.5	21.3	18.7	6.0	14.7	3.8
25 to 34 years	1,510	24.1	100	39.6	22.1	14.2	8.0	12.5	3.0
35 to 44 years	1,576	25.1	100	38.4	21.9	16.9	9.7	8.5	3.9
45 to 54 years	1,193	19.0	100	39.9	20.7	15.7	11.1	9.0	3.1
55 to 64 years	801	12.8	100	41.7	19.4	18.0	12.2	5.4	2.4
65 years and over	514	8.2	100	43.0	16.7	20.0	12.8	4.3	2.1
Race									
White	5,106	81.4	100	41.5	17.7	17.2	10.1	9.7	3.2
Black	664	10.6	100	32.5	28.2	17.0	8.3	9.6	3.9
Asian or Pacific Islander	190	3.0	100	16.3	65.8	4.2	7.4	4.7	–
American Indian, Aleut, Eskimo	47	.7	100	40.4	17.0	10.6	8.5	14.9	8.5
Other	263	4.2	100	36.9	32.7	13.3	8.7	5.3	2.3
Hispanic origin									
Hispanic[3]	604	9.6	100	29.1	34.1	14.6	10.3	8.8	2.8

[1] Based on the 1992 BLS Occupational Injury and Illness Classification Structures.
[2] Includes paid and unpaid family workers, and may include owners of incorporated businesses, or members of partnerships.
[3] Persons identified as Hispanic may be of any race.

NOTE: Percentages may not add to totals because of rounding.
Dashes indicate no data reported or data that do not meet publication criteria.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1993.

Table A-5. Fatal occupational injuries by location of incident and event or exposure, 1993

Location	Fatalities		Event or exposure[1] (percent)						
	Number	Percent	Total	Transportation incidents	Assaults and violent acts	Contact with objects and equipment	Falls	Exposure to harmful substances or environments	Fires and explosions
Total	6,271	100.0	100	39.6	20.9	16.6	9.7	9.4	3.2
Street or highway	1,740	27.7	100	85.3	8.4	3.0	1.0	1.7	.4
Industrial place or premise	1,373	21.9	100	15.0	8.4	32.6	20.9	15.4	6.8
Industrial place and premises, unspecified	230	3.7	100	5.2	7.4	43.0	10.9	19.6	11.7
Dockyard	39	.6	100	28.2	–	28.2	23.1	10.3	–
Loading platform, factory or store	73	1.2	100	17.8	6.8	39.7	16.4	13.7	–
Railway yard, includes railway line, tracks	85	1.4	100	76.5	7.1	–	7.1	–	–
Warehouse	75	1.2	100	14.7	26.7	24.0	21.3	12.0	–
Construction site	398	6.3	100	11.3	2.8	30.2	38.2	15.1	1.8
Industrial place or premises, nec	380	6.1	100	8.9	12.9	34.5	13.7	18.7	10.5
Other specified place[2]	1,016	16.2	100	41.6	16.7	17.5	8.3	12.2	3.0
Parking lot, garage (employer's premises)	149	2.4	100	14.8	49.7	12.1	6.7	8.7	6.7
Parking lot, garage (except employer's premises)	62	1.0	100	11.3	43.5	22.6	6.5	9.7	–
River	69	1.1	100	72.5	–	5.8	–	14.5	–
Sea	120	1.9	100	72.5	–	3.3	5.8	16.7	–
Public building[3]	964	15.4	100	1.0	76.2	3.7	8.8	6.2	3.4
Hotel, motel	17	.3	100	–	58.8	–	–	35.3	–
Market, grocery or other commodity	244	3.9	100	–	94.7	–	2.9	1.6	–
Office building	125	2.0	100	–	72.0	5.6	8.8	11.2	–
Restaurant, cafe	127	2.0	100	–	82.7	–	3.9	8.7	–
Shop, commercial, store, (except grocery)	225	3.6	100	1.8	77.8	5.8	6.2	2.2	6.2
School (State, public, private)	40	.6	100	–	27.5	10.0	32.5	15.0	10.0
Farm	641	10.2	100	46.6	5.5	32.0	5.3	8.9	1.4
Farm buildings	66	1.1	100	6.1	6.1	43.9	22.7	18.2	–
Farm land under cultivation, fields, meadows	207	3.3	100	66.2	2.9	23.2	1.9	5.3	–
Farm pond, creek, canal, irrigation ditch	26	.4	100	69.2	–	–	–	19.2	–
Private residence[4]	231	3.7	100	4.8	26.4	13.4	28.1	20.3	6.9
Apartment	50	.8	100	–	42.0	–	28.0	18.0	8.0
Farm house	10	.2	100	–	50.0	–	–	–	–
Mine, quarry	104	1.7	100	13.5	–	58.7	7.7	13.5	3.8
Gravel, sand pit	13	.2	100	–	–	53.8	–	–	–
Mine	48	.8	100	8.3	–	72.9	–	10.4	–
Place for recreation and sport	71	1.1	100	22.5	12.7	9.9	16.9	36.6	–
Recreation, sports center on employer's premises	14	.2	100	–	–	–	–	42.9	–
Recreational and sports areas	40	.6	100	27.5	–	–	17.5	37.5	–
Residential institution[5]	37	.6	100	–	45.9	21.6	–	–	10.8
Prison, jail, detention home	15	.2	100	–	53.3	26.7	–	–	–
Unspecified place	94	1.5	100	19.1	19.1	13.8	17.0	18.1	4.3

[1] Based on the 1992 BLS Occupational Injury and Illness Classification Structures.
[2] Primarily includes outdoor areas such as bodies of water, woods, noncultivated fields, and parking lots.
[3] Buildings and adjacent grounds used by the general public or a particular group, such as hotels, restaurants, stores, office buildings, courthouses, and schools.
[4] These fatalities primarily occurred to repair or maintenance workers or to police while on duty.
[5] Includes children's home, dormitory, hospital, jail, nursing home, and reform school.

NOTE: Totals for major categories may include subcategories not shown separately. Percentages may not add to totals because of rounding.
Dashes indicate no data reported or data that do not meet publication criteria.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1993.

Table A-6. Fatal occupational injuries by worker activity at the time of the incident and event, 1993

Worker activity	Fatalities		Event or exposure[1] (percent)						
	Number	Percent	Total	Transportation incidents	Assaults and violent acts	Contact with objects and equipment	Falls	Exposure to harmful substances or environments	Fires and explosions
Total	6,271	100.0	100	39.6	20.9	16.6	9.7	9.4	3.2
Vehicular and transportation operations	2,352	37.5	100	87.8	6.0	3.0	1.3	1.5	.4
Driving, operating	1,583	25.2	100	89.2	7.3	1.6	.3	1.0	.4
Automobile	466	7.4	100	79.4	19.1	.9	–	–	–
Airplane	143	2.3	100	99.3	–	–	–	–	–
Truck	702	11.2	100	94.2	2.8	1.0	–	.7	.7
Industrial or construction vehicle	87	1.4	100	80.5	–	11.5	–	5.7	–
Boat	27	.4	100	85.2	–	–	–	–	–
Train	8	.1	100	100.0	–	–	–	–	–
Bus	8	.1	100	87.5	–	–	–	–	–
Bicycle, motorcycle	17	.3	100	100.0	–	–	–	–	–
Riding in, on	403	6.4	100	90.6	2.2	1.5	2.7	2.5	–
Automobile	48	.8	100	89.6	8.3	–	–	–	–
Airplane	108	1.7	100	100.0	–	–	–	–	–
Truck	92	1.5	100	97.8	–	–	–	–	–
Industrial/construction vehicle	11	.2	100	72.7	–	–	–	–	–
Boat	80	1.3	100	88.8	–	–	–	6.2	–
Train	9	.1	100	88.9	–	–	–	–	–
Bus	4	.1	100	100.0	–	–	–	–	–
Boarding, alighting	38	.6	100	26.3	21.1	18.4	26.3	–	–
Resurfacing, blacktopping, etc.	13	.2	100	53.8	–	–	–	–	–
Directing, flagging traffic	36	.6	100	94.4	–	–	–	–	–
Walking in or near roadway, etc., n.e.c.	75	1.2	100	88.0	–	10.7	–	–	–
Vehicular and transportation operations, n.e.c.	184	2.9	100	82.6	2.2	11.4	–	2.7	–
Driving, operating farm vehicle	144	2.3	100	88.9	–	8.3	–	–	–
Riding in, on farm vehicle	11	.2	100	90.9	–	–	–	–	–
Using or operating tools, machinery	698	11.1	100	22.6	1.1	48.7	7.4	10.9	8.7
Operating heavy equipment	307	4.9	100	45.3	–	42.3	3.9	6.5	1.3
Hydraulic equipment	7	.1	100	–	–	71.4	–	–	–
Crane	12	.2	100	–	–	41.7	33.3	–	–
Farm machinery	170	2.7	100	57.6	–	37.1	–	4.1	–
Mine machinery	26	.4	100	–	–	84.6	–	–	–
Earth moving machinery	24	.4	100	62.5	–	29.2	–	–	–
Materials handling machinery	24	.4	100	45.8	–	41.7	–	–	–
Operating machinery	81	1.3	100	–	4.9	61.7	–	8.6	21.0
Using power tools	35	.6	100	11.4	–	45.7	–	34.3	–
Using nonpowered hand tools	24	.4	100	–	–	45.8	16.7	33.3	–
Operating or reading gauges, valves, switches	21	.3	100	–	–	–	–	33.3	38.1
Welding	36	.6	100	–	–	16.7	–	–	63.9
Logging, trimming, pruning	166	2.6	100	6.6	–	66.9	16.9	9.6	–
Using or operating tools, machinery, gauges, n.e.c.	17	.3	100	–	–	35.3	–	–	29.4
Constructing, repairing, cleaning	1,066	17.0	100	7.3	3.0	31.0	29.0	24.1	5.5
Construction, assembling, dismantling	364	5.8	100	6.9	1.9	29.7	37.9	22.0	1.6
Constructing, assembling	94	1.5	100	5.3	–	26.6	41.5	23.4	–
Installing	108	1.7	100	4.6	–	29.6	28.7	33.3	3.7
Dismantling, removing	70	1.1	100	–	–	47.1	28.6	15.7	–
Repair, maintenance	418	6.7	100	6.9	2.9	39.5	17.2	25.1	8.4
Repairing	213	3.4	100	8.0	–	39.0	14.6	27.2	9.9
Maintenance	71	1.1	100	–	5.6	35.2	16.9	31.0	8.5
Adjusting	12	.2	100	–	–	66.7	–	–	–
Unjamming	16	.3	100	–	–	62.5	–	–	–
Inspecting or checking	67	1.1	100	10.4	–	11.9	34.3	34.3	7.5
Cleaning, washing	86	1.4	100	9.3	9.3	31.4	20.9	22.1	7.0
Clearing, spraying	20	.3	100	25.0	–	35.0	–	25.0	–
Painting, etc.	46	.7	100	–	–	–	58.7	23.9	13.0
Constructing, repairing, cleaning, n.e.c.	12	.2	100	–	–	–	41.7	–	–
Protective service activities	174	2.8	100	6.9	68.4	4.6	2.9	6.9	10.3
Fighting a fire	19	.3	100	–	–	–	–	–	89.5
Apprehending, breaking up fight, chasing	34	.5	100	–	97.1	–	–	–	–
Rescuing or evacuating	7	.1	100	–	–	–	–	71.4	–
Materials handling operations	252	4.0	100	10.3	4.8	42.9	11.9	20.2	6.7
Carrying materials	16	.3	100	–	–	–	–	31.2	–
Holding materials	8	.1	100	–	–	–	–	75.0	–
Loading, unloading (packing, unpacking) materials	105	1.7	100	10.5	4.8	60.0	11.4	8.6	4.8
Working with chemicals (except cleaning)	14	.2	100	–	–	–	–	50.0	42.9
Retrieving objects	17	.3	100	29.4	–	–	–	29.4	–
Materials handling, n.e.c.	62	1.0	100	11.3	–	45.2	11.3	22.6	–
Physical activity[2], n.e.c.	362	5.8	100	20.4	21.3	19.3	26.2	10.8	–
All other activities	1,366	21.8	100	5.1	67.4	8.3	6.6	8.7	2.5
Tending a retail establishment	480	7.7	100	–	96.0	.8	.8	.8	–

See footnotes at end of table.

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Table A-6. Fatal occupational injuries by worker activity at the time of the incident and event, 1993 — Continued

Worker activity	Fatalities		Event or exposure[1] (percent)						
	Number	Percent	Total	Transportation incidents	Assaults and violent acts	Contact with objects and equipment	Falls	Exposure to harmful substances or environments	Fires and explosions
Office work	50	.8	100	–	92.0	–	–	–	–
Health care and social services activities	24	.4	100	–	50.0	–	–	16.7	–
Animal care and tending	33	.5	100	–	60.6	15.2	–	12.1	–
Legal service activities	5	.1	100	–	100.0	–	–	–	–
Activity, n.e.c.	760	12.1	100	8.2	48.9	13.2	9.9	13.7	3.9

[1] Based on the 1992 BLS Occupational Injury and Illness Classification Structures.
[2] Includes walking, sitting, running, and climbing ladders or stairs.

n.e.c. = not elsewhere classified.

NOTE: Totals for major categories may include subcategories not shown separately. Percentages may not add to totals because of rounding.
Dashes indicate no data reported or data that do not meet publication criteria.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1993.

Table A-7. Fatal occupational injuries by primary and secondary source of injury, 1993

Source of injury[1]	Fatalities			
	Primary source[2]		Secondary source[3]	
	Number	Percent	Number	Percent
Total	6,271	100.0	6,271	100.0
Vehicles	2,536	40.4	957	15.3
Air vehicle	284	4.5	36	.6
Aircraft--powered fixed wing	162	2.6	14	.2
Jet	34	.5	7	.1
Propeller-driven aircraft	65	1.0	–	–
Aircraft--powered rotary wing	71	1.1	11	.2
Aircraft--nonpowered	–	–	4	.1
Highway vehicle, motorized	1,697	27.1	756	12.1
Automobile	457	7.3	200	3.2
Truck	1,012	16.1	420	6.7
Delivery truck	39	.6	9	.1
Dump truck	79	1.3	29	.5
Pickup truck	172	2.7	62	1.0
Semitrailer, tractor trailer, trailer truck	443	7.1	204	3.3
Plant and industrial powered vehicles, tractors	347	5.5	61	1.0
Forklift	64	1.0	28	.4
Platform lift truck--high or low lift	4	.1	–	–
Powered industrial carrier, except forklift	7	.1	4	.1
Tractor	269	4.3	28	.4
Rail vehicle	56	.9	78	1.2
Water vehicle	122	1.9	23	.4
Barge	19	.3	6	.1
Canoe, kayak, rowboat, raft	6	.1	–	–
Motorboat	11	.2	–	–
Ships--other than sail powered	11	.2	9	.1
Tugboat, commercial fishing boat	51	.8	5	.1
Structures and surfaces	655	10.4	512	8.2
Floors, walkways, ground surfaces	556	8.9	140	2.2
Floors	163	2.6	20	.3
Ground	217	3.5	64	1.0
Sidewalks, paths, outdoor walkways	21	.3	–	–
Street, road	13	.2	18	.3
Surfaces below ground level, n.e.c.	12	.2	14	.2
Ditches, channels, trenches, excavations	8	.1	14	.2
Parking lots	12	.2	–	–
Other structural elements	37	.6	137	2.2
Fences, fence panels	–	–	6	.1
Gates	5	.1	–	–
Roof	13	.2	75	1.2
Walls	9	.1	17	.3
Structures	54	.9	226	3.6
Bridges, dams, locks	4	.1	20	.3
Mines, caves, tunnels	15	.2	13	.2
Scaffolds, staging	5	.1	53	.8
Towers, poles	19	.3	48	.8
Other structures	–	–	46	.7
Guardrails, road dividers	–	–	34	.5
Machinery	498	7.9	185	3.0
Agricultural and garden machinery	118	1.9	9	.1
Harvesting and threshing machinery	33	.5	–	–
Balers	15	.2	–	–
Combines	7	.1	–	–
Mowing machinery	32	.5	–	–
Lawn mowers--riding	5	.1	–	–
Mowers, tractor	20	.3	–	–
Plowing, planting, and fertilizing machinery	14	.2	–	–
Plowing and cultivating machinery	5	.1	–	–
Construction, logging, and mining machinery	187	3.0	39	.6
Excavating machinery	52	.8	16	.3
Backhoes	19	.3	8	.1
Bulldozers	25	.4	8	.1
Loaders	60	1.0	7	.1
Bucket loaders	8	.1	–	–
Front end loaders	34	.5	4	.1
Logging and wood processing machinery--specialized	24	.4	8	.1
Forwarder/yarder, skidder	8	.1	–	–
Skidder--cable and grapple	5	.1	–	–
Mining and drilling machinery	17	.3	–	–
Drilling machines, drilling augers	6	.1	–	–
Road grading and surfacing machinery	24	.4	–	–
Graders, levellers, planers, scrapers	9	.1	–	–
Steam rollers, road pavers	8	.1	–	–
Heating, cooling, and cleaning machinery and appliances	10	.2	15	.2
Cooling and humidifying machinery and appliances	5	.1	4	.1
Heating and cooking machinery and appliances	–	–	9	.1

See footnotes at end of table.

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Table A-7. Fatal occupational injuries by primary and secondary source of injury, 1993 — Continued

Source of injury[1]	Fatalities			
	Primary source[2]		Secondary source[3]	
	Number	Percent	Number	Percent
Material handling (cranes, conveyers, jacks)	103	1.6	95	1.5
Conveyors--gravity	–	–	7	.1
Conveyors--powered	30	.5	–	–
Cranes	31	.5	31	.5
Cranes--mobile, truck, rail mounted	8	.1	6	.1
Cranes--overhead	–	–	5	.1
Overhead hoists	–	–	4	.1
Derricks	–	–	6	.1
Elevators	33	.5	24	.4
Bucket or basket hoist--truck mounted	6	.1	13	.2
Manlifts	8	.1	5	.1
Jacks	–	–	18	.3
Metal, woodworking, and special material machinery	30	.5	13	.2
Special process machinery	26	.4	6	.1
Food and beverage processing machinery--specialized	6	.1	–	–
Textile, apparel, leather production machinery	4	.1	–	–
Miscellaneous machinery	19	.3	7	.1
Parts and materials	462	7.4	158	2.5
Building materials--solid elements	121	1.9	32	.5
Pipes, ducts, tubing	29	.5	5	.1
Structural metal materials	43	.7	10	.2
Wood, lumber	23	.4	7	.1
Other building materials--solid elements	4	.1	–	–
Fasteners, connectors, ropes, ties	44	.7	18	.3
Ropes, ties	37	.6	14	.2
Hoisting accessories	–	–	6	.1
Machine, tool, and electrical parts	233	3.7	75	1.2
Electric parts	212	3.4	68	1.1
Electrical wiring	71	1.1	4	.1
Motors	6	.1	–	–
Power lines, transformers, convertors	93	1.5	58	.9
Switchboards, switches, fuses	17	.3	–	–
Metal materials--nonstructural	11	.2	–	–
Vehicle and mobile equipment parts	41	.7	23	.4
Tires, inner tubes, wheels	22	.4	7	.1
Wheels, tire rims	11	.2	–	–
Engine parts and accessories	4	.1	–	–
Trailers	7	.1	11	.2
Persons, plants, animals, and minerals	354	5.6	1,281	20.4
Animals and animal products	40	.6	11	.2
Insects, arachnids	6	.1	–	–
Mammals, except humans	33	.5	10	.2
Cattle	19	.3	–	–
Horses	8	.1	4	.1
Food products--fresh or processed	26	.4	–	–
Metallic minerals	6	.1	–	–
Metal ores--nonradiating	5	.1	–	–
Nonmetallic minerals, except fuel	51	.8	13	.2
Boulders	–	–	5	.1
Dirt, earth	31	.5	–	–
Rocks, crushed stone	9	.1	5	.1
Sand, gravel	5	.1	–	–
Person--other than injured or ill worker	26	.4	1,037	16.5
Co-worker, former co-worker or injured worker	–	–	69	1.1
Relative of injured worker	–	–	20	.3
Plants, trees, vegetation--not processed	177	2.8	109	1.7
Cash grain crops	10	.2	–	–
Field crops	4	.1	–	–
Trees, logs	162	2.6	103	1.6
Chemicals and chemical products	156	2.5	77	1.2
Aromatics and hydrocarbon derivatives, except halogenated	6	.1	–	–
Halogens and halogen compounds	4	.1	–	–
Chemical products--general	35	.6	25	.4
Drugs, alcohol, medicines	25	.4	–	–
Explosives, blasting agents, n.e.c.	–	–	7	.1
Solvents, degreasers, n.e.c.	–	–	10	.2
Coal, natural gas, petroleum fuels and products	15	.2	32	.5
Coal and coal products	4	.1	–	–
Petroleum, crude oil	–	–	5	.1
Petroleum fuels, distillates, products, unspecified	7	.1	22	.4
Gasoline, diesel fuel, jet fuel	4	.1	14	.2
Propane	–	–	4	.1
Other chemicals	86	1.4	13	.2
Ammonia and ammonium compounds	10	.2	–	–
Oxygen and oxygen compounds, n.e.c.	48	.8	6	.1
Carbon monoxide	40	.6	5	.1

See footnotes at end of table.

Table A-7. Fatal occupational injuries by primary and secondary source of injury, 1993 — Continued

Source of injury[1]	Fatalities			
	Primary source[2]		Secondary source[3]	
	Number	Percent	Number	Percent
Sewer gas, mine gas, methane	6	.1	-	-
Sulfur and sulfur compounds	9	.1	-	-
Multiple chemicals or chemical mixtures, n.e.c.	8	.1	-	-
Tools, instruments, and equipment	137	2.2	120	1.9
Handtools--nonpowered	97	1.5	7	.1
Cutting handtools	77	1.2	-	-
Knives	69	1.1	-	-
Striking and nailing handtools	4	.1	-	-
Handtools--powered	19	.3	17	.3
Boring handtools	5	.1	-	-
Cutting handtools	7	.1	7	.1
Welding and heating handtools	-	-	8	.1
Handtools--power not determined	4	.1	-	-
Ladders	9	.1	72	1.1
Ladders--fixed	-	-	4	.1
Ladders--movable	6	.1	27	.4
Extension ladders	4	.1	7	.1
Step ladders	-	-	6	.1
Containers	78	1.2	52	.8
Containers-nonpressurized	40	.6	32	.5
Barrels, kegs, drums	5	.1	-	-
Tanks, bins, vats	21	.3	27	.4
Containers-pressurized	16	.3	10	.2
Boilers	5	.1	5	.1
Containers-variable restraint	19	.3	10	.2
Bundles, bales	13	.2	10	.2
Reels, rolls	6	.1	-	-
Other	1,394	22.2	257	4.1
Ammunition	1,024	16.3	-	-
Bullets	983	15.7	-	-
Explosive devices	7	.1	-	-
Atmospheric and environmental conditions	172	2.7	78	1.2
Fire, flame, smoke	116	1.8	23	.4
Flood	-	-	5	.1
Temperature extreme	27	.4	5	.1
Steam, vapors, liquids	104	1.7	132	2.1
Scrap, waste, debris	7	.1	-	-
Not reported	-	-	2,672	42.6

[1] Based on the 1992 BLS Occupational and Illness Classification Structures.

[2] The primary source of injury identifies the object, substance, or exposure that directly produced or inflicted the injury. For transportation incidents, the source identifies the vehicle in which the deceased was an occupant.

[3] The secondary source of injury, if any, identifies the object, substance, or person that generated the source of injury or that contributed to the event or exposure. For vehicle collisions, the deceased's vehicle is the primary source and the other object (truck, road, divider, etc.) is the secondary source. For most homicides, the "bullet" is the primary source and the "perpetrator" is the secondary source. Secondary source was coded for 3,599 cases.

NOTE: Totals for major categories may include subcategories not shown separately. Percentages may not add to totals because of rounding.

Dashes indicate no data reported or data that do not meet publication criteria.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1993.

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Table A-8. Fatal occupational injuries by occupation and event or exposure, 1993

Occupation[1]	Total fatalities (number)	Event or exposure[2] (percent)					
		Transportation incidents	Assaults and violent acts	Contact with objects and equipment	Falls	Exposure to harmful substances or environments	Fires and explosions
Total	6,271	39.6	20.9	16.6	9.7	9.4	3.2
Managerial and professional specialty	681	42.3	31.9	7.3	7.9	8.5	1.5
Executive, administrative, and managerial	427	35.1	37.5	9.6	9.4	6.8	1.4
Administrators and officials, public administration	16	75.0	–	–	–	–	–
Managers, marketing, advertising, and public relations	11	81.8	–	–	–	–	–
Administrators, education and related fields	6	–	66.7	–	–	–	–
Managers, food serving and lodging establishments	84	13.1	77.4	–	–	4.8	–
Managers, properties and real estate	19	–	57.9	–	–	–	–
Managers, service organizations, n.e.c.	15	40.0	46.7	–	–	–	–
Managers and administrators, n.e.c.	213	36.6	26.3	14.1	14.1	6.6	2.3
Management related occupations	45	60.0	13.3	11.1	–	11.1	–
Accountants and auditors	12	58.3	41.7	–	–	–	–
Inspectors and compliance officers, except construction	6	100.0	–	–	–	–	–
Professional specialty	254	54.3	22.4	3.5	5.5	11.4	1.6
Engineers, architects, and surveyors	54	70.4	7.4	–	–	13.0	–
Engineers	46	71.7	–	–	–	10.9	–
Aerospace	7	85.7	–	–	–	–	–
Civil engineers	14	85.7	–	–	–	–	–
Electrical and electronic	8	50.0	–	–	–	–	–
Surveyors and mapping scientists	6	66.7	–	–	–	–	–
Mathematical and computer scientists	6	83.3	–	–	–	–	–
Natural scientists	14	–	28.6	–	–	–	–
Health diagnosing occupations	16	37.5	56.2	–	–	–	–
Physicians	9	–	66.7	–	–	–	–
Health assessment and treating occupations	32	65.6	18.8	–	–	–	–
Registered nurses	21	71.4	–	–	–	–	–
Teachers, postsecondary	7	71.4	–	–	–	–	–
Teachers, except postsecondary	29	48.3	20.7	–	17.2	13.8	–
Teachers, elementary school	6	66.7	–	–	–	–	–
Social, recreation, and religious workers	32	50.0	15.6	–	–	18.8	–
Social workers	11	54.5	–	–	–	–	–
Clergy	12	50.0	–	–	–	–	–
Lawyers and judges	11	–	72.7	–	–	–	–
Lawyers	11	–	72.7	–	–	–	–
Writers, artists, entertainers, and athletes	48	56.2	18.8	–	–	16.7	–
Actors and directors	5	80.0	–	–	–	–	–
Photographers	6	100.0	–	–	–	–	–
Artists, performers, and related workers	7	85.7	–	–	–	–	–
Athletes	15	26.7	–	–	–	40.0	–
Technical, sales, and administrative support	842	36.7	53.1	3.2	2.6	2.9	.8
Technicians and related support occupations	167	81.4	4.2	3.6	3.6	4.8	–
Health technologists and technicians	17	64.7	–	–	–	–	–
Engineering and related technologists and technicians	18	44.4	–	–	–	27.8	–
Technicians, except health, engineering, and science	125	92.0	–	–	–	–	–
Airplane pilots and navigators	104	98.1	–	–	–	–	–
Sales occupations	556	22.5	70.0	2.3	1.8	2.0	.7
Supervisors and proprietors, sales occupations	247	12.6	81.4	2.4	–	–	–
Sales representatives, finance and business services	45	55.6	40.0	–	–	–	–
Real estate sales occupations	11	–	72.7	–	–	–	–
Sales representatives, commodities except retail	34	73.5	–	–	–	–	–
Sales representatives, mining, manufacturing, and wholesale	32	71.9	–	–	–	–	–
Sales workers, retail and personal services	225	18.2	73.8	2.7	2.2	1.8	–
Sales workers, motor vehicles and boats	17	41.2	47.1	–	–	–	–
Sales workers, parts	9	55.6	–	–	–	–	–
Sales counter clerks	24	–	91.7	–	–	–	–
Cashiers	101	–	95.0	–	–	–	–
News vendors	14	64.3	35.7	–	–	–	–
Administrative support occupations, including clerical	119	40.3	42.9	6.7	5.0	4.2	–
Supervisors, administrative support occupations	7	–	57.1	–	–	–	–
Secretaries, stenographers, and typists	18	33.3	55.6	–	–	–	–
Secretaries	18	33.3	55.6	–	–	–	–
Financial records processing occupations	8	–	75.0	–	–	–	–
Bookkeepers, accounting, and auditing clerks	6	–	83.3	–	–	–	–
Mail and message distributing occupations	29	75.9	13.8	–	–	–	–
Mail carriers, postal service	12	58.3	33.3	–	–	–	–
Messengers	12	100.0	–	–	–	–	–
Material recording, scheduling, and distributing clerks	20	40.0	25.0	20.0	–	–	–
Dispatchers	5	–	80.0	–	–	–	–
Traffic, shipping, and receiving clerks	8	–	–	50.0	–	–	–
Adjusters and investigators	9	66.7	–	–	–	–	–
Miscellaneous administrative support	21	19.0	66.7	–	–	–	–
General office clerks	13	–	69.2	–	–	–	–

See footnotes at end of table.

Table A-8. Fatal occupational injuries by occupation and event or exposure, 1993 — Continued

Occupation[1]	Total fatalities (number)	Event or exposure[2] (percent)					
		Transportation incidents	Assaults and violent acts	Contact with objects and equipment	Falls	Exposure to harmful substances or environments	Fires and explosions
Service occupations	539	27.8	45.8	5.2	8.2	7.6	5.0
Private household occupations	7	-	57.1	-	-	-	-
Protective service occupations	288	34.0	48.3	3.1	3.8	4.5	6.2
Firefighting and fire prevention occupations, including supervisors	39	35.9	-	-	-	-	46.2
Firefighting occupations	36	38.1	-	-	-	-	44.4
Police and detectives, including supervisors	149	42.3	51.0	4.0	-	-	-
Police and detectives, public services	101	35.6	59.4	-	-	-	-
Sheriffs, bailiffs, and other law enforcement officers	28	60.7	32.1	-	-	-	-
Correctional institution officers	12	50.0	33.3	-	-	-	-
Guards	100	21.0	62.0	-	6.0	9.0	-
Crossing guards	8	87.5	-	-	-	-	-
Guards and police, except public service	86	12.8	70.9	-	7.0	8.1	-
Service occupations, except protective and household	243	21.4	42.4	7.4	13.6	10.7	3.7
Food preparation and service occupations	77	9.1	74.0	5.2	-	6.5	-
Supervisors, food preparation and service occupations	4	-	100.0	-	-	-	-
Bartenders	8	-	75.0	-	-	-	-
Waiters and waitresses	13	-	69.2	-	-	-	-
Cooks	17	-	70.6	-	-	-	-
Food counter, fountain and related occupations	9	-	77.8	-	-	-	-
Kitchen, workers, food preparation	8	-	62.5	-	-	-	-
Miscellaneous food preparation occupations	15	-	73.3	-	-	-	-
Health service occupations	16	43.8	50.0	-	-	-	-
Nursing aides, orderlies, and attendants	11	54.5	45.5	-	-	-	-
Cleaning and building service occupations, except household	106	21.7	19.8	11.3	26.4	14.2	6.6
Maids and housemen	7	-	-	-	-	57.1	-
Janitors and cleaners	83	19.3	20.5	12.0	30.1	12.0	6.0
Personal service occupations	44	34.1	38.6	-	-	11.4	-
Hairdressers and cosmetologists	7	-	85.7	-	-	-	-
Guides	11	90.9	-	-	-	-	-
Farming, forestry, and fishing	961	45.6	4.7	32.9	5.4	10.1	1.1
Farming operators and managers	409	51.8	4.4	31.5	3.4	6.8	1.7
Farmers, except horticultural	328	51.5	4.0	31.4	3.7	7.3	1.8
Horticultural specialty farmers	6	83.3	-	-	-	-	-
Managers, farms, except horticultural	67	52.2	-	34.3	-	-	-
Other agricultural and related occupations	319	40.4	7.5	27.0	9.7	14.1	1.3
Farm occupations, except managerial	214	51.4	7.0	27.6	3.3	9.3	-
Supervisors, farm workers	25	44.0	-	36.0	-	-	-
Farm workers	184	53.3	6.5	25.5	3.3	9.8	-
Related agricultural occupations	105	18.1	8.6	25.7	22.9	23.8	-
Supervisors, related agricultural occupations	11	36.4	-	-	-	-	-
Groundskeepers and gardeners, except farm	88	15.9	5.7	27.3	26.1	23.9	-
Forestry and logging occupations	142	20.4	-	69.0	4.9	3.5	-
Supervisors, forestry, and logging workers	11	36.4	-	63.6	-	-	-
Timber cutting and logging occupations	124	17.7	-	72.6	3.2	4.0	-
Fishers, hunters, and trappers	91	74.7	-	-	-	20.9	-
Fishers	79	73.4	-	-	-	22.8	-
Precision production, craft, and repair	1,095	19.7	8.8	21.7	23.9	19.5	5.5
Mechanics and repairers	317	23.3	14.5	27.1	9.1	18.6	6.6
Vehicle and mobile equipment mechanics, repairers, and supervisors	200	22.5	17.0	31.5	7.5	12.5	8.5
Automobile mechanics and apprentices	60	18.3	35.0	20.0	-	11.7	13.3
Bus, truck, and stationary engine mechanics	26	38.5	-	42.3	-	-	-
Heavy equipment mechanics	32	25.0	-	43.8	-	-	-
Industrial machinery repairers	24	16.7	-	25.0	-	33.3	-
Machinery maintenance occupations	11	36.4	-	36.4	-	-	-
Electrical and electronic equipment repairers	38	28.9	10.5	10.5	13.2	36.8	-
Electronic repairers, communications and industrial equipment	16	31.2	-	-	-	43.8	-
Heating, air conditioning, and refrigeration mechanics	16	25.0	-	-	-	43.8	-
Miscellaneous mechanics and repairers	63	22.2	12.7	27.0	11.1	20.6	6.3
Construction trades	565	18.4	3.7	13.6	37.3	21.9	4.2
Supervisors, construction occupations	92	31.5	7.6	14.1	32.6	9.8	4.3
Supervisors, carpenters and related workers	6	-	-	-	83.3	-	-
Supervisors, n.e.c.	75	37.3	8.0	16.0	30.7	6.7	-
Construction trades, except supervisors	473	15.9	3.0	13.5	38.3	24.3	4.2
Brickmasons, stonemasons, and apprentices	20	20.0	-	25.0	55.0	-	-
Carpenters and apprentices	90	17.8	-	15.6	45.6	16.7	-
Drywall installers	10	-	-	-	40.0	-	-
Electricians and apprentices	71	12.7	-	-	22.5	53.5	5.6
Electrical power installers and repairers	42	11.9	-	-	19.0	57.1	-
Painters, construction and maintenance	54	-	-	-	51.9	25.9	11.1

See footnotes at end of table.

Table A-8. Fatal occupational injuries by occupation and event or exposure, 1993 — Continued

Occupation[1]	Total fatalities (number)	Event or exposure[2] (percent)					
		Transportation incidents	Assaults and violent acts	Contact with objects and equipment	Falls	Exposure to harmful substances or environments	Fires and explosions
Plumbers, pipefitters, steamfitters, and apprentices	40	27.5	–	25.0	12.5	15.0	12.5
Roofers	47	8.5	–	–	72.3	14.9	–
Structural metal workers	34	–	–	20.6	61.8	–	–
Extractive occupations	97	19.6	–	47.4	8.2	17.5	4.1
Supervisors, extractive occupations	12	33.3	–	–	–	–	–
Drillers, oil wells	27	22.2	–	37.0	–	29.6	–
Mining machine operators	25	–	–	68.0	–	–	–
Precision production occupations	116	16.4	23.3	25.0	12.1	12.1	9.5
Precision metal working occupations	32	–	–	37.5	21.9	12.5	–
Machinists	12	–	–	58.3	–	–	–
Sheet metal workers	7	–	–	–	71.4	–	–
Precision food production occupations	10	–	60.0	–	–	–	–
Plant and system operators	24	20.8	16.7	–	–	20.8	16.7
Operators, fabricators, and laborers	1,959	50.2	12.0	18.0	8.0	7.2	3.9
Machine operators, assemblers, and inspectors	205	10.7	9.3	36.6	9.3	14.1	18.5
Metal working and plastic working machine operators	8	–	–	50.0	–	–	–
Metal and plastic processing machine operators	11	–	45.5	–	–	–	–
Molding and casting machine operators	9	–	44.4	–	–	–	–
Woodworking machine operators	14	–	–	71.4	–	–	–
Sawing machine operators	10	–	–	70.0	–	–	–
Machine operators, assorted materials	80	7.5	5.0	36.2	8.8	23.8	17.5
Fabricators, assemblers, and hand working occupations	74	10.8	8.1	33.8	12.2	8.1	27.0
Welders and cutters	58	12.1	8.6	31.0	6.9	6.9	34.5
Assemblers	10	–	–	50.0	–	–	–
Transportation and material moving occupations	1,182	66.6	12.5	11.3	4.7	3.0	1.1
Motor vehicle operators	917	70.7	15.2	7.7	2.5	2.1	.9
Truck drivers	731	79.8	4.4	8.6	2.9	2.3	1.0
Driver-sales workers	41	75.6	17.1	–	–	–	–
Bus drivers	15	60.0	–	–	–	–	–
Taxicab drivers and chauffeurs	113	13.3	85.8	–	–	–	–
Transportation occupations, except motor vehicles	85	70.6	–	–	14.1	5.9	–
Rail transportation occupations	42	78.6	–	–	11.9	–	–
Railroad conductors and yardmasters	12	91.7	–	–	–	–	–
Locomotive operating occupations	12	75.0	–	–	–	–	–
Railroad brake, signal, and switch operators	17	70.6	–	–	–	–	–
Water transportation occupations	43	62.8	–	–	16.3	–	–
Ship captains and mates, except fishing boats	11	90.9	–	–	–	–	–
Sailors and deckhands	30	56.7	–	–	20.0	–	–
Material moving equipment operators	180	43.9	3.9	32.8	11.1	6.7	–
Operating engineers	39	43.6	–	30.8	–	10.3	–
Hoist and winch operators	9	–	–	55.6	–	–	–
Crane and tower operators	13	–	–	30.8	53.8	–	–
Excavating and loading machine operators	21	52.4	–	28.6	–	–	–
Grader, dozer, and scraper operators	27	77.8	–	18.5	–	–	–
Industrial truck and tractor equipment operators	44	31.8	–	40.9	11.4	11.4	–
Handlers, equipment cleaners, helpers, and laborers	572	30.4	11.9	25.2	14.5	13.5	4.4
Helpers, construction and extractive occupations	14	–	–	–	–	42.9	–
Helpers, construction trades	10	–	–	–	–	50.0	–
Construction laborers	218	28.9	2.8	29.4	22.5	13.8	2.3
Freight, stock, and material handlers	81	40.7	24.7	19.8	8.6	–	–
Garbage collectors	18	77.8	–	–	–	–	–
Stevedores	10	60.0	–	–	–	–	–
Stock handlers and baggers	21	–	85.7	–	–	–	–
Machine feeders and offbearers	8	50.0	–	–	–	–	–
Garage and service station related occupations	34	20.6	64.7	11.8	–	–	–
Vehicle washers and equipment cleaners	7	–	–	–	–	57.1	–
Laborers, except construction	202	31.7	7.9	27.7	11.9	14.4	6.4

[1] Based on the 1990 Occupational Classification System developed by the Bureau of the Census.

[2] Based on the 1992 BLS Occupational Injury and Illness Classification Structures. Includes other events and exposures, such as bodily reaction, in addition to those shown separately.

NOTE: Totals for major categories may include subcategories not shown separately. Percentages may not add to totals because of rounding.

Dashes indicate no data reported or data that do not meet publication criteria.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1993.

Table A-9. Fatal occupational injuries resulting from transportation incidents and homicides by occupation, 1993

Occupation[1]	Total fatalities (number)	Transportation incidents (percent)[2]					Homicides (percent)[2]		
		Total	Highway incidents	Non-highway incidents	Worker struck by vehicle	All other transportation incidents	Total	Homicides by shooting	All other homicides
Total	6,271	39.6	19.6	6.3	5.8	7.9	17.0	13.9	3.0
Managerial and professional specialty	681	42.3	23.9	2.3	3.1	12.9	23.3	19.5	3.8
Executive, administrative, and managerial	427	35.1	20.8	2.3	2.3	9.6	28.6	24.1	4.4
Administrators and officials, public administration	16	75.0	50.0	–	–	18.8	–	–	–
Managers, marketing, advertising, and public relations	11	81.8	45.5	–	–	27.3	–	–	–
Managers, food serving and lodging establishments	84	13.1	6.0	3.6	–	–	70.2	58.3	11.9
Managers, properties and real estate	19	–	–	–	–	–	47.4	31.6	15.8
Managers, service organizations, n.e.c.	15	40.0	33.3	–	–	–	40.0	33.3	–
Managers and administrators, n.e.c.	213	36.6	19.7	2.8	2.3	11.7	16.4	14.1	2.3
Management related occupations	45	60.0	44.4	–	6.7	8.9	11.1	11.1	–
Accountants and auditors	12	58.3	50.0	–	–	–	33.3	33.3	–
Purchasing agents and buyers, farm products	5	60.0	60.0	–	–	–	–	–	–
Construction inspectors	5	60.0	–	–	–	–	–	–	–
Inspectors and compliance officers, except construction	6	100.0	83.3	–	–	–	–	–	–
Professional specialty	254	54.3	29.1	2.4	4.3	18.5	14.6	11.8	2.8
Engineers, architects, and surveyors	54	70.4	33.3	–	11.1	24.1	–	–	–
Engineers	46	71.7	34.8	–	6.5	28.3	–	–	–
Aerospace	7	85.7	–	–	–	85.7	–	–	–
Civil engineers	14	85.7	57.1	–	–	–	–	–	–
Electrical and electronic	8	50.0	37.5	–	–	–	–	–	–
Surveyors and mapping scientists	6	66.7	–	–	50.0	–	–	–	–
Mathematical and computer scientists	6	83.3	66.7	–	–	–	–	–	–
Natural scientists	14	21.4	21.4	–	–	–	–	–	–
Health diagnosing occupations	16	37.5	25.0	–	–	–	31.2	18.8	–
Physicians	9	–	–	–	–	–	55.6	33.3	–
Health assessment and treating occupations	32	65.6	40.6	–	–	21.9	18.8	18.8	–
Registered nurses	21	71.4	42.9	–	–	23.8	–	–	–
Teachers, postsecondary	7	71.4	–	–	–	42.9	–	–	–
Teachers, except postsecondary	29	48.3	17.2	–	–	20.7	13.8	13.8	–
Teachers, elementary school	6	66.7	–	–	–	–	–	–	–
Social, recreation, and religious workers	32	50.0	46.9	–	–	–	12.5	–	–
Social workers	11	54.5	54.5	–	–	–	–	–	–
Clergy	12	50.0	41.7	–	–	–	–	–	–
Lawyers and judges	11	–	–	–	–	–	54.5	54.5	–
Lawyers	11	–	–	–	–	–	54.5	54.5	–
Writers, artists, entertainers, and athletes	48	56.2	22.9	6.2	–	27.1	8.3	6.2	–
Actors and directors	5	80.0	–	–	–	60.0	–	–	–
Photographers	6	100.0	–	–	–	66.7	–	–	–
Artists, performers, and related workers	7	85.7	–	–	–	57.1	–	–	–
Public relations specialists	4	75.0	75.0	–	–	–	–	–	–
Athletes	15	26.7	–	–	–	–	–	–	–
Technical, sales, and administrative support	842	36.7	18.5	.8	2.6	14.7	47.4	38.7	8.7
Technicians and related support occupations	167	81.4	13.8	–	3.0	63.5	2.4	–	–
Health technologists and technicians	17	64.7	52.9	–	–	–	–	–	–
Clinical laboratory technologists and technicians	5	60.0	60.0	–	–	–	–	–	–
Engineering and related technologists and technicians	18	44.4	–	–	22.2	–	–	–	–
Technicians, except health, engineering, and science	125	92.0	8.0	–	–	83.2	–	–	–
Airplane pilots and navigators	104	98.1	–	–	–	98.1	–	–	–
Sales occupations	556	22.5	18.0	.7	1.6	2.2	63.5	51.8	11.7
Supervisors and proprietors, sales occupations	247	12.6	9.7	–	–	1.2	72.1	62.3	9.7
Sales representatives, finance and business services	45	55.6	46.7	–	–	–	31.1	20.0	11.1
Real estate sales occupations	11	27.3	–	–	–	–	54.5	27.3	27.3
Securities and financial services sales occupations	6	50.0	50.0	–	–	–	–	–	–
Sales representatives, commodities except retail	34	73.5	67.6	–	–	–	–	–	–
Sales representatives, mining, manufacturing, and wholesale	32	71.9	65.6	–	–	–	–	–	–
Sales workers, retail and personal services	225	18.2	13.3	–	2.2	2.2	70.7	55.1	15.6
Sales workers, motor vehicles and boats	17	41.2	29.4	–	–	–	41.2	41.2	–
Sales workers, furniture and home furnishings	5	60.0	60.0	–	–	–	–	–	–
Sales workers, parts	9	55.6	55.6	–	–	–	–	–	–
Sales counter clerks	24	–	–	–	–	–	91.7	62.5	29.2
Cashiers	101	–	–	–	–	–	93.1	72.3	20.8
Street and door-to-door sales workers	6	–	–	–	–	–	50.0	–	–
News vendors	14	64.3	57.1	–	–	–	35.7	28.6	–
Administrative support occupations, including clerical	119	40.3	27.7	–	6.7	5.0	35.3	30.3	5.0
Supervisors, administrative support occupations	7	–	–	–	–	–	57.1	57.1	–
Secretaries, stenographers, and typists	18	33.3	16.7	–	–	–	55.6	55.6	–
Secretaries	18	33.3	16.7	–	–	–	55.6	55.6	–
Financial records processing occupations	8	–	–	–	–	–	75.0	37.5	37.5
Bookkeepers, accounting, and auditing clerks	6	–	–	–	–	–	83.3	–	50.0
Mail and message distributing occupations	29	75.9	55.2	–	–	13.8	–	–	–
Mail carriers, postal service	12	58.3	50.0	–	–	–	–	–	–
Mail clerks, except postal service	4	75.0	–	–	–	–	–	–	–
Messengers	12	100.0	66.7	–	–	25.0	–	–	–
Material recording, scheduling, and distributing clerks	20	40.0	20.0	–	15.0	–	25.0	25.0	–

See footnotes at end of table.

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Table A-9. Fatal occupational injuries resulting from transportation incidents and homicides by occupation, 1993 — Continued

Occupation[1]	Total fatalities (number)	Transportation incidents (percent)[2]					Homicides (percent)[2]		
		Total	Highway incidents	Non-highway incidents	Worker struck by vehicle	All other transportation incidents	Total	Homicides by shooting	All other homicides
Dispatchers	5	–	–	–	–	–	80.0	80.0	–
Traffic, shipping, and receiving clerks	8	37.5	–	–	–	–	–	–	–
Adjusters and investigators	9	66.7	55.6	–	–	–	–	–	–
Miscellaneous administrative support	21	19.0	14.3	–	–	–	47.6	38.1	–
General office clerks	13	–	–	–	–	–	46.2	30.8	–
Service occupations	539	27.8	18.0	1.1	5.2	3.5	39.1	32.5	6.7
Private household occupations	7	–	–	–	–	–	57.1	–	–
Protective service occupations	288	34.0	22.2	–	8.0	3.1	42.4	37.8	4.5
Firefighting and fire prevention occupations, including supervisors	39	35.9	28.2	–	–	–	–	–	–
Firefighting occupations	36	36.1	27.8	–	–	–	–	–	–
Police and detectives, including supervisors	149	42.3	31.5	–	5.4	4.7	45.6	41.6	4.0
Police and detectives, public services	101	35.6	25.7	–	5.9	4.0	56.4	52.5	4.0
Sheriffs, bailiffs, and other law enforcement officers	28	60.7	50.0	–	–	–	32.1	32.1	–
Correctional institution officers	12	50.0	41.7	–	–	–	–	–	–
Guards	100	21.0	6.0	–	13.0	–	54.0	47.0	7.0
Crossing guards	8	87.5	–	–	87.5	–	–	–	–
Guards and police, except public service	86	12.8	5.8	–	7.0	–	61.6	53.5	8.1
Service occupations, except protective and household	243	21.4	13.6	1.6	2.1	4.1	34.6	25.9	8.6
Food preparation and service occupations	77	9.1	5.2	–	–	–	70.1	53.2	16.9
Supervisors, food preparation and service occupations	4	–	–	–	–	–	100.0	100.0	–
Bartenders	8	–	–	–	–	–	50.0	–	–
Waiters and waitresses	13	–	–	–	–	–	69.2	30.8	38.5
Cooks	17	–	–	–	–	–	70.6	64.7	–
Food counter, fountain and related occupations	9	–	–	–	–	–	77.8	66.7	–
Kitchen, workers, food preparation	8	–	–	–	–	–	50.0	37.5	–
Miscellaneous food preparation occupations	15	–	–	–	–	–	73.3	66.7	–
Health service occupations	16	43.8	37.5	–	–	–	43.8	37.5	–
Nursing aides, orderlies, and attendants	11	54.5	45.5	–	–	–	36.4	27.3	–
Cleaning and building service occupations, except household	106	21.7	17.0	2.8	–	–	9.4	6.6	2.8
Supervisors, cleaning and building services workers	10	30.0	–	–	–	–	–	–	–
Janitors and cleaners	83	19.3	14.5	3.6	–	–	10.8	8.4	–
Pest control occupations	6	50.0	50.0	–	–	–	–	–	–
Personal service occupations	44	34.1	11.4	–	–	22.7	29.5	20.5	9.1
Hairdressers and cosmetologists	7	–	–	–	–	–	85.7	57.1	–
Guides	11	90.9	–	–	–	81.8	–	–	–
Farming, forestry, and fishing	961	45.6	8.4	23.7	4.7	8.7	1.2	1.0	–
Farming operators and managers	409	51.8	9.3	36.2	4.6	1.7	1.0	.7	–
Farmers, except horticultural	328	51.5	9.8	35.7	4.6	1.5	.9	.9	–
Horticultural specialty farmers	6	83.3	–	50.0	–	–	–	–	–
Managers, farms, except horticultural	67	52.2	7.5	40.3	–	–	–	–	–
Managers, horticultural specialty farms	8	37.5	–	–	–	–	–	–	–
Other agricultural and related occupations	319	40.4	11.6	21.0	5.3	2.5	1.9	1.6	–
Farm occupations, except managerial	214	51.4	15.9	26.2	6.1	3.3	–	–	–
Supervisors, farm workers	25	44.0	16.0	24.0	–	–	–	–	–
Farm workers	184	53.3	16.3	27.2	6.5	3.3	–	–	–
Related agricultural occupations	105	18.1	2.9	10.5	3.8	–	4.8	3.8	–
Supervisors, related agricultural occupations	11	36.4	–	–	–	–	–	–	–
Groundskeepers and gardeners, except farm	88	15.9	–	11.4	–	–	4.5	4.5	–
Forestry and logging occupations	142	20.4	4.2	8.5	6.3	–	–	–	–
Supervisors, forestry, and logging workers	11	36.4	–	–	–	–	–	–	–
Forestry workers, except logging	7	42.9	–	–	–	–	–	–	–
Timber cutting and logging occupations	124	17.7	4.0	8.1	5.6	–	–	–	–
Fishers, hunters, and trappers	91	74.7	–	–	–	73.6	–	–	–
Fishers	79	73.4	–	–	–	72.2	–	–	–
Precision production, craft, and repair	1,095	19.7	10.1	2.1	5.2	2.3	5.9	4.7	1.2
Mechanics and repairers	317	23.3	13.9	2.2	4.7	2.5	9.1	6.9	2.2
Vehicle and mobile equipment mechanics, repairers, and supervisors	200	22.5	11.5	2.0	5.5	3.5	11.0	8.5	2.5
Automobile mechanics and apprentices	60	18.3	15.0	–	–	–	25.0	21.7	–
Bus, truck, and stationary engine mechanics	26	38.5	19.2	–	15.4	–	–	–	–
Heavy equipment mechanics	32	25.0	12.5	–	–	–	–	–	–
Industrial machinery repairers	24	16.7	–	–	–	–	–	–	–
Machinery maintenance occupations	11	36.4	–	–	27.3	–	–	–	–
Electrical and electronic equipment repairers	38	28.9	23.7	–	–	–	–	–	–
Electronic repairers, communications and industrial equipment	16	31.2	25.0	–	–	–	–	–	–
Heating, air conditioning, and refrigeration mechanics	16	25.0	18.8	–	–	–	–	–	–
Miscellaneous mechanics and repairers	63	22.2	14.3	–	–	–	7.9	4.8	–
Construction trades	565	18.4	8.5	2.1	6.0	1.8	1.9	1.6	–
Supervisors, construction occupations	92	31.5	15.2	–	9.8	4.3	3.3	–	–
Supervisors, n.e.c.	75	37.3	18.7	–	10.7	5.3	–	–	–
Construction trades, except supervisors	473	15.9	7.2	2.1	5.3	1.3	1.7	1.5	–
Brickmasons, stonemasons, and apprentices	20	20.0	–	–	15.0	–	–	–	–

See footnotes at end of table.

Table A-9. Fatal occupational injuries resulting from transportation incidents and homicides by occupation, 1993 — Continued

Occupation[1]	Total fatalities (number)	Transportation incidents (percent)[2]					Homicides (percent)[2]		
		Total	Highway incidents	Non-highway incidents	Worker struck by vehicle	All other transportation incidents	Total	Homicides by shooting	All other homicides
Carpenters and apprentices	90	17.8	10.0	3.3	–	–	–	–	–
Drywall installers	10	30.0	–	–	–	–	–	–	–
Electricians and apprentices	71	12.7	5.6	–	4.2	–	–	–	–
Electrical power installers and repairers	42	11.9	–	–	9.5	–	–	–	–
Painters, construction and maintenance	54	5.6	–	–	–	–	–	–	–
Plumbers, pipefitters, steamfitters, and apprentices	40	27.5	12.5	–	7.5	–	–	–	–
Paving, surfacing, and tamping equipment operators	5	60.0	–	–	60.0	–	–	–	–
Roofers	47	8.5	6.4	–	–	–	–	–	–
Extractive occupations	97	19.6	10.3	3.1	3.1	3.1	–	–	–
Supervisors, extractive occupations	12	33.3	25.0	–	–	–	–	–	–
Drillers, oil wells	27	22.2	11.1	–	–	–	–	–	–
Mining machine operators	25	12.0	–	–	–	–	–	–	–
Precision production occupations	116	16.4	7.8	–	4.3	3.4	19.8	16.4	3.4
Precision metal working occupations	32	9.4	–	–	–	–	–	–	–
Precision food production occupations	10	–	–	–	–	–	50.0	40.0	–
Bakers	4	–	–	–	–	–	75.0	–	–
Plant and system operators	24	20.8	–	–	–	–	16.7	16.7	–
Stationary engineers	11	27.3	–	–	–	–	–	–	–
Operators, fabricators, and laborers	1,959	50.2	30.4	5.2	9.3	5.3	10.4	8.5	1.9
Machine operators, assemblers, and inspectors	205	10.7	3.9	2.4	2.9	1.5	6.8	5.9	–
Metal and plastic processing machine operators	11	–	–	–	–	–	27.3	27.3	–
Machine operators, assorted materials	80	7.5	–	–	3.8	–	3.8	3.8	–
Fabricators, assemblers, and hand working occupations	74	10.8	4.1	–	–	4.1	6.8	4.1	–
Welders and cutters	58	12.1	–	–	–	5.2	6.9	–	–
Transportation and material moving occupations	1,182	66.6	45.5	5.3	8.8	6.9	11.2	9.1	2.0
Motor vehicle operators	917	70.7	56.5	3.3	7.3	3.6	14.1	11.5	2.6
Truck drivers	731	79.8	63.7	3.6	8.2	4.2	3.1	2.5	.7
Driver-sales workers	41	75.6	70.7	–	–	–	17.1	17.1	–
Bus drivers	15	60.0	33.3	–	20.0	–	–	–	–
Taxicab drivers and chauffeurs	113	13.3	9.7	–	–	–	85.8	70.8	15.0
Transportation occupations, except motor vehicles	85	70.6	–	–	16.5	51.8	–	–	–
Rail transportation occupations	42	78.6	–	–	31.0	45.2	–	–	–
Railroad conductors and yardmasters	12	91.7	–	–	41.7	50.0	–	–	–
Locomotive operating occupations	12	75.0	–	–	–	50.0	–	–	–
Railroad brake, signal, and switch operators	17	70.6	–	–	29.4	41.2	–	–	–
Water transportation occupations	43	62.8	–	–	–	58.1	–	–	–
Ship captains and mates, except fishing boats	11	90.9	–	–	–	81.8	–	–	–
Sailors and deckhands	30	56.7	–	–	–	53.3	–	–	–
Material moving equipment operators	180	43.9	10.0	18.3	12.8	2.8	1.7	1.7	–
Operating engineers	39	43.6	7.7	12.8	15.4	7.7	–	–	–
Excavating and loading machine operators	21	52.4	–	19.0	19.0	–	–	–	–
Grader, dozer, and scraper operators	27	77.8	11.1	51.9	14.8	–	–	–	–
Industrial truck and tractor equipment operators	44	31.8	6.8	18.2	6.8	–	–	–	–
Handlers, equipment cleaners, helpers, and laborers	572	30.4	8.6	5.9	12.6	3.3	10.0	8.0	1.9
Helpers, construction and extractive occupations	14	21.4	–	–	–	–	–	–	–
Construction laborers	218	28.9	8.3	4.1	15.1	1.4	1.4	–	–
Freight, stock, and material handlers	81	40.7	11.1	–	19.8	7.4	24.7	24.7	–
Garbage collectors	18	77.8	27.8	–	50.0	–	–	–	–
Stevedores	10	60.0	–	–	–	50.0	–	–	–
Stock handlers and baggers	21	–	–	–	–	–	85.7	85.7	–
Machine feeders and offbearers	8	50.0	–	–	–	–	–	–	–
Garage and service station related occupations	34	20.6	11.8	–	–	–	64.7	47.1	17.6
Laborers, except construction	202	31.7	7.9	9.9	9.9	4.0	4.5	3.0	1.5

[1] Based on the 1990 Occupational Classification System developed by the Bureau of the Census.
[2] Percentage of total fatalities in each occupation.

NOTE: Totals for major categories may include subcategories not shown separately. Percentages may not add to totals because of rounding.
Dashes indicate no data reported or data that do not meet publication criteria.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1993.

Table A-10. Fatal occupational injuries due to contact with objects and equipment by occupation, 1993

Occupation[1]	Total fatalities (number)	Contact with objects and equipment[2] (percent)			
		Total	Struck by object	Caught in or compressed by equipment or objects	Caught in or crushed in collapsing materials
Total	6,271	16.6	9.0	4.9	2.2
Managerial and professional specialty	681	7.3	5.1	1.6	–
Executive, administrative, and managerial	427	9.6	7.0	1.6	–
Managers and administrators, n.e.c.	213	14.1	10.3	2.3	–
Management related occupations	45	11.1	8.9	–	–
Professional specialty	254	3.5	2.0	1.6	–
Technical, sales, and administrative support	842	3.2	2.0	.8	–
Sales occupations	556	2.3	1.6	–	–
Supervisors and proprietors, sales occupations	247	2.4	2.0	–	–
Sales workers, retail and personal services	225	2.7	1.8	–	–
Administrative support occupations, including clerical	119	6.7	4.2	–	–
Service occupations	539	5.2	3.0	1.1	–
Protective service occupations	288	3.1	2.4	–	–
Police and detectives, including supervisors	149	4.0	3.4	–	–
Service occupations, except protective and household	243	7.4	3.7	2.5	–
Cleaning and building service occupations, except household	106	11.3	6.6	3.8	–
Janitors and cleaners	83	12.0	6.0	4.8	–
Farming, forestry, and fishing	961	32.9	19.8	9.7	2.7
Farming operators and managers	409	31.5	14.7	13.0	3.4
Farmers, except horticultural	328	31.4	14.0	13.1	4.0
Managers, farms, except horticultural	67	34.3	19.4	13.4	–
Other agricultural and related occupations	319	27.0	12.2	10.7	3.4
Farm occupations, except managerial	214	27.6	9.3	13.1	4.7
Supervisors, farm workers	25	36.0	–	20.0	–
Farm workers	184	25.5	8.7	12.0	4.3
Related agricultural occupations	105	25.7	18.1	5.7	–
Groundskeepers and gardeners, except farm	88	27.3	18.2	6.8	–
Forestry and logging occupations	142	69.0	62.7	3.5	–
Supervisors, forestry, and logging workers	11	63.6	63.6	–	–
Timber cutting and logging occupations	124	72.6	65.3	4.0	–
Precision production, craft, and repair	1,095	21.7	11.1	6.0	4.3
Mechanics and repairers	317	27.1	16.4	9.8	–
Vehicle and mobile equipment mechanics, repairers, and supervisors	200	31.5	18.5	12.0	–
Automobile mechanics and aprentices	60	20.0	20.0	–	–
Bus, truck, and stationary engine mechanics	26	42.3	23.1	15.4	–
Heavy equipment mechanics	32	43.8	25.0	15.6	–
Industrial machinery repairers	24	25.0	–	16.7	–
Miscellaneous mechanics and repairers	63	27.0	15.9	9.5	–
Construction trades	565	13.6	6.9	1.8	4.6
Supervisors, construction occupations	92	14.1	4.3	–	6.5
Supervisors, n.e.c.	75	16.0	–	–	8.0
Construction trades, except supervisors	473	13.5	7.4	1.7	4.2
Carpenters and apprentices	90	15.6	10.0	–	5.6
Plumbers, pipefitters, steamfitters, and apprentices	40	25.0	10.0	–	15.0
Structural metal workers	34	20.6	11.8	–	–
Extractive occupations	97	47.4	22.7	8.2	15.5
Drillers, oil wells	27	37.0	29.6	–	–
Mining machine operators	25	68.0	20.0	16.0	32.0
Precision production occupations	116	25.0	6.9	14.7	–
Precision metal working occupations	32	37.5	–	28.1	–
Machinists	12	58.3	–	41.7	–
Operators, fabricators, and laborers	1,959	18.0	8.5	5.9	2.9
Machine operators, assemblers, and inspectors	205	36.6	18.0	14.1	2.9
Woodworking machine operators	14	71.4	57.1	–	–
Sawing machine operators	10	70.0	60.0	–	–
Machine operators, assorted materials	80	36.2	11.2	21.2	–
Fabricators, assemblers, and hand working occupations	74	33.8	21.6	5.4	5.4
Welders and cutters	58	31.0	20.7	–	6.9
Transportation and material moving occupations	1,182	11.3	6.0	3.7	1.0
Motor vehicle operators	917	7.7	4.6	2.3	.4
Truck drivers	731	8.6	5.2	2.6	.5
Material moving equipment operators	180	32.8	15.6	12.2	4.4
Operating engineers	39	30.8	17.9	12.8	–
Hoist and winch operators	9	55.6	44.4	–	–
Excavating and loading machine operators	21	28.6	–	–	19.0
Industrial truck and tractor equipment operators	44	40.9	25.0	13.6	–
Handlers, equipment cleaners, helpers, and laborers	572	25.2	10.3	7.5	6.6
Construction laborers	218	29.4	11.0	5.0	12.4

See footnotes at end of table.

Table A-10. Fatal occupational injuries due to contact with objects and equipment by occupation, 1993 — Continued

Occupation[1]	Total fatalities (number)	Contact with objects and equipment[2] (percent)			
		Total	Struck by object	Caught in or compressed by equipment or objects	Caught in or crushed in collapsing materials
Freight, stock, and material handlers	81	19.8	6.2	12.3	–
Garage and service station related occupations	34	11.8	11.8	–	–
Laborers, except construction	202	27.7	12.9	9.4	4.5

[1] Based on the 1990 Occupational Classification System developed by the Bureau of the Census.
[2] Based on the 1992 BLS Occupational Injury and Illness Classification Structures.

NOTE: Totals for major categories may include subcategories not shown separately. Percentages may not add to totals because of rounding.

Dashes indicate no data reported or data that do not meet publication criteria.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1993.

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Table A-11. Fatal occupational injuries by industry and event or exposure, 1993

Industry[1]	Total fatalities (number)	Event or exposure[2] (percent)					
		Transportation incidents	Assaults and violent acts	Contact with objects and equipment	Falls	Exposure to harmful substances or environments	Fires and explosions
Total	6,271	39.6	20.9	16.6	9.7	9.4	3.2
Private industry	5,590	38.1	20.6	17.8	10.1	9.8	3.0
Agriculture, forestry and fishing	855	50.8	5.4	26.1	5.8	10.5	1.3
Agricultural production - crops	398	58.5	3.0	27.4	2.3	6.8	1.8
Cash grains	44	43.2	–	38.6	–	9.1	–
Field crops, except cash grains	21	76.2	–	–	–	–	–
Sugarcane and sugar beets	8	87.5	–	–	–	–	–
Field crops, except grains, nec	7	85.7	–	–	–	–	–
Vegetables and melons	14	78.6	–	–	–	–	–
Fruits and tree nuts	23	60.9	–	26.1	–	–	–
Citrus fruits	5	80.0	–	–	–	–	–
Deciduous tree fruits	12	58.3	–	–	–	–	–
Horticultural specialties	8	50.0	–	–	–	–	–
General farms, primarily crop	184	56.0	3.3	29.3	2.2	8.2	–
Agricultural production - livestock	209	39.2	10.0	35.4	4.3	9.6	–
Livestock, except dairy and poultry	60	40.0	8.3	31.7	–	11.7	–
Beef cattle feedlots	10	80.0	–	–	–	–	–
Beef cattle, except feedlots	24	25.0	–	33.3	–	16.7	–
General livestock, nec	9	44.4	–	–	–	–	–
Dairy farms	72	43.1	9.7	34.7	–	9.7	–
General farms, primarily animal	51	31.4	9.8	45.1	–	7.8	–
Agricultural services	153	33.3	7.8	22.2	19.6	17.0	–
Crop services	31	64.5	–	16.1	–	–	–
Crop planting and protecting	17	88.2	–	–	–	–	–
Animal services, except veterinary	7	–	57.1	–	–	–	–
Animal specialty services	6	–	66.7	–	–	–	–
Farm labor and management services	11	90.9	–	–	–	–	–
Farm management services	4	100.0	–	–	–	–	–
Landscape and horticultural services	92	17.4	5.4	27.2	28.3	21.7	–
Lawn and garden services	17	–	–	–	29.4	29.4	–
Ornamental shrub and tree services	53	15.1	–	32.1	30.2	20.8	–
Fishing, hunting, and trapping	87	74.7	–	–	–	18.4	–
Commercial fishing	84	73.8	–	–	–	19.0	–
Finfish	31	96.8	–	–	–	–	–
Shellfish	42	64.3	–	–	–	26.2	–
Mining	174	27.0	2.9	42.0	8.0	14.4	4.6
Metal mining	17	29.4	–	47.1	–	–	–
Copper ores	7	–	–	100.0	–	–	–
Coal mining	40	12.5	–	70.0	–	15.0	–
Bituminous coal and lignite mining	39	12.8	–	71.8	–	12.8	–
Oil and gas extraction	94	33.0	4.3	31.9	9.6	14.9	4.3
Crude petroleum and natural gas	14	35.7	–	35.7	–	–	–
Oil and gas field services	79	32.9	–	31.6	11.4	16.5	5.1
Nonmetallic minerals, except fuels	23	26.1	–	30.4	17.4	17.4	–
Sand and gravel	7	57.1	–	–	–	–	–
Construction	924	25.2	4.0	20.2	29.5	17.2	3.5
General building contractors	152	23.0	5.3	21.1	37.5	9.9	2.6
Residential building construction	62	16.1	6.5	17.7	41.9	9.7	6.5
Nonresidential building construction	70	25.7	–	25.7	34.3	11.4	–
Heavy construction, except building	255	37.3	3.1	28.6	11.4	16.1	3.5
Highway and street construction	72	61.1	–	22.2	11.1	–	–
Heavy construction, except highway	176	27.3	4.0	31.2	11.9	21.6	4.0
Special trades contractors	517	19.9	4.1	15.9	36.2	19.9	3.7
Plumbing, heating and air-conditioning	46	23.9	–	30.4	23.9	15.2	–
Painting and paper hanging	40	12.5	–	–	57.5	25.0	–
Electrical work	67	19.4	–	6.0	16.4	52.2	–
Masonry, stonework, tile setting, and plastering	41	22.0	–	22.0	48.8	–	–
Carpentry and floor work	38	18.4	–	21.1	31.6	15.8	–
Roofing, siding, and sheet metal work	84	13.1	–	6.0	66.7	13.1	–
Concrete work	18	38.9	–	–	–	27.8	–
Water well drilling	10	–	–	–	–	50.0	–
Miscellaneous special trade contractors	158	22.8	5.1	20.3	31.0	12.0	8.2
Structural steel erection	41	–	–	9.8	65.9	12.2	–
Excavation work	33	36.4	–	39.4	–	–	–
Special trade contractors, n.e.c.	56	30.4	–	–	32.1	19.6	7.1
Manufacturing	762	29.1	9.1	36.2	8.0	10.6	5.9
Food and kindred products	82	35.4	9.8	24.4	9.8	14.6	6.1
Meat products	19	21.1	–	36.8	–	21.1	–
Dairy products	6	66.7	–	–	–	–	–
Preserved fruits and vegetables	9	55.6	–	–	–	–	–
Grain mill products	11	36.4	–	–	–	–	–

See footnotes at end of table.

Table A-11. Fatal occupational injuries by industry and event or exposure, 1993 — Continued

Industry[1]	Total fatalities (number)	Event or exposure[2] (percent)					
		Transportation incidents	Assaults and violent acts	Contact with objects and equipment	Falls	Exposure to harmful substances or environments	Fires and explosions
Bakery products	8	75.0	-	-	-	-	-
Sugar and confectionery products	8	-	-	50.0	-	-	-
Miscellaneous food and kindred products	8	50.0	-	-	-	-	-
Textile mill products	19	-	26.3	31.6	-	-	-
Textile finishing, except wool	4	-	-	100.0	-	-	-
Lumber and wood products	204	28.4	2.5	63.2	3.4	2.0	-
Logging	147	30.6	-	63.3	-	-	-
Sawmills and planing mills	29	17.2	-	75.9	-	-	-
Millwork, plywood and structural members	12	-	-	41.7	33.3	-	-
Miscellaneous wood products	9	-	-	55.6	-	-	-
Furniture and fixtures	8	62.5	-	-	-	-	-
Paper and allied products	15	33.3	-	-	-	-	-
Printing and publishing	37	64.9	21.6	-	-	-	-
Newspapers	21	71.4	19.0	-	-	-	-
Commercial printing	9	55.6	-	-	-	-	-
Chemicals and allied products	32	15.6	15.6	12.5	-	18.8	28.1
Petroleum and coal products	17	23.5	-	-	-	41.2	23.5
Petroleum refining	15	-	-	-	-	46.7	26.7
Rubber and miscellaneous plastics products	29	24.1	13.8	20.7	-	17.2	13.8
Miscellaneous plastics products, nec	23	26.1	17.4	17.4	-	17.4	-
Stone, clay, glass and concrete products	53	24.5	-	45.3	13.2	13.2	-
Concrete, gypsum, and plaster products	37	18.9	-	48.6	10.8	18.9	-
Primary metal industries	71	12.7	8.5	38.0	15.5	14.1	11.3
Blast furnace and basic steel products	32	12.5	-	40.6	18.8	-	15.6
Iron and steel foundries	10	-	-	50.0	-	-	-
Fabricated metal products	46	15.2	8.7	37.0	8.7	17.4	8.7
Fabricated structural metal products	19	31.6	-	31.6	-	-	-
Metal forgings and stampings	6	-	-	66.7	-	-	-
Industrial machinery and equipment	44	29.5	9.1	38.6	9.1	9.1	-
Construction and related machinery	9	-	-	55.6	-	-	-
Metalworking machinery	9	-	-	55.6	-	-	-
Electronic and other electronic equipment	18	38.9	33.3	-	-	-	-
Transportation equipment	55	43.6	9.1	18.2	10.9	10.9	-
Motor vehicles and equipment	16	37.5	-	25.0	-	-	-
Aircraft and parts	15	60.0	-	-	-	-	-
Ship and boat building and repairing	18	38.9	-	22.2	-	-	-
Miscellaneous manufacturing industries	15	46.7	-	-	-	-	-
Miscellaneous manufactures	11	45.5	-	-	-	-	-
Transportation and public utilities	890	65.1	15.7	8.1	3.3	4.7	2.5
Railroad transportation	44	84.1	-	-	-	-	-
Railroads	44	84.1	-	-	-	-	-
Local and interurban passenger transportation	130	17.7	78.5	-	-	-	-
Local and suburban transportation	11	45.5	45.5	-	-	-	-
Taxicabs	106	8.5	90.6	-	-	-	-
Trucking and warehousing	468	79.1	5.1	9.2	2.4	1.9	1.5
Trucking and courier services, except air	426	80.5	4.9	8.7	1.6	1.9	1.4
Local trucking, without storage	108	79.6	-	14.8	-	-	-
Trucking, except local	211	83.9	4.3	5.2	-	1.9	1.9
Courier services, except by air	14	100.0	-	-	-	-	-
Public warehousing and storage	19	36.8	-	-	21.1	-	-
Trucking terminal facilities	8	75.0	-	-	-	-	-
Water transportation	51	47.1	-	7.8	11.8	17.6	9.8
Water transportation services	40	47.5	-	-	10.0	17.5	12.5
Transportation by air	79	87.3	-	5.1	-	-	-
Air transportation, scheduled	33	84.8	-	-	-	-	-
Air transportation, nonscheduled	27	96.3	-	-	-	-	-
Airports, flying fields, and services	19	78.9	-	-	-	-	-
Transportation services	21	57.1	-	-	-	-	-
Freight transportation arrangement	11	72.7	-	-	-	-	-
Communications	25	68.0	-	-	-	16.0	-
Telephone communications	14	57.1	-	-	-	-	-
Radio and television broadcasting	7	85.7	-	-	-	-	-
Electric, gas, and sanitary services	72	37.5	6.9	19.4	5.6	22.2	8.3
Electric services	23	21.7	-	-	-	34.8	-
Combination utility services	12	-	-	-	-	41.7	-
Sanitary services	29	62.1	-	27.6	-	-	-
Wholesale trade	250	55.2	15.2	12.8	8.0	3.6	4.0
Wholesale trade–durable goods	137	50.4	13.9	19.0	8.8	2.9	3.6
Motor vehicles, parts, and supplies	15	40.0	26.7	-	-	-	-
Lumber and construction materials	18	55.6	-	-	-	-	-
Professional and commercial equipment	13	69.2	-	-	-	-	-
Metals and minerals, except petroleum	9	-	-	55.6	-	-	-
Hardware, plumbing and heating equipment	10	80.0	-	-	-	-	-
Machinery, equipment, and supplies	30	66.7	-	-	-	-	-

See footnotes at end of table.

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Table A-11. Fatal occupational injuries by industry and event or exposure, 1993 — Continued

Industry[1]	Total fatalities (number)	Event or exposure[2] (percent)					
		Transportation incidents	Assaults and violent acts	Contact with objects and equipment	Falls	Exposure to harmful substances or environments	Fires and explosions
Miscellaneous durable goods	34	29.4	17.6	32.4	–	–	14.7
Wholesale trade--nondurable goods	113	61.1	16.8	5.3	7.1	4.4	4.4
Groceries and related products	42	69.0	21.4	–	–	–	–
Farm-product raw materials	17	47.1	–	–	–	–	–
Petroleum and petroleum products	13	69.2	–	–	–	–	–
Beer, wine, and distilled beverages	11	72.7	–	–	–	–	–
Miscellaneous nondurable goods	21	57.1	–	–	–	–	–
Retail trade	784	18.2	70.4	4.7	2.3	2.9	.9
Building materials and garden supplies	32	28.1	25.0	25.0	–	–	–
Lumber and other building materials	20	35.0	–	25.0	–	–	–
Mobile home dealers	5	–	80.0	–	–	–	–
General merchandise stores	26	30.8	42.3	19.2	–	–	–
Department stores	14	28.6	42.9	–	–	–	–
Food stores	223	7.2	89.2	–	1.8	–	–
Grocery stores	199	5.5	90.5	–	2.0	–	–
Retail bakeries	11	–	72.7	–	–	–	–
Automotive dealers and service stations	138	28.3	53.6	8.0	2.9	4.3	–
New and used car dealers	30	60.0	23.3	–	–	–	–
Used car dealers	7	–	57.1	–	–	–	–
Auto and home supply stores	22	50.0	27.3	–	–	–	–
Gasoline service stations	68	7.4	79.4	7.4	–	–	–
Apparel and accessory stores	23	21.7	73.9	–	–	–	–
Family clothing stores	7	–	85.7	–	–	–	–
Shoe stores	5	–	80.0	–	–	–	–
Furniture and homefurnishings stores	25	28.0	56.0	–	–	–	–
Radio, television, and computer stores	11	–	81.8	–	–	–	–
Eating and drinking places	199	15.1	75.9	2.5	2.0	3.5	–
Eating places	113	17.7	73.5	–	–	–	–
Drinking places	39	–	92.3	–	–	–	–
Miscellaneous retail	118	24.6	66.1	3.4	–	–	–
Drug stores and proprietary stores	7	–	71.4	–	–	–	–
Liquor stores	23	–	95.7	–	–	–	–
Used merchandise stores	15	–	80.0	–	–	–	–
Miscellaneous shopping goods stores	23	–	73.9	–	–	–	–
Nonstore retailers	22	45.5	45.5	–	–	–	–
Fuel dealers	10	70.0	–	–	–	–	–
Retail stores, nec	16	25.0	68.8	–	–	–	–
Finance, insurance, and real estate	116	31.0	39.7	3.4	14.7	11.2	–
Depository institutions	10	50.0	–	–	–	–	–
Commercial banks	7	57.1	–	–	–	–	–
Security and commodity brokers	8	50.0	–	–	–	–	–
Insurance carriers	13	30.8	61.5	–	–	–	–
Fire, marine, and casualty insurance	6	–	66.7	–	–	–	–
Insurance agents, brokers, and service	15	73.3	–	–	–	–	–
Real estate	64	14.1	43.8	–	23.4	15.6	–
Real estate operators and lessors	35	11.4	37.1	–	25.7	20.0	–
Real estate agents and managers	25	20.0	52.0	–	20.0	–	–
Services	758	35.2	27.8	9.9	9.4	12.9	3.8
Hotels and other lodging places	33	27.3	33.3	15.2	–	18.2	–
Hotels and motels	25	28.0	36.0	–	–	16.0	–
Personal services	30	20.0	70.0	–	–	–	–
Laundry, cleaning, and garment services	12	–	66.7	–	–	–	–
Beauty shops	9	–	88.9	–	–	–	–
Business services	188	32.4	26.1	9.0	15.4	12.2	4.3
Advertising	13	46.2	–	–	–	–	–
Services to buildings	31	32.3	–	–	41.9	–	–
Miscellaneous equipment rental and leasing	8	50.0	–	–	–	–	–
Personnel supply services	45	35.6	11.1	17.8	17.8	11.1	–
Computer and data processing services	7	57.1	–	–	–	–	–
Miscellaneous business services	82	23.2	45.1	4.9	6.1	14.6	6.1
Detective and armored car services	44	15.9	70.5	–	–	–	–
Automotive repair, services, and parking	116	22.4	31.9	22.4	–	11.2	9.5
Automotive rentals, no drivers	8	62.5	–	–	–	–	–
Automotive repair shops	83	9.6	39.8	21.7	–	13.3	13.3
Automotive services, except repair	23	52.2	–	26.1	–	–	–
Miscellaneous repair services	49	20.4	20.4	22.4	8.2	22.4	–
Miscellaneous repair shops	35	22.9	17.1	22.9	–	22.9	–
Motion pictures	23	34.8	56.5	–	–	–	–
Motion picture production and services	11	72.7	–	–	–	–	–
Video tape rental	10	–	100.0	–	–	–	–
Amusement and recreation services	77	50.6	15.6	5.2	11.7	15.6	–
Commercial sports	6	66.7	–	–	–	–	–
Miscellaneous amusement, recreation services	70	50.0	15.7	5.7	11.4	15.7	–
Health services	65	38.5	30.8	7.7	–	12.3	–

See footnotes at end of table.

Table A-11. Fatal occupational injuries by industry and event or exposure, 1993 — Continued

Industry[1]	Total fatalities (number)	Event or exposure[2] (percent)					
		Transportation incidents	Assaults and violent acts	Contact with objects and equipment	Falls	Exposure to harmful substances or environments	Fires and explosions
Offices and clinics of medical doctors	6	–	66.7	–	–	–	–
Nursing and personal care facilities	9	–	44.4	–	–	–	–
Hospitals	26	34.6	19.2	–	–	15.4	–
Legal services	14	–	71.4	–	–	–	–
Educational services	28	78.6	14.3	–	–	–	–
Colleges and universities	7	85.7	–	–	–	–	–
Schools and educational services, nec	10	100.0	–	–	–	–	–
Social services	28	35.7	25.0	–	–	21.4	–
Individual and family services	7	57.1	–	–	–	–	–
Residential care	10	–	–	–	–	40.0	–
Membership organizations	40	37.5	12.5	–	30.0	12.5	–
Business associations	7	57.1	–	–	–	–	–
Religious organizations	25	36.0	16.0	–	28.0	–	–
Engineering and management services	44	56.8	15.9	–	–	20.5	–
Engineering and architectural services	21	66.7	–	–	–	28.6	–
Research and testing services	10	70.0	–	–	–	–	–
Private households	14	35.7	–	–	–	–	–
Government[3]	681	52.0	23.2	6.6	6.6	6.0	5.1
Federal government (including resident armed forces)	186	61.3	16.1	7.0	7.0	4.3	3.8
Transportation and public utilities	16	43.8	43.8	–	–	–	–
U.S. Postal Service	13	38.5	53.8	–	–	–	–
Public administration	161	64.0	13.0	7.5	6.8	4.3	4.3
Executive, legislative, and general government	6	–	66.7	–	–	–	–
Justice, public order, and safety	7	–	85.7	–	–	–	–
Public order and safety	7	–	85.7	–	–	–	–
Police protection	7	–	85.7	–	–	–	–
Administration of economic programs	12	83.3	–	–	–	–	–
National security and international affairs	129	66.7	8.5	9.3	6.2	4.7	4.7
National security	129	66.7	8.5	9.3	6.2	4.7	4.7
State government	146	63.7	17.8	5.5	4.8	4.8	–
Construction	17	58.8	–	–	–	–	–
Heavy construction, except building	17	58.8	–	–	–	–	–
Highway and street construction	17	58.8	–	–	–	–	–
Transportation and public utilities	7	71.4	–	–	–	–	–
Services	30	50.0	23.3	–	–	–	–
Educational services	17	64.7	–	–	–	–	–
Elementary and secondary schools	6	83.3	–	–	–	–	–
Colleges and universities	10	60.0	–	–	–	–	–
Public administration	91	68.1	19.8	4.4	–	–	–
Executive, legislative, and general government	11	72.7	–	–	–	–	–
Justice, public order, and safety	37	59.5	32.4	–	–	–	–
Public order and safety	36	58.3	33.3	–	–	–	–
Police protection	23	52.2	39.1	–	–	–	–
Correctional institutions	12	66.7	–	–	–	–	–
Administration of human resources	10	70.0	–	–	–	–	–
Environmental quality and housing	10	50.0	–	–	–	–	–
Administration of economic programs	21	90.5	–	–	–	–	–
Local government	340	41.8	29.7	6.8	7.1	7.4	7.4
Construction	21	61.9	–	19.0	–	–	–
Heavy construction, except building	19	68.4	–	21.1	–	–	–
Highway and street construction	17	70.6	–	–	–	–	–
Transportation and public utilities	46	30.4	30.4	8.7	8.7	15.2	–
Local and interurban passenger transportation	15	–	66.7	–	–	–	–
Local and suburban transportation	15	–	66.7	–	–	–	–
Electric, gas, and sanitary services	28	35.7	14.3	–	–	21.4	–
Electric services	8	–	–	–	–	50.0	–
Sanitary services	12	50.0	–	–	–	–	–
Services	60	33.3	28.3	8.3	11.7	13.3	–
Educational services	42	31.0	28.6	–	14.3	14.3	–
Elementary and secondary schools	35	31.4	25.7	–	14.3	17.1	–
Public administration	207	44.9	32.4	4.3	5.8	3.9	8.7
Executive, legislative, and general government	59	45.8	27.1	6.8	10.2	6.8	–

See footnotes at end of table.

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Table A-11. Fatal occupational injuries by industry and event or exposure, 1993 — Continued

Industry[1]	Total fatalities (number)	Event or exposure[2] (percent)					
		Transportation incidents	Assaults and violent acts	Contact with objects and equipment	Falls	Exposure to harmful substances or environments	Fires and explosions
Executive offices	13	53.8	30.8	–	–	–	–
Executive and legislative combined	30	40.0	33.3	–	–	–	–
Justice, public order, and safety	128	42.2	35.2	3.9	3.1	3.1	12.5
Public order and safety	128	42.2	35.2	3.9	3.1	3.1	12.5
Police protection	86	44.2	48.8	–	–	–	–
Fire protection	35	37.1	–	–	–	–	45.7
Environmental quality and housing	12	50.0	33.3	–	–	–	–

[1] *Standard Industrial Classification Manual*, 1987 Edition.
[2] Based on the 1992 BLS Occupational Injury and Illness Classification Structures. Includes other events and exposures, such as bodily reaction, in addition to those shown separately.
[3] Includes fatalities to workers employed by governmental organizations regardless of industry.

NOTE: Totals for major categories may include subcategories not shown separately. Percentages may not add to totals because of rounding.

Dashes indicate no data reported or data that do not meet publication criteria.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1993.

Table A-12. Fatal occupational injuries by occupation and selected nature of injury, 1993

Occupation[1]	Total fatalities (number)	Nature[2] (percent)					
		Gunshot wounds	Asphyxiations, strangulations, suffocations[3]	Drownings	Electrocutions	Burns[4]	Poisonings and toxic effects[5]
Total	6,271	16.2	5.1	3.8	5.1	2.5	2.5
Managerial and professional specialty	681	24.1	3.7	3.1	3.4	–	3.5
Executive, administrative, and managerial	427	29.0	4.0	.9	3.3	–	3.7
Administrators, education and related fields	6	66.7	–	–	–	–	–
Managers, food serving and lodging establishments	84	64.3	–	–	–	–	–
Managers, properties and real estate	19	38.8	–	–	–	–	–
Managers, service organizations, n.e.c.	15	40.0	–	–	–	–	–
Managers and administrators, n.e.c.	213	17.8	6.6	–	3.3	–	4.2
Management related occupations	45	13.3	–	–	–	–	–
Accountants and auditors	12	41.7	–	–	–	–	–
Professional specialty	254	15.7	3.1	6.7	3.5	–	3.1
Engineers, architects, and surveyors	54	–	–	–	9.3	–	–
Health diagnosing occupations	16	25.0	–	–	–	–	–
Health assessment and treating occupations	32	18.8	–	–	–	–	–
Teachers, except postsecondary	29	17.2	–	–	–	–	–
Lawyers and judges	11	72.7	–	–	–	–	–
Lawyers	11	72.7	–	–	–	–	–
Writers, artists, entertainers, and athletes	48	12.5	–	14.6	–	–	–
Athletes	15	–	–	46.7	–	–	–
Technical, sales, and administrative support	842	43.1	3.2	.6	1.2	1.2	1.7
Technicians and related support occupations	167	–	–	–	2.4	–	2.4
Engineering and related technologists and technicians	18	–	–	–	22.2	–	–
Sales occupations	556	57.2	3.8	–	.9	1.1	1.6
Supervisors and proprietors, sales occupations	247	70.4	3.2	–	–	–	–
Sales representatives, finance and business services	45	26.7	–	–	–	–	–
Real estate sales occupations	11	45.5	–	–	–	–	–
Sales workers, retail and personal services	225	57.8	4.0	–	–	–	–
Sales workers, motor vehicles and boats	17	41.2	–	–	–	–	–
Sales counter clerks	24	62.5	–	–	–	–	–
Cashiers	101	74.3	–	–	–	–	–
News vendors	14	28.6	–	–	–	–	–
Administrative support occupations, including clerical	119	35.3	4.2	–	–	–	–
Supervisors, administrative support occupations	7	57.1	–	–	–	–	–
Secretaries, stenographers, and typists	18	55.6	–	–	–	–	–
Secretaries	18	55.6	–	–	–	–	–
Mail and message distributing occupations	29	13.8	–	–	–	–	–
Mail carriers, postal service	12	33.3	–	–	–	–	–
Material recording, scheduling, and distributing clerks	20	25.0	–	–	–	–	–
Dispatchers	5	80.0	–	–	–	–	–
Miscellaneous administrative support	21	52.4	–	–	–	–	–
General office clerks	13	46.2	–	–	–	–	–
Service occupations	539	37.1	4.3	3.2	2.4	2.2	4.3
Protective service occupations	288	44.4	3.1	2.8	–	2.8	3.8
Firefighting and fire prevention occupations, including supervisors	39	–	–	–	–	17.9	12.8
Firefighting occupations	36	–	–	–	–	13.9	13.9
Police and detectives, including supervisors	149	49.7	–	–	–	–	–
Police and detectives, public services	101	57.4	–	–	–	–	–
Sheriffs, bailiffs, and other law enforcement officers	28	39.3	–	–	–	–	–
Guards	100	53.0	6.0	5.0	–	–	5.0
Guards and police, except public service	86	60.5	4.7	–	–	–	5.8
Service occupations, except protective and household	243	28.4	5.8	3.3	4.1	1.6	4.5
Food preparation and service occupations	77	57.1	–	–	–	–	–
Supervisors, food preparation and service occupations	4	100.0	–	–	–	–	–
Bartenders	8	50.0	–	–	–	–	–
Waiters and waitresses	13	30.8	–	–	–	–	–
Cooks	17	70.6	–	–	–	–	–
Food counter, fountain and related occupations	9	66.7	–	–	–	–	–
Miscellaneous food preparation occupations	15	66.7	–	–	–	–	–
Health service occupations	16	37.5	–	–	–	–	–
Cleaning and building service occupations, except household	106	7.5	10.4	–	6.6	3.8	6.6
Janitors and cleaners	83	8.4	10.8	–	6.0	–	6.0
Personal service occupations	44	25.0	–	11.4	–	–	–
Hairdressers and cosmetologists	7	57.1	–	–	–	–	–
Farming, forestry, and fishing	961	1.7	8.8	10.8	4.0	1.2	1.5
Farming operators and managers	409	1.2	12.2	2.0	2.7	1.2	2.4
Farmers, except horticultural	328	1.2	11.9	2.1	2.4	–	2.4
Managers, farms, except horticultural	67	–	14.9	–	–	–	–
Other agricultural and related occupations	319	2.5	8.2	6.3	8.2	1.6	–
Farm occupations, except managerial	214	–	8.9	6.5	4.7	1.9	–
Farm workers	184	–	8.2	6.5	4.3	2.2	–
Related agricultural occupations	105	4.8	6.7	5.7	15.2	–	–

See footnotes at end of table.

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Table A-12. Fatal occupational injuries by occupation and selected nature of injury, 1993 — Continued

Occupation[1]	Total fatalities (number)	Nature[2] (percent)					
		Gunshot wounds	Asphyxiations, strangulations, suffocations[3]	Drownings	Electrocutions	Burns[4]	Poisonings and toxic effects[5]
Groundskeepers and gardeners, except farm	88	5.7	5.7	5.7	17.0	–	–
Forestry and logging occupations	142	–	5.6	–	–	–	–
Timber cutting and logging occupations	124	–	5.6	–	–	–	–
Fishers, hunters, and trappers	91	–	–	82.4	–	–	–
Fishers	79	–	–	84.8	–	–	–
Precision production, craft, and repair	1,095	6.1	4.7	2.6	14.4	2.8	3.1
Mechanics and repairers	317	9.8	7.3	1.9	12.9	3.5	3.8
Vehicle and mobile equipment mechanics, repairers, and supervisors	200	12.0	7.0	2.0	7.0	5.0	4.0
Automobile mechanics and apprentices	60	26.7	–	–	–	–	8.3
Bus, truck, and stationary engine mechanics	26	–	15.4	–	–	–	–
Heavy equipment mechanics	32	–	12.5	–	–	–	–
Industrial machinery repairers	24	–	–	–	20.8	–	–
Electrical and electronic equipment repairers	38	–	–	–	34.2	–	–
Electronic repairers, communications and industrial equipment	16	–	–	–	43.8	–	–
Heating, air conditioning, and refrigeration mechanics	16	–	–	–	37.5	–	–
Miscellaneous mechanics and repairers	63	6.3	11.1	–	12.7	–	–
Construction trades	565	2.5	3.0	1.6	18.1	1.8	3.2
Supervisors, construction occupations	92	4.3	–	–	5.4	–	4.3
Construction trades, except supervisors	473	2.1	3.0	1.5	20.5	1.9	3.0
Carpenters and apprentices	90	–	5.6	–	12.2	–	–
Electricians and apprentices	71	–	–	–	52.1	–	–
Electrical power installers and repairers	42	–	–	–	52.4	–	–
Painters, construction and maintenance	54	–	–	–	18.5	–	14.8
Plumbers, pipefitters, steamfitters, and apprentices	40	–	–	–	10.0	–	–
Roofers	47	–	–	–	10.6	–	–
Extractive occupations	97	–	4.1	7.2	10.3	–	–
Drillers, oil wells	27	–	–	14.8	–	–	–
Precision production occupations	116	17.2	6.9	5.2	4.3	6.0	–
Precision food production occupations	10	40.0	–	–	–	–	–
Plant and system operators	24	16.7	–	–	–	–	–
Operators, fabricators, and laborers	1,959	9.1	5.1	2.7	3.6	4.2	2.2
Machine operators, assemblers, and inspectors	205	6.8	4.4	2.0	6.3	10.2	4.4
Metal and plastic processing machine operators	11	36.4	–	–	–	–	–
Machine operators, assorted materials	80	–	5.0	–	7.5	15.0	6.2
Furnace, kiln, and oven operators except food	8	–	–	–	–	50.0	–
Fabricators, assemblers, and hand working occupations	74	5.4	5.4	–	–	9.5	5.4
Welders and cutters	58	–	–	–	–	12.1	6.9
Transportation and material moving occupations	1,182	9.6	4.4	2.6	1.6	3.8	1.4
Motor vehicle operators	917	11.9	4.5	1.1	1.0	4.5	1.4
Truck drivers	731	2.9	5.1	1.1	1.1	5.6	1.5
Driver-sales workers	41	17.1	–	–	–	–	–
Taxicab drivers and chauffeurs	113	70.8	–	–	–	–	–
Transportation occupations, except motor vehicles	85	–	–	24.7	4.7	–	–
Water transportation occupations	43	–	–	48.8	–	–	–
Ship captains and mates, except fishing boats	11	–	–	63.6	–	–	–
Sailors and deckhands	30	–	–	43.3	–	–	–
Material moving equipment operators	180	2.8	5.0	–	3.3	–	–
Handlers, equipment cleaners, helpers, and laborers	572	8.9	6.8	3.0	6.8	2.8	3.0
Helpers, construction and extractive occupations	14	–	–	–	28.6	–	–
Construction laborers	218	–	8.3	3.2	7.8	1.8	1.8
Freight, stock, and material handlers	81	24.7	–	6.2	–	–	–
Stevedores	10	–	–	50.0	–	–	–
Stock handlers and baggers	21	85.7	–	–	–	–	–
Garage and service station related occupations	34	47.1	–	–	–	–	–
Laborers, except construction	202	5.0	8.4	2.5	6.9	5.4	3.0

[1] Based on the 1990 Occupational Classification System developed by the Bureau of the Census.
[2] Based on the 1992 BLS Occupational Injury and Illness Classification Structures. The nature of injury identifies the principal physical characteristics of the injury.
[3] May include some asphyxiations due to chest compressions.
[4] Includes chemical and heat burns.
[5] Includes poisoning and carbon monoxide poisoning; asphyxia and other toxic effects from gas, fumes, and chemical vapors; and reactions to venomous animal or insect bites.

NOTE: Totals for major categories may include subcategories not shown separately. Percentages may not add to totals because of rounding.
Dashes indicate no data reported or data that do not meet publication criteria.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1993.

Table A-13. Fatal occupational injuries by event or exposure and time of incident, 1993

Event or exposure[1]	Total fatalities (number)	Time of incident[2] (percent)					
		6am-10am	10am-2pm	2pm-6pm	6pm-10pm	10pm-2am	2am-6am
Total	6,271	17.3	27.0	23.7	11.0	8.0	6.1
Transportation incidents	2,482	18.3	26.1	25.7	11.9	7.1	7.3
Highway	1,232	20.6	25.6	24.1	11.4	6.9	9.2
Collision between vehicles, mobile equipment	652	21.2	28.8	26.1	9.4	5.7	7.5
Re-entrant collision	13	–	23.1	46.2	–	–	–
Moving in same direction	99	24.2	25.3	27.3	7.1	4.0	11.1
Moving in opposite directions, oncoming	244	24.6	28.3	27.0	10.7	4.9	3.7
Moving in intersection	120	16.7	34.2	24.2	10.8	8.3	3.3
Moving and standing vehicle, mobile equipment-in roadway	30	20.0	23.3	30.0	–	–	16.7
Moving and standing vehicle, mobile equipment-side of road	22	18.2	36.4	18.2	–	–	22.7
Vehicle struck stationary object or equipment in roadway	29	–	24.1	13.8	17.2	10.3	27.6
Vehicle struck stationary object or equipment on side of road	159	23.9	15.7	25.2	13.8	8.8	10.7
Noncollision	333	19.5	24.6	21.3	14.4	7.2	10.5
Jack-knifed or overturned--no collision	235	21.7	26.0	21.7	11.5	7.7	10.2
Ran off highway--no collision	57	14.0	14.0	14.0	31.6	5.3	15.8
Sudden start or stop, n.e.c.	7	–	–	57.1	–	–	–
Nonhighway (farm, industrial premises)	392	11.2	31.1	33.2	11.7	3.3	2.6
Collision between vehicles or mobile equipment	13	30.8	23.1	–	–	–	–
Vehicle, mobile equipment struck stationary object	22	13.6	31.8	31.8	–	13.6	–
Noncollision accident	342	10.5	31.9	33.3	12.9	2.3	2.0
Fall from moving vehicle, mobile equipment	18	–	33.3	38.9	–	–	–
Fell from and struck by vehicle, mobile equipment	87	12.6	37.9	33.3	12.6	–	–
Overturned	212	8.0	30.2	34.4	13.2	2.8	2.8
Aircraft	280	10.7	20.4	32.9	21.1	8.6	3.6
Worker struck by vehicle, mobile equipment	361	21.9	30.7	20.8	8.0	9.1	6.9
Worker struck by vehicle, mobile equipment in roadway	126	16.7	27.8	23.8	7.9	10.3	10.3
Worker struck by vehicle, mobile equipment on side of road	54	35.2	29.6	13.0	5.6	7.4	9.3
Worker struck by vehicle, mobile equipment in parking lot or non-road area	150	23.3	32.0	22.0	10.0	10.0	2.0
Water vehicle	119	16.0	11.8	22.7	13.4	9.2	16.8
Collision	4	–	–	–	–	–	75.0
Fall from ship or boat, n.e.c.	44	18.2	20.5	27.3	13.6	9.1	11.4
Sinking, capsized water vehicle	53	17.0	5.7	22.6	17.0	11.3	20.8
Railway	85	27.1	34.1	15.3	7.1	8.2	3.5
Collision between railway vehicles	7	–	–	–	–	71.4	–
Collision between railway vehicle and other vehicle	63	34.9	36.5	15.9	7.9	–	–
Assaults and violent acts	1,309	13.0	15.5	15.4	16.6	17.3	10.2
Homicides	1,063	10.3	14.6	15.6	17.8	20.0	11.1
Shooting	874	10.5	14.6	15.6	19.5	20.4	11.1
Stabbing	95	9.5	9.5	18.9	11.6	22.1	12.6
Self-inflicted injury	215	24.2	17.7	14.4	12.1	5.6	6.5
Assaults by animals	31	25.8	32.3	16.1	–	–	–
Contact with objects and equipment	1,039	19.2	36.5	26.5	7.1	3.7	2.6
Struck by object	563	19.2	37.1	26.6	7.1	2.3	2.7
Struck by falling object	345	20.6	39.4	23.2	6.1	2.3	1.2
Struck by flying object	81	12.3	40.7	28.4	8.6	4.9	3.7
Struck by swinging or slipping object	33	24.2	27.3	39.4	–	–	–
Struck by rolling, sliding objects on floor or ground level	62	14.5	30.6	33.9	8.1	–	8.1
Caught in or compressed by equipment or objects	308	19.5	37.3	23.7	7.8	4.9	3.2
Caught in running equipment or machinery	150	17.3	32.0	26.0	10.7	6.0	5.3
Compressed or pinched by rolling, sliding, or shifting objects	56	26.8	37.5	21.4	5.4	5.4	–
Caught in or crushed in collapsing materials	138	18.1	37.0	28.3	6.5	6.5	–
Excavation or trenching cave-in	38	31.6	39.5	23.7	–	–	–
Other cave-in	23	26.1	–	26.1	–	30.4	–
Caught in or crushed in collapsing structure	27	–	40.7	37.0	–	–	–
Falls	611	18.8	32.6	26.8	6.4	3.8	2.1
Fall to lower level	530	20.0	33.4	27.7	5.1	3.6	2.3
Fall down stairs or steps	23	–	13.0	39.1	–	–	–
Fall from floor, dock, or ground level	38	15.8	31.6	23.7	–	–	7.9
Fall from ladder	75	18.7	38.7	28.0	–	–	–
Fall from piled or stacked material	6	50.0	–	–	–	–	–
Fall from roof	120	23.3	36.7	29.2	3.3	–	–
Fall from scaffold, staging	71	21.1	33.8	22.5	4.2	9.9	–
Fall from building girders or other structural steel	40	25.0	40.0	22.5	–	–	–
Fall from nonmoving vehicle	32	18.8	12.5	31.2	21.9	–	9.4
Fall on same level	46	10.9	34.8	19.6	15.2	6.5	–
Exposure to harmful substances or environments	590	16.1	33.9	25.6	7.6	4.2	3.1
Contact with electric current	324	18.8	36.7	28.1	6.2	2.8	1.9

See footnotes at end of table.

000103

Table A-13. Fatal occupational injuries by event or exposure and time of incident, 1993 — Continued

Event or exposure[1]	Total fatalities (number)	Time of incident[2] (percent)					
		6am-10am	10am-2pm	2pm-6pm	6pm-10pm	10pm-2am	2am-6am
Contact with electric current of machine, tool, appliance, light fixture	44	20.5	25.0	27.3	9.1	9.1	–
Contact with wiring, transformers, or other electrical component	99	13.1	47.5	19.2	8.1	4.0	4.0
Contact with overhead power lines	115	24.3	40.9	32.2	–	–	–
Struck by lightning	16	–	18.8	62.5	–	–	–
Contact with temperature extremes	38	–	18.4	39.5	13.2	–	10.5
Exposure to environmental heat	22	–	18.2	54.5	–	–	–
Contact with hot objects or substances	11	–	–	27.3	–	–	–
Exposure to caustic, noxious, or allergenic substances	116	15.5	31.0	14.7	8.6	7.8	3.4
Inhalation of substance	69	11.6	40.6	14.5	7.2	8.7	4.3
Inhalation in open or nonconfined space	15	20.0	26.7	–	–	26.7	–
Injections, stings, venomous bites	10	–	–	40.0	–	–	–
Oxygen deficiency	111	13.5	33.3	25.2	9.0	4.5	3.6
Drowning, submersion	89	11.2	32.6	25.8	7.9	5.6	4.5
Depletion of oxygen from cave-in or collapsed materials	4	–	75.0	–	–	–	–
Fires and explosions	201	21.9	24.9	27.9	6.5	7.0	5.5
Fires--unintended or uncontrolled	88	14.8	25.0	31.8	4.5	8.0	9.1
Fire in residence, building, or other structure	49	20.4	18.4	28.6	–	10.2	12.2
Forest, brush, or other outdoor fire	4	–	–	100.0	–	–	–
Explosion	111	27.9	24.3	25.2	8.1	6.3	2.7
Explosion of pressure vessel or piping	39	20.5	25.6	30.8	15.4	7.7	–
Other events or exposures[3]	39	23.1	30.8	7.7	15.4	–	–

[1] *Based on the 1992* BLS Occupational Injury and Illness Classification Structures.
[2] There were 428 cases for which time of incident was not reported.
[3] Includes the category "Bodily reaction and exertion."

NOTE: Totals for major categories may include subcategories not shown separately. Percentages may not add to totals because of rounding.

Dashes indicate no data reported or data that do not meet publication criteria.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1993.

Table A-14. Fatal occupational injuries by event or exposure and month of incident, 1993

Event or exposure[1]	Total fatalities (number)	Month of incident (percent)											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Total	6,271	7.4	7.0	8.9	8.1	8.6	8.6	9.3	9.4	9.0	8.3	8.2	7.1
Transportation incidents	2,482	6.5	6.5	9.1	8.4	9.4	8.9	9.8	9.6	9.8	7.5	7.6	6.8
Highway	1,232	7.2	6.8	9.3	7.4	8.8	8.2	10.6	10.5	10.3	7.1	7.5	6.2
Collision between vehicles, mobile equipment	652	6.1	6.6	9.8	9.4	8.1	7.8	9.7	12.7	9.0	7.1	7.5	6.1
Re-entrant collision	13	–	–	–	–	–	23.1	23.1	–	23.1	–	–	–
Moving in same direction	99	6.1	4.0	8.1	10.1	9.1	8.1	9.1	12.1	10.1	6.1	10.1	7.1
Moving in opposite directions, oncoming	244	5.7	8.6	13.5	9.8	9.8	6.1	8.6	11.9	8.6	6.1	6.1	4.9
Moving in intersection	120	9.2	5.0	9.2	7.5	10.0	5.8	9.2	14.2	8.3	8.3	10.0	3.3
Moving and standing vehicle, mobile equipment-in roadway	30	13.3	–	–	10.0	10.0	–	13.3	10.0	–	10.0	–	–
Moving and standing vehicle, mobile equipment-side of road	22	–	–	–	–	–	18.2	–	22.7	–	–	–	18.2
Vehicle struck stationary object or equipment in roadway	29	–	10.3	10.3	–	20.7	–	27.6	13.8	–	–	–	–
Vehicle struck stationary object or equipment on side of road	159	10.1	9.4	8.8	4.4	9.4	8.2	9.4	5.7	11.3	6.9	10.1	6.3
Noncollision	333	7.8	5.4	9.0	5.7	8.7	10.2	12.0	8.7	12.3	6.9	6.6	6.6
Jack-knifed or overturned--no collision	235	6.0	6.8	8.9	5.5	7.7	11.5	11.9	9.8	10.6	7.2	7.2	6.8
Ran off highway--no collision	57	10.5	–	7.0	5.3	17.5	5.3	14.0	–	15.8	8.8	5.3	7.0
Nonhighway (farm, industrial premises)	392	3.8	6.9	5.4	7.4	11.7	11.2	9.7	11.0	12.2	7.9	8.4	4.3
Collision between vehicles or mobile equipment	13	–	–	–	–	–	–	–	23.1	–	–	30.8	–
Vehicle, mobile equipment struck stationary object	22	–	22.7	–	13.6	–	–	–	–	22.7	–	–	–
Noncollision accident	342	4.4	5.8	5.0	7.3	12.3	12.3	9.6	10.8	11.1	9.1	7.9	4.4
Fall from moving vehicle, mobile equipment	18	–	–	–	–	–	22.2	–	–	–	–	16.7	–
Fell from and struck by vehicle, mobile equipment	87	4.6	5.7	6.9	5.7	13.8	11.5	8.0	10.3	12.6	10.3	6.9	3.4
Overturned	212	4.2	5.2	4.2	8.5	11.8	12.3	11.3	11.3	10.8	8.5	7.1	4.7
Aircraft	280	6.1	7.9	10.7	15.0	10.0	9.6	9.6	7.5	6.4	5.4	3.9	7.9
Worker struck by vehicle, mobile equipment	361	5.5	4.7	7.8	8.9	8.6	10.5	9.1	8.9	6.6	11.1	8.0	10.0
Worker struck by vehicle, mobile equipment in roadway	126	4.0	6.3	7.1	5.6	10.3	9.5	4.8	10.3	6.3	10.3	11.1	13.5
Worker struck by vehicle, mobile equipment on side of road	54	7.4	5.6	9.3	7.4	9.3	9.3	22.2	7.4	–	11.1	5.6	–
Worker struck by vehicle, mobile equipment in parking lot or non-road area	150	6.0	4.0	6.7	10.7	7.3	12.7	8.7	8.7	8.0	10.7	7.3	9.3
Water vehicle	119	9.2	2.5	23.5	10.1	12.6	5.0	6.7	–	10.1	–	6.7	9.2
Fall from ship or boat, n.e.c.	44	11.4	–	9.1	18.2	22.7	–	13.6	–	–	–	–	–
Sinking, capsized water vehicle	53	11.3	–	37.7	5.7	9.4	–	–	–	9.4	–	9.4	9.4
Railway	85	8.2	9.4	7.1	–	4.7	–	4.7	11.8	14.1	11.8	16.5	8.2
Collision between railway vehicles	7	–	–	–	–	–	–	–	–	–	–	71.4	–
Collision between railway vehicle and other vehicle	63	11.1	9.5	9.5	–	6.3	–	6.3	11.1	9.5	11.1	11.1	9.5
Derailment	6	–	–	–	–	–	–	–	–	66.7	–	–	–
Assaults and violent acts	1,309	9.9	8.4	9.0	8.7	8.5	7.4	8.8	7.8	7.7	8.0	7.8	8.0
Homicides	1,063	10.3	8.6	8.8	8.0	9.0	7.1	9.0	7.3	7.6	8.4	7.8	8.0
Shooting	874	11.0	8.5	8.6	7.7	8.8	6.6	9.2	7.6	7.9	8.2	7.7	8.4
Stabbing	95	8.4	7.4	8.4	8.4	7.4	7.4	10.5	6.3	8.4	8.4	12.6	6.3
Self-inflicted injury	215	7.0	8.4	11.2	12.1	5.6	7.9	5.6	9.3	8.8	7.0	8.8	8.4
Assaults by animals	31	12.9	–	–	9.7	9.7	16.1	22.6	12.9	–	–	–	–
Contact with objects and equipment	1,039	8.2	7.7	8.9	6.8	7.8	8.7	7.9	8.4	8.5	10.4	10.5	6.4
Struck by object	563	6.9	6.9	8.5	6.9	6.7	8.3	8.3	10.1	9.8	10.3	10.7	6.4
Struck by falling object	345	7.8	8.1	7.5	6.7	5.5	8.4	7.8	9.6	9.3	9.3	11.9	8.1
Struck by flying object	81	6.2	–	9.9	6.2	7.4	12.3	11.1	3.7	12.3	14.8	7.4	6.2
Struck by swinging or slipping object	33	9.1	–	15.2	12.1	–	12.1	–	12.1	9.1	–	12.1	–
Struck by rolling, sliding objects on floor or ground level	62	–	8.1	8.1	4.8	6.5	4.8	12.9	14.5	11.3	11.3	11.3	–
Caught in or compressed by equipment or objects	308	9.1	9.4	9.1	4.9	9.7	8.8	7.1	4.9	7.1	12.0	10.1	7.8
Caught in running equipment or machinery	150	10.7	8.0	8.7	3.3	10.0	8.0	4.7	6.0	7.3	14.7	10.0	8.7
Compressed or pinched by rolling, sliding, or shifting objects	56	8.9	8.9	8.9	10.7	7.1	7.1	12.5	–	5.4	5.4	16.1	7.1
Caught in or crushed in collapsing materials	138	11.6	5.8	8.7	10.1	5.8	11.6	7.2	10.1	7.2	5.8	11.6	4.3
Excavation or trenching cave-in	38	–	–	10.5	10.5	–	21.1	7.9	–	13.2	7.9	10.5	–
Other cave-in	23	21.7	–	–	–	–	17.4	–	17.4	–	–	–	–
Caught in or crushed in collapsing structure	27	–	11.1	–	–	11.1	–	11.1	–	11.1	–	25.9	–
Falls	611	5.9	5.9	9.5	7.5	8.2	8.0	9.3	7.9	11.3	8.8	8.8	8.3
Fall to lower level	530	5.5	5.3	10.2	6.6	7.5	7.5	10.6	8.1	11.5	9.2	8.7	8.7
Fall down stairs or steps	23	–	–	–	–	–	–	–	–	–	17.4	13.0	–
Fall from floor, dock, or ground level	38	–	13.2	7.9	13.2	–	15.8	7.9	7.9	7.9	–	–	10.5
Fall from ladder	75	12.0	6.7	6.7	–	5.3	10.7	8.0	6.7	14.7	9.3	12.0	5.3
Fall from roof	120	6.7	5.8	11.7	9.2	11.7	5.0	11.7	6.7	9.2	9.2	8.3	5.0
Fall from scaffold, staging	71	–	–	12.7	5.6	4.2	11.3	14.1	9.9	12.7	8.5	9.9	7.0
Fall from building girders or other structural steel	40	–	–	12.5	10.0	7.5	–	10.0	15.0	10.0	–	10.0	7.5
Fall from nonmoving vehicle	32	–	–	–	–	–	–	12.5	–	12.5	–	9.4	25.0
Fall on same level	46	13.0	13.0	6.5	15.2	10.9	8.7	–	8.7	6.5	–	8.7	–
Exposure to harmful substances or environments	590	5.3	4.7	6.4	8.5	8.3	10.3	12.4	14.1	9.2	8.3	6.8	5.6
Contact with electric current	324	4.6	4.3	5.6	8.6	6.8	9.6	13.0	15.4	12.3	10.5	5.9	3.4
Contact with electric current of machine, tool, appliance, light fixture	44	–	–	6.8	9.1	–	11.4	20.5	22.7	6.8	–	6.8	–

See footnotes at end of table.

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Table A-14. Fatal occupational injuries by event or exposure and month of incident, 1993 — Continued

Event or exposure[1]	Total fatalities (number)	Month of incident (percent)											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Contact with wiring, transformers, or other electrical component	99	5.1	5.1	4.0	10.1	7.1	7.1	14.1	19.2	10.1	8.1	6.1	4.0
Contact with overhead power lines	115	5.2	4.3	7.0	8.7	8.7	7.8	9.6	11.3	12.2	14.8	6.1	4.3
Struck by lightning	16	–	–	–	–	–	43.8	25.0	–	–	–	–	–
Contact with temperature extremes	38	–	–	–	10.5	10.5	10.5	15.8	28.9	–	–	–	7.9
Exposure to environmental heat	22	–	–	–	–	13.6	13.6	22.7	40.9	–	–	–	–
Contact with hot objects or substances	11	–	–	–	–	–	–	–	–	–	–	–	27.3
Exposure to caustic, noxious, or allergenic substances	116	9.5	8.6	10.3	7.8	7.8	10.3	6.0	6.0	7.8	6.9	9.5	9.5
Inhalation of substance	69	11.6	8.7	13.0	5.8	–	11.6	–	4.3	8.7	5.8	14.5	10.1
Inhalation in open or nonconfined space	15	20.0	–	–	–	–	20.0	–	–	–	–	–	–
Ingestion of substance	13	–	–	–	–	30.8	–	–	–	–	–	–	–
Oxygen deficiency	111	4.5	2.7	5.4	8.1	12.6	12.6	16.2	13.5	2.7	6.3	8.1	7.2
Drowning, submersion	89	4.5	3.4	5.6	6.7	14.6	13.5	18.0	13.5	–	5.6	6.7	5.6
Fires and explosions	201	9.5	7.5	10.9	7.0	5.5	9.5	6.5	13.4	4.5	9.0	7.0	10.0
Fires--unintended or uncontrolled	88	9.1	5.7	10.2	11.4	–	11.4	3.4	17.0	3.4	13.6	3.4	9.1
Fire in residence, building, or other structure	49	10.2	–	12.2	10.2	–	12.2	–	22.4	–	14.3	–	8.2
Explosion	111	9.9	9.0	10.8	3.6	8.1	8.1	9.0	9.9	5.4	5.4	9.9	10.8
Explosion of pressure vessel or piping	39	–	–	12.8	7.7	7.7	12.8	10.3	17.9	7.7	–	–	10.3
Other events or exposures[2]	39	7.7	15.4	–	7.7	7.7	7.7	–	10.3	10.3	10.3	10.3	–

[1] Based on the 1992 BLS Occupational Injury and Illness Classification Structures.

[2] Includes the category "Bodily reaction and exertion."

NOTE: Totals for major categories may include subcategories not shown separately. Percentages may not add to totals because of rounding. Dashes indicate no data reported or data that do not meet publication criteria.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1993.

Table A-15. Fatal occupational injuries to self-employed workers[1] by occupation and event or exposure, 1992-93

Occupation[2]	Total fatalities (number)	Event or exposure[3] (percent)					
		Transportation incidents	Assaults and violent acts	Contact with objects and equipment	Falls	Exposure to harmful substances or environments	Fires and explosions
Total self-employed workers, 1992 and 1993	2,532	36.1	27.5	18.7	7.6	7.4	2.1
Managerial and professional specialty	430	27.2	42.6	10.7	10.0	7.4	1.2
Executive, administrative, and managerial	356	22.8	45.8	12.1	10.1	7.0	1.4
Managers, food serving and lodging establishments	82	15.9	73.2	–	–	7.3	–
Managers, properties and real estate	18	–	50.0	–	–	–	–
Managers, service organizations, n.e.c.	6	–	66.7	–	–	–	–
Managers and administrators, n.e.c.	212	25.0	35.8	15.1	14.2	7.1	1.9
Management related occupations	20	30.0	40.0	20.0	–	–	–
Accountants and auditors	5	–	80.0	–	–	–	–
Professional specialty	74	48.6	27.0	–	9.5	9.5	–
Engineers, architects, and surveyors	8	50.0	–	–	–	–	–
Health diagnosing occupations	16	43.8	43.8	–	–	–	–
Teachers, except postsecondary	12	83.3	–	–	–	–	–
Lawyers and judges	10	40.0	60.0	–	–	–	–
Lawyers	10	40.0	60.0	–	–	–	–
Writers, artists, entertainers, and athletes	18	44.4	–	–	–	27.8	–
Photographers	4	100.0	–	–	–	–	–
Athletes	9	44.4	–	–	–	44.4	–
Technical, sales, and administrative support	433	19.9	74.4	1.8	1.4	1.6	–
Technicians and related support occupations	36	88.9	–	–	–	–	–
Technicians, except health, engineering, and science	32	93.8	–	–	–	–	–
Airplane pilots and navigators	30	100.0	–	–	–	–	–
Sales occupations	389	13.1	81.5	1.8	1.3	1.5	–
Supervisors and proprietors, sales occupations	320	7.8	87.5	1.9	–	1.2	–
Sales representatives, finance and business services	19	26.3	68.4	–	–	–	–
Real estate sales occupations	8	–	75.0	–	–	–	–
Sales workers, retail and personal services	46	39.1	52.2	–	–	–	–
Sales workers, motor vehicles and boats	7	–	85.7	–	–	–	–
Cashiers	6	–	100.0	–	–	–	–
News vendors	10	90.0	–	–	–	–	–
Administrative support occupations, including clerical	8	–	62.5	–	–	–	–
Service occupations	48	39.6	43.8	–	12.5	–	–
Service occupations, except protective and household	44	36.4	45.5	–	13.6	–	–
Food preparation and service occupations	12	–	66.7	–	–	–	–
Cleaning and building service occupations, except household	12	41.7	–	–	41.7	–	–
Janitors and cleaners	6	–	–	–	66.7	–	–
Personal service occupations	20	50.0	50.0	–	–	–	–
Guides	7	100.0	–	–	–	–	–
Farming, forestry, and fishing	1,021	49.9	4.3	31.9	4.6	7.3	1.4
Farming operators and managers	678	52.9	4.1	30.8	3.8	5.6	1.9
Farmers, except horticultural	540	53.7	3.9	30.4	4.3	5.7	1.3
Horticultural specialty farmers	9	55.6	–	44.4	–	–	–
Managers, farms, except horticultural	114	50.0	3.5	34.2	–	3.5	5.3
Managers, horticultural specialty farms	15	46.7	–	–	–	–	–
Other agricultural and related occupations	191	42.9	7.9	28.8	7.9	11.5	–
Farm occupations, except managerial	158	49.4	8.2	30.4	–	9.5	–
Supervisors, farm workers	55	43.6	18.2	30.9	–	–	–
Farm workers	103	52.4	–	30.1	–	11.7	–
Related agricultural occupations	33	12.1	–	21.2	39.4	21.2	–
Groundskeepers and gardeners, except farm	28	–	–	21.4	42.9	25.0	–
Forestry and logging occupations	88	22.7	–	67.0	6.8	–	–
Supervisors, forestry, and logging workers	15	26.7	–	73.3	–	–	–
Timber cutting and logging occupations	70	22.9	–	68.6	5.7	–	–
Fishers, hunters, and trappers	64	75.0	–	–	–	20.3	–
Fishers	47	68.1	–	–	–	25.5	–
Precision production, craft, and repair	288	15.3	20.5	12.8	25.3	20.1	5.6
Mechanics and repairers	90	11.1	34.4	24.4	5.6	14.4	10.0
Vehicle and mobile equipment mechanics, repairers, and supervisors	60	6.7	40.0	28.3	–	13.3	10.0
Automobile mechanics and aprentices	29	–	41.4	24.1	–	17.2	–
Automobile body and related repairers	8	–	62.5	–	–	–	–
Miscellaneous mechanics and repairers	15	–	40.0	26.7	–	–	–
Construction trades	164	18.3	7.3	7.3	40.9	23.2	2.4
Supervisors, construction occupations	48	25.0	10.4	–	29.2	27.1	–
Supervisors, carpenters and related workers	9	–	–	–	44.4	–	–
Supervisors, n.e.c.	29	31.0	–	–	27.6	20.7	–
Construction trades, except supervisors	116	15.5	6.0	7.8	45.7	21.6	3.4
Carpenters and apprentices	33	12.1	–	–	60.6	12.1	–
Electricians and apprentices	18	–	–	–	–	55.6	–
Painters, construction and maintenance	19	–	–	–	57.9	21.1	–

See footnotes at end of table.

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Table A-15. Fatal occupational injuries to self-employed workers[1] by occupation and event or exposure, 1992-93 — Continued

Occupation[2]	Total fatalities (number)	Event or exposure[3] (percent)					
		Transportation incidents	Assaults and violent acts	Contact with objects and equipment	Falls	Exposure to harmful substances or environments	Fires and explosions
Plumbers, pipefitters, steamfitters, and apprentices	9	44.4	–	–	–	–	–
Roofers	14	–	–	–	85.7	–	–
Precision production occupations	24	–	62.5	–	–	16.7	–
Operators, fabricators, and laborers	300	46.3	22.0	17.7	5.3	3.7	4.7
Machine operators, assemblers, and inspectors	25	–	32.0	16.0	–	–	28.0
Fabricators, assemblers, and hand working occupations	13	–	–	–	–	–	38.5
Welders and cutters	10	–	–	–	–	–	50.0
Transportation and material moving occupations	236	55.1	22.9	15.7	2.5	2.1	–
Motor vehicle operators	204	55.9	26.0	13.2	–	2.5	–
Truck drivers	147	70.1	6.8	16.3	–	3.4	–
Driver-sales workers	8	62.5	–	–	–	–	–
Taxicab drivers and chauffeurs	46	8.7	89.1	–	–	–	–
Material moving equipment operators	30	50.0	–	30.0	–	–	–
Industrial truck and tractor equipment operators	6	66.7	–	–	–	–	–
Handlers, equipment cleaners, helpers, and laborers	39	15.4	10.3	30.8	17.9	15.4	10.3
Construction laborers	17	–	–	41.2	41.2	–	–
Laborers, except construction	14	35.7	–	–	–	–	–

[1] Includes paid and unpaid family workers, and may include owners of incorporated businesses, or members of partnerships.

[2] Based on the 1990 Occupational Classification System developed by the Bureau of the Census.

[3] Based on the 1992 BLS Occupational Injury and Illness Classification Structures. Includes other events and exposures, such as bodily reaction, in addition to those shown separately.

NOTE: Totals for major categories may include subcategories not shown separately. Percentages may not add to totals because of rounding.

Dashes indicate no data reported or data that do not meet publication criteria.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1992-1993.

Table A-16. Fatal occupational injuries to workers 19 years old and under by event and major industry, 1992-93

Event or exposure[1]	Industry[2]								
	Total	Agriculture, forestry and fishing	Mining	Construction	Manufacturing	Transportation and public utilities	Wholesale trade	Retail trade	Services
Total workers 19 years old and under, 1992 and 1993:									
Number	344	79	10	45	37	12	14	75	45
Percent	100	100	100	100	100	100	100	100	100
Transportation incidents	40	52	-	38	27	75	71	25	44
Highway	17	15	-	13	11	33	29	20	24
Collision between vehicles, mobile equipment	6	-	-	-	-	-	-	11	9
Moving in intersection	2	-	-	-	-	-	-	5	-
Noncollision	8	13	-	9	-	-	-	7	-
Jack-knifed or overturned—no collision	6	11	-	9	-	-	-	-	-
Nonhighway (farm, industrial premises)	12	28	-	9	-	-	-	-	9
Noncollision accident	12	28	-	9	-	-	-	-	-
Fell from and struck by vehicle, mobile equipment	3	10	-	-	-	-	-	-	-
Overturned	8	16	-	-	-	-	-	-	-
Worker struck by vehicle, mobile equipment	6	6	-	13	-	-	-	-	-
Assaults and violent acts	22	-	-	-	-	-	-	64	29
Homicides	19	-	-	-	-	-	-	63	27
Shooting	15	-	-	-	-	-	-	49	22
Stabbing	3	-	-	-	-	-	-	9	-
Contact with objects and equipment	18	29	40	13	46	-	-	5	-
Struck by object	8	11	-	-	19	-	-	-	-
Struck by falling object	4	5	-	-	14	-	-	-	-
Caught in or compressed by equipment or objects	5	10	-	-	16	-	-	-	-
Caught in running equipment or machinery	4	6	-	-	14	-	-	-	-
Falls	5	-	-	11	-	-	-	-	-
Fall to lower level	4	-	-	11	-	-	-	-	-
Fall from roof	1	-	-	9	-	-	-	-	-
Exposure to harmful substances or environments	12	9	-	31	14	-	-	-	16
Contact with electric current	8	8	-	22	-	-	-	-	9
Contact with electric current of machine, tool, appliance, light fixture	2	-	-	9	-	-	-	-	-
Contact with overhead power lines	3	-	-	9	-	-	-	-	-

[1] Based on the 1992 BLS Occupational Injury and Illness Classification Structures. Includes other events and exposures, such as bodily reaction, in addition to those shown separately.

[2] *Standard Industrial Classification Manual*, 1987 Edition.

NOTE: Totals for major categories may include subcategories not shown separately. Percentages may not add to totals because of rounding. Dashes indicate no data reported or data that do not meet publication criteria.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1992-1993.

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Table A-17. Fatal occupational injuries to women by occupation and event or exposure, 1992-93

Occupation[1]	Total fatalities (number)	Event or exposure[2] (percent)					
		Transportation incidents	Assaults and violent acts	Contact with objects and equipment	Falls	Exposure to harmful substances or environments	Fires and explosions
Total women, 1992 and 1993	924	38.7	43.2	5.0	5.1	4.9	1.7
Managerial and professional specialty	212	42.5	39.2	-	8.0	5.7	-
Executive, administrative, and managerial	110	31.8	50.9	-	6.4	4.5	-
Administrators and officials, public administration	8	75.0	-	-	-	-	-
Managers, food serving and lodging establishments	37	-	86.5	-	-	-	-
Managers and administrators, n.e.c.	26	34.6	38.5	-	-	-	-
Management related occupations	12	50.0	33.3	-	-	-	-
Professional specialty	102	53.9	26.5	-	9.8	6.9	-
Health assessment and treating occupations	36	55.6	13.9	-	16.7	-	-
Registered nurses	27	59.3	-	-	14.8	-	-
Teachers, except postsecondary	17	29.4	47.1	-	-	-	-
Teachers, elementary school	7	-	57.1	-	-	-	-
Social, recreation, and religious workers	14	57.1	28.6	-	-	-	-
Social workers	11	54.5	36.4	-	-	-	-
Writers, artists, entertainers, and athletes	13	84.6	-	-	-	-	-
Technical, sales, and administrative support	309	31.1	59.9	2.3	3.2	2.3	-
Technicians and related support occupations	20	50.0	20.0	-	-	-	-
Health technologists and technicians	12	50.0	-	-	-	-	-
Sales occupations	187	24.6	70.6	-	-	-	-
Supervisors and proprietors, sales occupations	61	21.3	73.8	-	-	-	-
Sales representatives, finance and business services	20	45.0	55.0	-	-	-	-
Real estate sales occupations	11	-	81.8	-	-	-	-
Sales workers, retail and personal services	101	19.8	74.3	-	-	-	-
Sales counter clerks	17	-	88.2	-	-	-	-
Cashiers	48	-	89.6	-	-	-	-
News vendors	13	76.9	-	-	-	-	-
Administrative support occupations, including clerical	102	39.2	48.0	-	4.9	-	-
Secretaries, stenographers, and typists	30	30.0	60.0	-	-	-	-
Secretaries	29	31.0	58.6	-	-	-	-
Financial records processing occupations	12	33.3	58.3	-	-	-	-
Bookkeepers, accounting, and auditing clerks	9	-	66.7	-	-	-	-
Mail and message distributing occupations	9	88.9	-	-	-	-	-
Miscellaneous administrative support	23	30.4	60.9	-	-	-	-
General office clerks	15	-	73.3	-	-	-	-
Service occupations	169	32.0	51.5	2.4	4.1	4.7	2.4
Private household occupations	10	50.0	-	-	-	-	-
Protective service occupations	30	56.7	36.7	-	-	-	-
Police and detectives, including supervisors	13	61.5	38.5	-	-	-	-
Police and detectives, public services	7	57.1	-	-	-	-	-
Guards	13	53.8	46.2	-	-	-	-
Service occupations, except protective and household	129	24.8	56.6	3.1	4.7	5.4	-
Food preparation and service occupations	51	11.8	74.5	-	-	-	-
Bartenders	7	-	85.7	-	-	-	-
Waiters and waitresses	16	-	68.8	-	-	-	-
Health service occupations	25	48.0	28.0	-	-	-	-
Nursing aides, orderlies, and attendants	20	55.0	25.0	-	-	-	-
Cleaning and building service occupations, except household	21	19.0	52.4	-	19.0	-	-
Janitors and cleaners	14	-	50.0	-	-	-	-
Personal service occupations	32	31.2	53.1	-	-	-	-
Hairdressers and cosmetologists	9	-	88.9	-	-	-	-
Farming, forestry, and fishing	40	52.5	20.0	12.5	-	12.5	-
Farming operators and managers	14	64.3	-	-	-	-	-
Farmers, except horticultural	11	63.6	-	-	-	-	-
Other agricultural and related occupations	22	36.4	27.3	-	-	22.7	-
Farm occupations, except managerial	17	41.2	23.5	-	-	-	-
Farm workers	14	50.0	-	-	-	-	-
Precision production, craft, and repair	22	31.8	18.2	-	-	27.3	-
Construction trades	8	-	-	-	-	50.0	-
Construction trades, except supervisors	8	-	-	-	-	50.0	-
Operators, fabricators, and laborers	150	52.0	18.0	14.7	6.0	4.7	4.7
Machine operators, assemblers, and inspectors	34	11.8	26.5	26.5	11.8	-	17.6
Machine operators, assorted materials	13	-	-	30.8	-	-	-
Transportation and material moving occupations	74	78.4	9.5	5.4	-	-	-
Motor vehicle operators	65	84.6	10.8	-	-	-	-
Truck drivers	40	92.5	-	-	-	-	-
Driver-sales workers	7	85.7	-	-	-	-	-
Bus drivers	9	100.0	-	-	-	-	-
Taxicab drivers and chauffeurs	9	-	66.7	-	-	-	-
Handlers, equipment cleaners, helpers, and laborers	42	38.1	26.2	21.4	-	-	-
Construction laborers	10	70.0	-	-	-	-	-
Freight, stock, and material handlers	12	-	41.7	-	-	-	-
Stock handlers and baggers	7	-	71.4	-	-	-	-
Laborers, except construction	13	38.5	-	-	-	-	-

[1] Based on the 1990 Occupational Classification System developed by the Bureau of the Census.

[2] Based on the 1992 BLS Occupational Injury and Illness Classification Structures. Includes other events and exposures, such as bodily reaction, in addition to those shown separately.

NOTE: Totals for major categories may include subcategories not shown separately. Percentages may not add to totals because of rounding.

Dashes indicate no data reported or data that do not meet publication criteria.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1992-1993.

Table A-18. Fatal occupational injuries to private sector wage and salary workers, government workers, and self-employed workers by industry, 1993

Industry[1]	Fatalities		Private sector wage and salary workers		Government workers		Self-employed workers[2]	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total	6,271	100.0	4,300	100.0	681	100.0	1,290	100.0
Agriculture, forestry and fishing	856	13.7	332	7.7	–	–	523	40.5
Agricultural production - crops	398	6.3	114	2.7	–	–	284	22.0
Cash grains	44	.7	9	.2	–	–	35	2.7
Field crops, except cash grains	21	.3	14	.3	–	–	7	.5
Sugarcane and sugar beets	8	.1	7	.2	–	–	–	–
Field crops, except grains, nec	7	.1	4	.1	–	–	–	–
Vegetables and melons	14	.2	11	.3	–	–	–	–
Fruits and tree nuts	23	.4	20	.5	–	–	–	–
Citrus fruits	5	.1	4	.1	–	–	–	–
Deciduous tree fruits	12	.2	11	.3	–	–	–	–
Horticultural specialties	8	.1	7	.2	–	–	–	–
Ornamental nursery products	7	.1	6	.1	–	–	–	–
General farms, primarily crop	184	2.9	34	.8	–	–	150	11.6
Agricultural production - livestock	209	3.3	58	1.3	–	–	151	11.7
Livestock, except dairy and poultry	60	1.0	23	.5	–	–	37	2.9
Beef cattle feedlots	10	.2	6	.1	–	–	4	.3
Beef cattle, except feedlots	24	.4	9	.2	–	–	15	1.2
Hogs	5	.1	–	–	–	–	4	.3
General livestock, nec	9	.1	–	–	–	–	8	.6
Dairy farms	72	1.1	13	.3	–	–	59	4.6
Poultry and eggs	5	.1	5	.1	–	–	–	–
Animal specialties	8	.1	5	.1	–	–	–	–
General farms, primarily animal	51	.8	7	.2	–	–	44	3.4
Agricultural services	153	2.4	107	2.5	–	–	46	3.6
Soil preparation services	4	.1	4	.1	–	–	–	–
Crop services	31	.5	22	.5	–	–	9	.7
Crop planting and protecting	17	.3	10	.2	–	–	7	.5
Animal services, except veterinary	7	.1	5	.1	–	–	–	–
Animal specialty services	6	.1	4	.1	–	–	–	–
Farm labor and management services	11	.2	11	.3	–	–	–	–
Farm management services	4	.1	4	.1	–	–	–	–
Landscape and horticultural services	92	1.5	62	1.4	–	–	30	2.3
Landscape counseling and planning	5	.1	–	–	–	–	4	.3
Lawn and garden services	17	.3	12	.3	–	–	5	.4
Ornamental shrub and tree services	53	.8	34	.8	–	–	19	1.5
Forestry	9	.1	6	.1	–	–	–	–
Fishing, hunting, and trapping	87	1.4	47	1.1	–	–	40	3.1
Commercial fishing	84	1.3	44	1.0	–	–	40	3.1
Finfish	31	.5	12	.3	–	–	19	1.5
Shellfish	42	.7	27	.6	–	–	15	1.2
Mining	174	2.8	162	3.8	–	–	12	.9
Metal mining	17	.3	16	.4	–	–	–	–
Copper ores	7	.1	7	.2	–	–	–	–
Gold and silver ores	5	.1	5	.1	–	–	–	–
Coal mining	40	.6	39	.9	–	–	–	–
Bituminous coal and lignite mining	39	.6	38	.9	–	–	–	–
Oil and gas extraction	94	1.5	84	2.0	–	–	10	.8
Crude petroleum and natural gas	14	.2	11	.3	–	–	–	–
Oil and gas field services	79	1.3	72	1.7	–	–	7	.5
Nonmetallic minerals, except fuels	23	.4	23	.5	–	–	–	–
Dimension stone	4	.1	4	.1	–	–	–	–
Crushed and broken stone	6	.1	6	.1	–	–	–	–
Sand and gravel	7	.1	7	.2	–	–	–	–
Chemical and fertilizer minerals	4	.1	4	.1	–	–	–	–
Construction	963	15.4	778	18.1	39	5.7	145	11.2
General building contractors	153	2.4	118	2.7	–	–	33	2.6
Residential building construction	63	1.0	42	1.0	–	–	20	1.6
Nonresidential building construction	70	1.1	63	1.5	–	–	6	.5
Heavy construction, except building	291	4.6	244	5.7	36	5.3	11	.9
Highway and street construction	106	1.7	70	1.6	34	5.0	–	–
Heavy construction, except highway	178	2.8	167	3.9	–	–	9	.7
Special trades contractors	519	8.3	416	9.7	–	–	101	7.8
Plumbing, heating and air-conditioning	46	.7	38	.9	–	–	8	.6
Painting and paper hanging	41	.7	31	.7	–	–	9	.7
Electrical work	68	1.1	53	1.2	–	–	14	1.1
Masonry, stonework, tile setting, and plastering	41	.7	33	.8	–	–	8	.6
Carpentry and floor work	38	.6	30	.7	–	–	8	.6
Roofing, siding, and sheet metal work	84	1.3	71	1.7	–	–	13	1.0
Concrete work	18	.3	16	.4	–	–	–	–
Water well drilling	10	.2	6	.1	–	–	4	.3
Miscellaneous special trade contractors	158	2.5	129	3.0	–	–	29	2.2
Structural steel erection	41	.7	39	.9	–	–	–	–
Excavation work	33	.5	21	.5	–	–	12	.9
Special trade contractors, n.e.c.	56	.9	44	1.0	–	–	12	.9
Manufacturing	762	12.2	696	16.2	–	–	66	5.1

See footnotes at end of table.

Table A-18. Fatal occupational injuries to private sector wage and salary workers, government workers, and self-employed workers by industry, 1993 — Continued

Industry[1]	Fatalities		Private sector wage and salary workers		Government workers		Self-employed workers[2]	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Food and kindred products	82	1.3	81	1.9	–	–	–	–
Meat products	19	.3	19	.4	–	–	–	–
Dairy products	6	.1	5	.1	–	–	–	–
Preserved fruits and vegetables	9	.1	9	.2	–	–	–	–
Grain mill products	11	.2	11	.3	–	–	–	–
Bakery products	8	.1	8	.2	–	–	–	–
Sugar and confectionery products	8	.1	8	.2	–	–	–	–
Fats and oils	5	.1	5	.1	–	–	–	–
Beverages	8	.1	8	.2	–	–	–	–
Miscellaneous food and kindred products	8	.1	8	.2	–	–	–	–
Textile mill products	19	.3	17	.4	–	–	–	–
Textile finishing, except wool	4	.1	4	.1	–	–	–	–
Apparel and other textile products	11	.2	9	.2	–	–	–	–
Lumber and wood products	204	3.3	164	3.8	–	–	40	3.1
Logging	147	2.3	114	2.7	–	–	33	2.6
Sawmills and planing mills	29	.5	26	.6	–	–	–	–
Millwork, plywood and structural members	12	.2	10	.2	–	–	–	–
Miscellaneous wood products	9	.1	7	.2	–	–	–	–
Furniture and fixtures	8	.1	8	.2	–	–	–	–
Paper and allied products	15	.2	15	.3	–	–	–	–
Paper mills	4	.1	4	.1	–	–	–	–
Paperboard containers and boxes	4	.1	4	.1	–	–	–	–
Printing and publishing	37	.6	34	.8	–	–	–	–
Newspapers	21	.3	18	.4	–	–	–	–
Commercial printing	9	.1	9	.2	–	–	–	–
Chemicals and allied products	32	.5	32	.7	–	–	–	–
Industrial inorganic chemicals	4	.1	4	.1	–	–	–	–
Plastics materials and synthetics	5	.1	5	.1	–	–	–	–
Drugs	4	.1	4	.1	–	–	–	–
Agricultural chemicals	4	.1	4	.1	–	–	–	–
Miscellaneous chemical products	7	.1	7	.2	–	–	–	–
Petroleum and coal products	17	.3	17	.4	–	–	–	–
Petroleum refining	15	.2	15	.3	–	–	–	–
Rubber and miscellaneous plastics products	29	.5	26	.6	–	–	–	–
Fabricated rubber products, nec	4	.1	4	.1	–	–	–	–
Miscellaneous plastics products, nec	23	.4	20	.5	–	–	–	–
Stone, clay, glass and concrete products	53	.8	50	1.2	–	–	–	–
Concrete, gypsum, and plaster products	37	.6	36	.8	–	–	–	–
Primary metal industries	71	1.1	71	1.7	–	–	–	–
Blast furnace and basic steel products	32	.5	32	.7	–	–	–	–
Iron and steel foundries	10	.2	10	.2	–	–	–	–
Primary nonferrous metals	5	.1	5	.1	–	–	–	–
Secondary nonferrous metals	5	.1	5	.1	–	–	–	–
Nonferrous rolling and drawing	6	.1	6	.1	–	–	–	–
Nonferrous foundries (castings)	9	.1	9	.2	–	–	–	–
Fabricated metal products	46	.7	42	1.0	–	–	4	.3
Metal cans and shipping containers	4	.1	4	.1	–	–	–	–
Fabricated structural metal products	19	.3	18	.4	–	–	–	–
Metal forgings and stampings	6	.1	6	.1	–	–	–	–
Metal services, nec	7	.1	5	.1	–	–	–	–
Miscellaneous fabricated metal products	4	.1	4	.1	–	–	–	–
Industrial machinery and equipment	44	.7	38	.9	–	–	6	.5
Construction and related machinery	9	.1	9	.2	–	–	–	–
Metalworking machinery	9	.1	9	.2	–	–	–	–
Industrial machinery, nec	8	.1	6	.1	–	–	–	–
Electronic and other electronic equipment	18	.3	18	.4	–	–	–	–
Electronics components and accessories	6	.1	6	.1	–	–	–	–
Miscellaneous electrical equipment and supplies	4	.1	4	.1	–	–	–	–
Transportation equipment	55	.9	54	1.3	–	–	–	–
Motor vehicles and equipment	16	.3	15	.3	–	–	–	–
Aircraft and parts	15	.2	15	.3	–	–	–	–
Ship and boat building and repairing	18	.3	18	.4	–	–	–	–
Instruments and related products	6	.1	5	.1	–	–	–	–
Miscellaneous manufacturing industries	15	.2	15	.3	–	–	–	–
Miscellaneous manufactures	11	.2	11	.3	–	–	–	–
Transportation and public utilities	961	15.3	800	18.6	71	10.4	90	7.0
Railroad transportation	44	.7	44	1.0	–	–	–	–
Railroads	44	.7	44	1.0	–	–	–	–
Local and interurban passenger transportation	146	2.3	102	2.4	16	2.3	28	2.2
Local and suburban transportation	27	.4	11	.3	16	2.3	–	–
Taxicabs	106	1.7	79	1.8	–	–	27	2.1
Bus charter service	4	.1	4	.1	–	–	–	–
Trucking and warehousing	470	7.5	415	9.7	–	–	53	4.1
Trucking and courier services, except air	428	6.8	375	8.7	–	–	51	4.0
Local trucking, without storage	109	1.7	91	2.1	–	–	17	1.3
Trucking, except local	212	3.4	194	4.5	–	–	17	1.3
Local trucking with storage	4	.1	4	.1	–	–	–	–
Courier services, except by air	14	.2	11	.3	–	–	–	–
Public warehousing and storage	19	.3	19	.4	–	–	–	–

See footnotes at end of table.

Table A-18. Fatal occupational injuries to private sector wage and salary workers, government workers, and self-employed workers by industry, 1993 — Continued

Industry[1]	Fatalities		Private sector wage and salary workers		Government workers		Self-employed workers[2]	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Trucking terminal facilities	8	.1	8	.2	-	-	-	-
U.S. Postal Service	15	.2	-	-	15	2.2	-	-
Water transportation	55	.9	49	1.1	4	.6	-	-
Deep sea foreign transportation of freight	5	.1	5	.1	-	-	-	-
Water transportation services	43	.7	38	.9	-	-	-	-
Transportation by air	79	1.3	76	1.8	-	-	-	-
Air transportation, scheduled	33	.5	33	.8	-	-	-	-
Air transportation, nonscheduled	27	.4	24	.6	-	-	-	-
Airports, flying fields, and services	19	.3	19	.4	-	-	-	-
Transportation services	22	.4	19	.4	-	-	-	-
Freight transportation arrangement	11	.2	11	.3	-	-	-	-
Miscellaneous transportation services	7	.1	5	.1	-	-	-	-
Communications	25	.4	25	.6	-	-	-	-
Telephone communications	14	.2	14	.3	-	-	-	-
Radio and television broadcasting	7	.1	7	.2	-	-	-	-
Electric, gas, and sanitary services	105	1.7	70	1.6	33	4.8	-	-
Electric services	33	.5	23	.5	10	1.5	-	-
Gas production and distribution	7	.1	7	.2	-	-	-	-
Combination utility services	13	.2	12	.3	-	-	-	-
Water supply	4	.1	-	-	4	.6	-	-
Sanitary services	42	.7	28	.7	13	1.9	-	-
Irrigation systems	6	.1	-	-	5	.7	-	-
Wholesale trade	252	4.0	225	5.2	-	-	25	1.9
Wholesale trade--durable goods	138	2.2	123	2.9	-	-	14	1.1
Motor vehicles, parts, and supplies	15	.2	14	.3	-	-	-	-
Lumber and construction materials	18	.3	18	.4	-	-	-	-
Professional and commercial equipment	13	.2	13	.3	-	-	-	-
Metals and minerals, except petroleum	9	.1	9	.2	-	-	-	-
Hardware, plumbing and heating equipment	10	.2	10	.2	-	-	-	-
Machinery, equipment, and supplies	30	.5	30	.7	-	-	-	-
Miscellaneous durable goods	35	.6	22	.5	-	-	12	.9
Wholesale trade--nondurable goods	114	1.8	102	2.4	-	-	11	.9
Groceries and related products	42	.7	34	.8	-	-	8	.6
Farm-product raw materials	18	.3	17	.4	-	-	-	-
Chemicals and allied products	5	.1	5	.1	-	-	-	-
Petroleum and petroleum products	13	.2	13	.3	-	-	-	-
Beer, wine, and distilled beverages	11	.2	10	.2	-	-	-	-
Miscellaneous nondurable goods	21	.3	20	.5	-	-	-	-
Retail trade	785	12.5	547	12.7	-	-	237	18.4
Building materials and garden supplies	32	.5	26	.6	-	-	6	.5
Lumber and other building materials	20	.3	17	.4	-	-	-	-
Mobile home dealers	5	.1	4	.1	-	-	-	-
General merchandise stores	26	.4	21	.5	-	-	5	.4
Department stores	14	.2	14	.3	-	-	-	-
Food stores	223	3.6	155	3.6	-	-	68	5.3
Grocery stores	199	3.2	139	3.2	-	-	60	4.7
Retail bakeries	11	.2	8	.2	-	-	-	-
Automotive dealers and service stations	138	2.2	115	2.7	-	-	23	1.8
New and used car dealers	30	.5	25	.6	-	-	5	.4
Used car dealers	7	.1	4	.1	-	-	-	-
Auto and home supply stores	22	.4	18	.4	-	-	4	.3
Gasoline service stations	68	1.1	57	1.3	-	-	11	.9
Apparel and accessory stores	23	.4	17	.4	-	-	6	.5
Family clothing stores	7	.1	6	.1	-	-	-	-
Shoe stores	5	.1	4	.1	-	-	-	-
Furniture and homefurnishings stores	25	.4	8	.2	-	-	17	1.3
Furniture and homefurnishings stores	10	.2	4	.1	-	-	6	.5
Household appliance stores	4	.1	-	-	-	-	4	.3
Radio, television, and computer stores	11	.2	4	.1	-	-	7	.5
Eating and drinking places	200	3.2	141	3.3	-	-	58	4.5
Eating places	113	1.8	85	2.0	-	-	28	2.2
Drinking places	39	.6	20	.5	-	-	19	1.5
Miscellaneous retail	118	1.9	64	1.5	-	-	54	4.2
Drug stores and proprietary stores	7	.1	7	.2	-	-	-	-
Liquor stores	23	.4	11	.3	-	-	12	.9
Used merchandise stores	15	.2	4	.1	-	-	11	.9
Miscellaneous shopping goods stores	23	.4	9	.2	-	-	14	1.1
Nonstore retailers	22	.4	12	.3	-	-	10	.8
Fuel dealers	10	.2	10	.2	-	-	-	-
Retail stores, nec	16	.3	9	.2	-	-	7	.5
Finance, insurance, and real estate	120	1.9	94	2.2	4	.6	22	1.7
Depository institutions	10	.2	10	.2	-	-	-	-
Commercial banks	7	.1	7	.2	-	-	-	-
Security and commodity brokers	8	.1	6	.1	-	-	-	-
Security brokers and dealers	6	.1	4	.1	-	-	-	-
Insurance carriers	15	.2	11	.3	-	-	-	-
Fire, marine, and casualty insurance	6	.1	5	.1	-	-	-	-
Insurance agents, brokers, and service	16	.3	12	.3	-	-	-	-

See footnotes at end of table.

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Table A-18. Fatal occupational injuries to private sector wage and salary workers, government workers, and self-employed workers by industry, 1993 — Continued

Industry[1]	Fatalities		Private sector wage and salary workers		Government workers		Self-employed workers[2]	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Real estate	65	1.0	49	1.1	–	–	15	1.2
Real estate operators and lessors	35	.6	29	.7	–	–	6	.5
Real estate agents and managers	26	.4	17	.4	–	–	8	.6
Holdings and other investment offices	5	.1	5	.1	–	–	–	–
Services	853	13.6	604	14.0	95	14.0	154	11.9
Hotels and other lodging places	34	.5	30	.7	–	–	–	–
Hotels and motels	25	.4	22	.5	–	–	–	–
Camps and recreational vehicle parks	8	.1	7	.2	–	–	–	–
Personal services	30	.5	17	.4	–	–	13	1.0
Laundry, cleaning, and garment services	12	.2	7	.2	–	–	5	.4
Beauty shops	9	.1	4	.1	–	–	5	.4
Business services	191	3.0	172	4.0	–	–	16	1.2
Advertising	13	.2	11	.3	–	–	–	–
Services to buildings	32	.5	26	.6	–	–	5	.4
Miscellaneous equipment rental and leasing	8	.1	8	.2	–	–	–	–
Personnel supply services	45	.7	44	1.0	–	–	–	–
Computer and data processing services	8	.1	6	.1	–	–	–	–
Miscellaneous business services	83	1.3	76	1.8	–	–	6	.5
Detective and armored car services	45	.7	43	1.0	–	–	–	–
Automotive repair, services, and parking	116	1.8	69	1.6	–	–	47	3.6
Automotive rentals, no drivers	8	.1	8	.2	–	–	–	–
Automotive repair shops	83	1.3	45	1.0	–	–	38	2.9
Automotive services, except repair	23	.4	14	.3	–	–	9	.7
Miscellaneous repair services	49	.8	28	.7	–	–	21	1.6
Electrical repair shops	11	.2	7	.2	–	–	4	.3
Miscellaneous repair shops	35	.6	20	.5	–	–	15	1.2
Motion pictures	23	.4	21	.5	–	–	–	–
Motion picture production and services	11	.2	11	.3	–	–	–	–
Video tape rental	10	.2	8	.2	–	–	–	–
Amusement and recreation services	85	1.4	59	1.4	8	1.2	18	1.4
Miscellaneous amusement, recreation services	77	1.2	55	1.3	7	1.0	15	1.2
Health services	81	1.3	60	1.4	16	2.3	5	.4
Offices and clinics of dentists	6	.1	4	.1	–	–	–	–
Nursing and personal care facilities	11	.2	9	.2	–	–	–	–
Hospitals	36	.6	26	.6	10	1.5	–	–
Home health care services	10	.2	8	.2	–	–	–	–
Health and allied services, nec	7	.1	5	.1	–	–	–	–
Legal services	14	.2	11	.3	–	–	–	–
Educational services	87	1.4	20	.5	59	8.7	8	.6
Elementary and secondary schools	48	.8	5	.1	41	6.0	–	–
Colleges and universities	19	.3	7	.2	12	1.8	–	–
Schools and educational services, nec	12	.2	6	.1	–	–	4	.3
Social services	35	.6	27	.6	7	1.0	–	–
Individual and family services	11	.2	6	.1	4	.6	–	–
Job training and related services	8	.1	8	.2	–	–	–	–
Residential care	10	.2	10	.2	–	–	–	–
Membership organizations	40	.6	37	.9	–	–	–	–
Business associations	7	.1	6	.1	–	–	–	–
Civic and social associations	6	.1	6	.1	–	–	–	–
Religious organizations	25	.4	23	.5	–	–	–	–
Engineering and management services	45	.7	35	.8	–	–	9	.7
Engineering and architectural services	22	.4	18	.4	–	–	–	–
Research and testing services	10	.2	9	.2	–	–	–	–
Management and public relations	7	.1	5	.1	–	–	–	–
Private households	14	.2	11	.3	–	–	–	–
Services, nec	6	.1	4	.1	–	–	–	–
Public administration	463	7.4	–	–	463	68.0	–	–
Executive, legislative, and general government	76	1.2	–	–	76	11.2	–	–
Executive offices	15	.2	–	–	15	2.2	–	–
Executive and legislative combined	30	.5	–	–	30	4.4	–	–
Justice, public order, and safety	172	2.7	–	–	172	25.3	–	–
Public order and safety	171	2.7	–	–	171	25.1	–	–
Police protection	116	1.8	–	–	116	17.0	–	–
Correctional institutions	15	.2	–	–	15	2.2	–	–
Fire protection	36	.6	–	–	36	5.3	–	–
Finance, taxation, and monetary policy	4	.1	–	–	4	.6	–	–
Administration of human resources	14	.2	–	–	14	2.1	–	–
Environmental quality and housing	25	.4	–	–	25	3.7	–	–
Administration of economic programs	38	.6	–	–	38	5.6	–	–
National security and international affairs	134	2.1	–	–	134	19.7	–	–
National security	132	2.1	–	–	132	19.4	–	–

[1] *Standard Industrial Classification Manual*, 1987 Edition.

[2] Includes paid and unpaid family workers, and may include owners of incorporated businesses, or members of partnerships.

NOTE: Totals for major categories may include subcategories not shown separately. Percentages may not add to totals because of rounding. There were 77 fatalities for which there was insufficient information to determine a specific industry.

Dashes indicate no data reported or data that do not meet publication criteria.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1993.

Table A-19. Fatal occupational injuries by part of body affected, 1993

Part of body[1]	Fatalities	
	Number	Percent
Total	6,271	100.0
Head	1,527	24.4
Trunk	1,368	21.8
Chest, including ribs, internal organs	638	10.2
Back, including spine, spinal cord	96	1.5
Abdomen	124	2.0
Pelvic region	29	.5
Multiple trunk locations	345	5.5
Neck, including throat	123	2.0
Lower extremities	49	.8
Upper extremities	17	.3
Body systems	1,077	17.2
Multiple body parts	2,009	32.0
Nonclassifiable	100	1.6

[1] Based on the 1992 BLS Occupational Injury and Illness Classification Structures. The part of body affected identifies the part affected by the nature of injury.

NOTE: Totals for major categories may include subcategories not shown separately. Percentages may not add to totals because of rounding.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1993.

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Appendix B. State and area data from the 1993 Census of Fatal Occupational Injuries

This appendix presents State and metropolitan area data from the 1993 Census of Fatal Occupational Injuries (CFOI).

Comparisons between States should be made with caution. The industrial and occupational mix in a State greatly determines the number of work fatalities that may occur, as well as the types of fatal events.

Year-to-year comparisons of State totals and rates also should be made with caution. Disasters such as explosions and aircraft crashes often result in multiple fatalities that sharply increase a State's total for a particular year. Such disasters can lead to unwarranted conclusions about safety conditions in a State's workplaces.

In addition, a State's fatality totals may increase slightly as the result of improved techniques for identifying and capturing occupational fatality information.

Two States—California and Texas—together accounted for one-sixth of the 6,271 fatal work injuries in 1993. In general, States with the highest employment totals reported greater numbers of work injury fatalities.

Transportation incidents accounted for half of the fatal work injuries in 11 States. The types of transportation incidents differed, however, among States. In most of the States, incidents that occurred on highways and other public roadways predominated. In States with large agricultural sectors, vehicle-related fatalities included tractor rollovers and other incidents occurring off public roadways. In Alaska, almost half of the transportation-related fatalities resulted from aircraft crashes.

Workplace homicide was the leading fatal event in nearly a third of the States.

State fatality data for major industry and occupation groups are shown in this appendix. More specific breakouts may be obtained from each State. (See appendix E for a list of State CFOI agencies and telephone numbers.)

The 19 Consolidated Metropolitan Statistical Areas (CMSAs)[1] together accounted for one-third of the total work-related fatalities in the United States. The two largest CMSAs—New York and Los Angeles—had the most work injury fatalities and together accounted for over one-tenth of the total nationwide. About half of the work fatalities in these two CMSAs were the result of assaults and violent acts, the leading fatal event in 12 of the 19 CMSAs.

Caution should also be taken when comparing metropolitan areas for the same reasons noted above.

[1] Metropolitan areas are core geographic areas containing a large population nucleus. Together with adjacent communities they have a high degree of economic and social integration. Metropolitan Areas (MAs) are defined by the Office of Management and Budget (OMB) in Bulletin 93-17, June 30, 1993. They refer to the entire set of areas known as Consolidated Metropolitan Statistical Areas (CMSAs), Primary Metropolitan Statistical Area (PMSAs) and Metropolitan Statistical Areas (MSAs). CMSAs consist of 2 or more PMSAs, have a population over 1 million, and meet certain other requirements specified by OMB. OMB has defined 19 CMSAs and 253 MSAs in the United States. MSAs are defined in terms of entire counties, except in the six New England States where they are defined in terms of cities and towns.

Table B-1. Fatal occupational injuries by State and event or exposure, 1993

State	Total fatalities (number)	Event or exposure[1] (percent)					
		Transportation incidents[2]	Assaults and violent acts[3]	Contact with objects and equipment	Falls	Exposure to harmful substances or environments	Fires and explosions
Total	6,271	40	21	17	10	9	3
Alabama	138	45	17	22	6	5	4
Alaska	66	71	18	6	–	–	–
Arizona	55	33	20	31	–	13	–
Arkansas	71	32	11	23	14	10	10
California	615	37	37	9	7	7	3
Colorado	99	43	23	14	11	5	–
Connecticut	31	32	32	10	16	10	–
Delaware	13	54	–	–	–	–	–
District of Columbia	25	–	76	–	12	–	–
Florida	345	40	19	11	12	15	1
Georgia	226	38	24	19	8	7	2
Hawaii	26	42	12	–	15	19	–
Idaho	43	51	7	28	7	–	–
Illinois	252	32	20	17	14	12	4
Indiana	136	47	12	15	7	10	9
Iowa	88	59	–	19	6	12	–
Kansas	99	55	9	19	4	9	4
Kentucky	143	47	13	22	6	8	3
Louisiana	171	50	15	11	12	9	4
Maine	20	45	–	15	–	30	–
Maryland	82	38	23	9	12	13	5
Massachusetts	82	37	22	12	23	6	–
Michigan	160	38	24	19	5	13	–
Minnesota	113	47	12	17	7	8	5
Mississippi	121	47	20	15	11	4	3
Missouri	131	41	15	20	8	14	3
Montana	38	55	–	21	8	13	–
Nebraska	78	50	6	26	5	9	–
Nevada	38	45	16	16	11	8	–
New Hampshire	13	38	–	23	–	–	–
New Jersey	142	39	18	11	20	9	3
New Mexico	55	56	13	20	–	5	–
New York (except N.Y.C.)	152	39	18	15	11	11	6
New York City	191	6	78	4	8	2	–
North Carolina	214	36	25	20	9	8	2
North Dakota	30	20	–	50	20	–	–
Ohio	190	39	12	21	15	9	2
Oklahoma	83	47	7	18	7	14	–
Oregon	84	45	10	24	13	6	–
Pennsylvania	241	29	22	24	10	12	3
Rhode Island	16	19	–	–	31	–	19
South Carolina	86	37	26	13	9	9	6
South Dakota	28	43	–	36	–	–	–
Tennessee	154	54	10	14	9	8	4
Texas	529	31	26	16	10	13	3
Utah	66	48	5	21	11	11	–
Vermont	7	43	–	–	–	–	–
Virginia	133	49	11	22	7	9	3
Washington	112	50	9	21	11	6	–
West Virginia	66	36	8	30	9	12	–
Wisconsin	138	38	12	25	7	9	8
Wyoming	36	44	11	19	14	–	–

[1] Based on the 1992 BLS Occupational Injury and Illness Classification Structures. Includes other events and exposures, such as bodily reaction, in addition to those shown separately.

[2] Includes highway, nonhighway, air, water, and rail fatalities.

[3] Includes violence by persons, self-inflicted injury, and assaults by animals.

NOTE: Percentages may not add to totals because of rounding.

Dashes indicate no data reported or data that do not meet publication criteria.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1993.

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Table B-2. Fatal occupational injuries resulting from transportation incidents and assaults and violent acts by State, 1993

State	Total fatalities (number)	Transportation incidents (percent)			Assaults and violent acts[1] (percent)			
		Total	Highway incidents	Non-highway incidents	Total	Homicides		Self-inflicted injuries
						Total homicides	Homicides by shooting	
Total	6,271	40	20	6	21	17	14	3
Alabama	138	45	22	7	17	14	13	2
Alaska	66	71	–	–	18	18	14	–
Arizona	55	33	20	–	20	16	16	–
Arkansas	71	32	24	4	11	7	6	–
California	615	37	20	4	37	32	26	6
Colorado	99	43	18	7	23	16	13	3
Connecticut	31	32	10	–	32	23	23	10
Delaware	13	54	–	–	–	–	–	–
District of Columbia	25	8	–	–	76	76	72	–
Florida	345	40	20	4	19	15	13	3
Georgia	226	38	19	3	24	19	14	6
Hawaii	26	42	–	12	12	–	–	–
Idaho	43	51	28	12	7	–	–	–
Illinois	252	32	12	11	20	15	13	5
Indiana	136	47	26	8	12	8	6	2
Iowa	88	59	28	9	–	–	–	–
Kansas	99	55	30	10	9	7	6	–
Kentucky	143	47	24	16	13	9	8	3
Louisiana	171	50	16	8	15	11	9	3
Maine	20	45	25	–	–	–	–	–
Maryland	82	38	12	5	23	15	11	7
Massachusetts	82	37	16	–	22	20	15	–
Michigan	160	38	21	6	24	16	11	8
Minnesota	113	47	22	4	12	7	5	4
Mississippi	121	47	41	–	20	16	14	4
Missouri	131	41	24	9	15	11	8	2
Montana	38	55	24	8	–	–	–	–
Nebraska	78	50	24	9	6	–	–	–
Nevada	38	45	29	–	16	13	11	–
New Hampshire	13	38	–	–	–	–	–	–
New Jersey	142	39	17	3	18	14	8	4
New Mexico	55	56	33	7	13	9	5	–
New York (except N.Y.C.)	152	39	17	8	18	13	7	5
New York City	191	6	3	–	78	73	61	5
North Carolina	214	36	22	5	25	21	17	4
North Dakota	30	20	13	–	–	–	–	–
Ohio	190	39	18	11	12	9	8	3
Oklahoma	83	47	29	4	7	6	6	–
Oregon	84	45	23	6	10	7	6	–
Pennsylvania	241	29	17	5	22	18	14	3
Rhode Island	16	19	–	–	–	–	–	–
South Carolina	86	37	24	7	26	24	16	–
South Dakota	28	43	18	–	–	–	–	–
Tennessee	154	54	23	23	10	9	8	–
Texas	529	31	15	5	26	21	19	4
Utah	66	48	32	5	5	–	–	–
Vermont	7	43	–	–	–	–	–	–
Virginia	133	49	23	7	11	8	8	–
Washington	112	50	18	5	9	6	4	–
West Virginia	66	36	21	6	8	8	6	–
Wisconsin	138	38	16	9	12	7	5	4
Wyoming	36	44	31	–	11	–	–	–

[1] Includes violence by persons, self-inflicted injury, and assaults by animals.

NOTE: Totals for major categories may include *subcategories not shown separately. Percentages may not* add to totals because of rounding.

Dashes indicate no data reported or data that do not meet publication criteria.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1993.

Table B-3. Fatal occupational injuries by State and major industry division, 1993

State	Total fatalities (number)	Private industry[1] (percent)									Government[2] (percent)
		Agriculture, forestry, and fishing	Mining	Construction	Manufacturing	Transportation and public utilities	Wholesale trade	Retail trade	Finance, insurance, and real estate	Services	Federal, State, and local
Total	6,271	14	3	15	12	14	4	13	2	12	11
Alabama	138	6	–	10	20	16	4	17	2	7	9
Alaska	66	36	–	–	17	17	–	–	–	15	9
Arizona	55	9	11	11	11	18	–	11	–	9	18
Arkansas	71	–	–	27	21	17	–	10	–	8	8
California	615	8	1	10	9	14	3	20	3	18	13
Colorado	99	16	8	10	7	10	4	13	–	20	10
Connecticut	31	–	–	–	16	16	–	32	–	10	10
Delaware	13	–	–	23	23	23	–	–	–	–	–
District of Columbia	25	–	–	–	–	–	–	40	–	20	24
Florida	345	14	–	19	6	14	2	12	3	21	9
Georgia	226	6	–	16	15	12	3	15	2	15	13
Hawaii	26	12	–	27	–	12	–	12	–	–	15
Idaho	43	21	–	19	23	9	–	–	–	12	7
Illinois	252	16	2	15	14	12	3	13	2	12	9
Indiana	136	12	–	14	17	19	7	10	–	10	11
Iowa	88	32	–	12	9	12	5	3	–	7	16
Kansas	99	36	8	10	3	14	–	5	–	6	13
Kentucky	143	21	12	9	8	16	6	7	–	7	13
Louisiana	171	9	5	25	15	17	5	5	2	10	6
Maine	20	35	–	–	–	20	–	–	–	20	–
Maryland	82	10	–	15	9	12	7	9	–	17	18
Massachusetts	82	13	–	22	11	11	7	7	–	13	13
Michigan	160	13	–	14	18	16	4	12	2	11	10
Minnesota	113	26	–	8	8	11	14	11	–	12	11
Mississippi	121	7	–	17	23	14	4	18	–	7	10
Missouri	131	27	–	12	10	11	4	14	3	10	8
Montana	38	32	8	13	18	11	–	–	–	–	8
Nebraska	78	40	–	5	12	17	–	–	–	13	9
Nevada	38	–	–	24	8	18	8	11	–	–	13
New Hampshire	13	–	–	–	–	–	–	–	–	38	31
New Jersey	142	4	–	22	9	18	2	12	4	12	18
New Mexico	55	11	20	11	–	24	–	9	–	9	7
New York (except N.Y.C.)	152	20	–	16	10	12	3	12	2	10	14
New York City	191	–	–	9	3	29	3	30	5	11	9
North Carolina	214	11	–	16	20	14	3	14	–	8	12
North Dakota	30	43	17	20	–	–	–	–	–	–	–
Ohio	190	8	2	15	24	12	4	8	2	13	10
Oklahoma	83	–	10	8	6	18	7	7	–	6	7
Oregon	84	14	–	14	23	14	–	10	–	7	13
Pennsylvania	241	10	3	20	15	13	3	17	1	13	5
Rhode Island	16	–	–	19	–	–	–	19	–	–	25
South Carolina	86	7	–	19	17	12	3	16	–	15	7
South Dakota	28	71	–	–	–	–	–	–	–	–	–
Tennessee	154	27	3	15	11	10	4	10	–	12	7
Texas	529	9	7	17	11	12	5	14	1	13	11
Utah	66	11	5	24	6	14	5	5	–	17	14
Vermont	7	–	–	–	–	–	–	–	–	–	–
Virginia	133	14	–	16	14	13	–	12	–	9	20
Washington	112	22	–	17	11	21	7	5	–	9	5
West Virginia	66	5	18	18	14	23	5	8	–	6	–
Wisconsin	138	27	–	10	16	9	6	10	–	4	15
Wyoming	36	14	19	17	–	14	11	–	–	8	–

[1] *Standard Industrial Classification Manual*, 1987 Edition.
[2] Includes fatalities to workers employed by governmental organizations regardless of industry.

NOTE: Percentages may not add to totals because of rounding. There were 77 fatalities for which there was insufficient information to determine a specific industry classification, though a distinction between private and government was made for each.

Dashes indicate no data reported or data that do not meet publication criteria.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1993.

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Table B-4. Fatal occupational injuries by State and major occupational group, 1993

Occupation[1]	Total fatalities (number)	Occupation (percent)						
		Managerial and professional specialty	Technical, sales, and administrative support	Service occupations	Farming, forestry, and fishing	Precision production, craft, and repair	Operators, fabricators, and laborers	Military occupations
Total	6,271	11	13	9	15	17	31	2
Alabama	138	8	17	4	9	8	40	4
Alaska	66	6	17	12	42	5	12	6
Arizona	55	7	15	13	9	16	40	–
Arkansas	71	6	10	7	11	24	41	–
California	615	14	19	12	9	17	23	5
Colorado	99	16	14	12	20	19	15	–
Connecticut	31	13	16	–	10	16	35	–
Delaware	13	–	–	–	–	–	46	–
District of Columbia	25	–	24	36	–	24	–	–
Florida	345	11	10	10	15	21	32	1
Georgia	226	15	18	7	8	14	34	3
Hawaii	26	–	–	12	12	12	42	12
Idaho	43	9	9	9	23	14	35	–
Illinois	252	11	12	14	15	18	28	–
Indiana	136	12	6	8	12	15	46	–
Iowa	88	14	7	7	31	9	33	–
Kansas	99	11	11	5	33	16	20	3
Kentucky	143	6	10	7	22	19	33	3
Louisiana	171	10	11	3	9	22	44	–
Maine	20	15	–	–	35	–	25	–
Maryland	82	20	15	6	10	23	20	7
Massachusetts	82	12	13	13	13	33	15	–
Michigan	160	15	11	8	16	16	34	–
Minnesota	113	9	12	8	25	7	34	5
Mississippi	121	8	20	11	11	12	37	–
Missouri	131	15	10	8	30	12	24	–
Montana	38	8	–	–	37	21	24	–
Nebraska	78	8	8	5	38	14	24	–
Nevada	38	11	16	13	–	18	32	–
New Hampshire	13	38	–	–	–	–	23	–
New Jersey	142	7	7	14	4	23	39	5
New Mexico	55	13	20	–	13	16	35	–
New York (except N.Y.C.)	152	9	11	10	22	18	29	–
New York City	191	12	28	9	–	8	42	–
North Carolina	214	9	13	8	18	16	32	4
North Dakota	30	–	–	–	43	20	23	–
Ohio	190	13	8	11	8	25	34	–
Oklahoma	83	6	10	4	10	19	46	–
Oregon	84	13	8	6	25	18	29	–
Pennsylvania	241	12	14	7	13	22	31	–
Rhode Island	16	–	19	–	–	25	25	–
South Carolina	86	9	16	7	15	20	31	–
South Dakota	28	–	–	–	64	–	18	–
Tennessee	154	13	16	3	26	15	25	–
Texas	529	8	15	9	9	21	35	1
Utah	66	14	12	9	11	29	26	–
Vermont	7	–	–	–	–	–	57	–
Virginia	133	10	14	8	17	17	26	8
Washington	112	7	18	3	25	17	29	–
West Virginia	66	9	–	6	11	24	45	–
Wisconsin	138	12	11	7	27	12	27	4
Wyoming	36	8	19	–	14	19	33	–

[1] Based on the 1990 Occupational Classification System developed by the Bureau of the Census.

NOTE: Percentages may not add to totals because of rounding. There were 73 fatalities for which there was insufficient information to determine and occupation classification.

Dashes indicate no data reported or data that do not meet publication criteria.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1993.

Table B-5. Fatal occupational injuries in selected metropolitan areas by event or exposure, 1993

Metropolitan area[1]	Total fatalities (number)	Event or exposure[2] (percent)					
		Transportation incidents	Assaults and violent acts	Contact with objects and equipment	Falls	Exposure to harmful substances or environments	Fires and explosions
Total U.S.[3]	6,271	40	21	17	10	9	3
New York-Northern New Jersey-Long Island, NY-NJ-CT-PA CMSA	364	20	51	7	13	6	3
Los Angeles-Riverside-Orange County, CA CMSA	279	27	48	6	8	6	4
Chicago-Gary-Kenosha, IL-IN-WI CMSA	153	20	27	19	15	14	5
Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD CMSA	127	30	35	9	15	11	–
Houston-Galveston-Brazoria, TX CMSA	124	15	41	12	10	17	5
Washington-Baltimore, DC-MD-VA-WV CMSA	122	34	36	8	10	10	2
San Francisco-Oakland-San Jose, CA CMSA	107	36	39	8	7	7	–
Dallas-Fort Worth, TX CMSA	103	25	34	17	12	11	–
Miami-Fort Lauderdale, FL CMSA	89	34	24	12	15	13	–
Atlanta, GA MSA	84	32	26	18	13	7	–
Detroit-Ann Arbor-Flint, MI CMSA	75	27	37	19	–	15	–
Boston-Worcester-Lawrence, MA-NH-ME-CT CMSA	60	28	27	12	27	7	–
San Diego, CA MSA	47	36	26	11	13	15	–
Tampa-St. Petersburg-Clearwater, FL MSA	44	32	30	7	11	16	–
Denver-Boulder-Greeley, CO CMSA	43	19	35	14	19	9	–
Milwaukee-Racine, WI CMSA	39	13	31	18	10	8	18
Seattle-Tacoma-Bremerton, WA CMSA	37	35	11	27	11	14	–
Cleveland-Akron, OH CMSA	33	36	–	27	15	9	–
Portland-Salem, OR-WA CMSA	33	36	21	21	18	–	–
St. Louis, MO-IL MSA	31	23	26	19	–	23	–
Cincinnati-Hamilton, OH-KY-IN CMSA	24	33	–	21	17	–	–
Sacramento-Yolo, CA CMSA	24	42	42	–	–	–	–

[1] Metropolitan areas used in this table are categorized into Metropolitan Statistical Areas (MSAs) and Consolidated Metropolitan Statistical Areas (CMSAs) and are based on definitions from the Office of Management and Budget Bulletin Number 93-17, June 30, 1993.

[2] Based on the 1992 BLS Occupational Injury and Illness Classification Structures. Total includes other events and exposures, such as bodily reaction, in addition to those shown separately.

[3] Also includes fatalities occurring in nonmetropolitan areas.

NOTE: Percentages may not add to totals because of rounding. Dashes indicate no data reported or data that do not meet publication criteria.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1993.

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Table B-6. Fatal occupational injuries in selected metropolitan areas by major industry division, 1993

Metropolitan area[1]	Total fatalities (number)	Industry[2] (percent)								
		Private industry								*Government*[3]
		Agriculture, forestry, and fishing	Construction	Manufacturing	Transportation and public utilities	Wholesale trade	Retail trade	Finance, insurance, and real estate	Services	Federal, State, and local
Total U.S.[4]	6,271	14	15	12	14	4	13	2	12	11
New York-Northern New Jersey-Long Island, NY-NJ-CT-PA CMSA	364	2	14	7	23	3	22	4	12	13
Los Angeles-Riverside-Orange County, CA CMSA	279	4	10	9	15	3	22	3	19	15
Chicago-Gary-Kenosha, IL-IN-WI CMSA	153	3	19	16	15	2	18	3	15	5
Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD CMSA	127	2	17	10	10	3	25	3	19	10
Houston-Galveston-Brazoria, TX CMSA	124	3	18	12	15	4	22	–	17	4
Washington-Baltimore, DC-MD-VA-WV CMSA	122	7	14	4	11	6	18	–	14	22
San Francisco-Oakland-San Jose, CA CMSA	107	7	11	11	11	–	23	4	21	10
Dallas-Fort Worth, TX CMSA	103	4	22	13	12	4	18	–	17	9
Miami-Fort Lauderdale, FL CMSA	89	7	22	8	15	–	17	3	18	9
Atlanta, GA MSA	84	–	21	13	13	–	15	–	19	8
Detroit-Ann Arbor-Flint, MI CMSA	75	–	15	15	16	–	16	–	17	13
Boston-Worcester-Lawrence, MA-NH-ME-CT CMSA	60	5	22	12	7	10	10	–	13	20
San Diego, CA MSA	47	–	11	9	9	–	9	9	30	23
Tampa-St. Petersburg-Clearwater, FL MSA	44	11	14	–	14	–	11	9	25	9
Denver-Boulder-Greeley, CO CMSA	43	12	12	7	12	–	19	–	23	7
Milwaukee-Racine, WI CMSA	39	–	18	13	8	–	15	–	10	23
Seattle-Tacoma-Bremerton, WA CMSA	37	–	22	11	14	14	8	–	16	8
Cleveland-Akron, OH CMSA	33	9	24	27	9	–	–	–	–	–
Portland-Salem, OR-WA CMSA	33	–	15	–	9	–	24	–	9	24
St. Louis, MO-IL MSA	31	10	16	–	10	–	16	–	19	13
Cincinnati-Hamilton, OH-KY-IN CMSA	24	–	12	33	17	–	–	–	25	–
Sacramento-Yolo, CA CMSA	24	–	–	–	–	–	17	–	33	21

[1] Metropolitan areas used in this table are categorized into Metropolitan Statistical Areas (MSAs) and Consolidated Metropolitan Statistical Areas (CMSAs) and are based on definitions from the Office of Management and Budget Bulletin Number 93-17, June 30, 1993.

[2] *Standard Industrial Classification Manual*, 1987 Edition.

[3] Includes fatalities to workers employed by governmental organizations regardless of industry.

[4] Also includes fatalities occurring in nonmetropolitan areas.

NOTE: Percentages may not add to totals because of rounding. There were 77 fatalities for which there was insufficient information to determine a specific industry classification, though a distinction between private and government was made for each.

Dashes indicate no data reported or data that do not meet publication criteria.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1993.

Table B-7. Fatal occupational injuries in selected metropolitan areas by major occupational group, 1993

Metropolitan area[1]	Total fatalities (number)	Occupation[2] (percent)						
		Managerial and professional specialty	Technical, sales, and administrative support	Service occupations	Farming, forestry, and fishing	Precision production, craft, and repair	Operators, fabricators, and laborers	Military occupations
Total U.S.[3]	6,271	11	13	9	15	17	31	2
New York-Northern New Jersey-Long Island, NY-NJ-CT-PA CMSA	364	10	20	10	2	16	41	1
Los Angeles-Riverside-Orange County, CA CMSA	279	12	22	16	4	18	22	6
Chicago-Gary-Kenosha, IL-IN-WI CMSA	153	6	14	15	3	20	38	–
Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD CMSA	127	17	19	10	4	21	26	2
Houston-Galveston-Brazoria, TX CMSA	124	10	20	10	4	19	31	–
Washington-Baltimore, DC-MD-VA-WV CMSA	122	16	20	13	6	20	21	5
San Francisco-Oakland-San Jose, CA CMSA	107	26	25	8	7	12	20	2
Dallas-Fort Worth, TX CMSA	103	5	17	11	6	22	38	–
Miami-Fort Lauderdale, FL CMSA	89	15	10	11	8	25	31	–
Atlanta, GA MSA	84	21	14	8	4	15	37	–
Detroit-Ann Arbor-Flint, MI CMSA	75	17	16	13	–	17	33	–
Boston-Worcester-Lawrence, MA-NH-ME-CT CMSA	60	8	18	18	5	35	15	–
San Diego, CA MSA	47	13	17	13	–	19	17	17
Tampa-St. Petersburg-Clearwater, FL MSA	44	9	14	9	16	14	39	–
Denver-Boulder-Greeley, CO CMSA	43	21	12	16	14	14	21	–
Milwaukee-Racine, WI CMSA	39	21	10	8	8	15	23	15
Seattle-Tacoma-Bremerton, WA CMSA	37	8	22	8	8	22	32	–
Cleveland-Akron, OH CMSA	33	15	–	12	9	30	27	–
Portland-Salem, OR-WA CMSA	33	15	18	15	9	24	18	–
St. Louis, MO-IL MSA	31	13	19	19	–	19	19	–
Cincinnati-Hamilton, OH-KY-IN CMSA	24	17	–	–	–	21	38	–
Sacramento-Yolo, CA CMSA	24	29	–	17	17	–	21	–

[1] Metropolitan areas used in this table are categorized into Metropolitan Statistical Areas (MSAs) and Consolidated Metropolitan Statistical Areas (CMSAs) and are based on definitions from the Office of Management and Budget Bulletin Number 93-17, June 30, 1993.

[2] Based on the 1990 Occupational Classification System developed by the Bureau of the Census.

[3] Also includes fatalities occurring in nonmetropolitan areas.

NOTE: Percentages may not add to totals because of rounding. There were 73 fatalities for which there was insufficient information to determine and occupation classification.

Dashes indicate no data reported or data that do not meet publication criteria.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1993.

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Appendix C. Partial data on fatal illnesses collected through the CFOI program, 1991-93

This appendix presents partial data on fatal illnesses collected through the Census of Fatal Occupational Injuries (CFOI), 1991-93. These data do not represent all deaths from occupational illnesses. These partial data cover nontraumatic conditions such as asbestosis, occupational cancers, and heart attacks. (See the technical note for the definition of occupational illness.)

It is difficult to compile a complete count of fatal occupational illnesses because the latency periods for many of these conditions may span years. In addition, there is some difficulty in linking illnesses to work exposures. Data presented in this appendix are incomplete, therefore, and do not represent all deaths that result from occupational diseases.

CFOI data collection methods require that the work relationship of work injury fatalities be substantiated by two or more independent sources. CFOI procedures do not require States to substantiate the work relationship of illnesses, however, because of the difficulty of associating diseases with workplace exposures.

Some of the illnesses presented in this appendix were the result of workplace exposures, such as asbestosis. Others, particularly some heart attacks and strokes, may have been the result of nonwork-related conditions or exposures. In still other instances, a workplace exposure or physical exertion may have aggravated a pre-existing condition. These partial data are presented for research purposes and without the implication that all illnesses had work-related causes.

Partial data on fatal illnesses by year, 1991-93

Year	Fatal illnesses
1991[1]	1,099
1992	1,361
1993	1,466

[1] Only 32 States participated in the 1991 CFOI program.

NOTE: These partial data on fatal illnesses were collected through the Census of Fatal Occupational Injuries, 1991-93. These data do not represent all deaths from occupational illnesses. The majority of these illnesses are heart attacks that occurred at work.

Table C-1. Fatal illnesses by selected worker characteristics, 1991-1993

Nature[1]	Total fatalities (number)	Percent distribution of fatalities by:								
		Sex		Age					Race	
		Men	Women	Less than 35 years	35-44 years	45-54 years	55-64 years	65 years and over	White	Black
Total	3,926	93	7	6	16	30	31	17	81	10
Systemic diseases and disorders	3,669	93	7	6	16	31	32	16	81	10
Nervous system and sense organs diseases	12	83	-	50	-	-	-	-	83	-
Circulatory system diseases	3,351	93	7	6	17	33	33	12	80	10
Hypertensive disease	32	97	-	-	19	34	34	9	59	34
Ischemic heart disease, including heart attack	2,797	94	6	5	16	33	33	12	81	9
Myocardial infarction (heart attack)	2,631	94	6	5	16	33	34	12	81	8
Ischemic heart disease, n.e.c.	140	94	6	6	27	31	29	6	79	18
Diseases of pulmonary circulation	31	90	10	13	26	19	23	19	68	26
Pulmonary heart disease	21	95	-	-	19	29	29	14	71	19
Other forms of heart disease	182	92	8	11	19	31	28	11	81	13
Heart failure	66	92	8	6	18	33	29	14	80	12
Ill-defined descriptions and complications of heart disease	11	100	-	36	-	-	-	-	64	-
Cerebrovascular disease	98	79	21	9	23	30	33	4	61	23
Stroke	62	82	18	6	24	31	31	6	56	24
Diseases of arteries, arterioles, capillaries	202	89	11	8	18	34	27	13	83	10
Aneurysm--nontraumatic	68	78	22	16	22	32	19	10	78	15
Respiratory system diseases	294	95	5	4	4	8	22	63	84	10
Pneumonia, influenza	18	78	22	22	17	-	22	28	56	39
Chronic obstructive pulmonary disease and allied conditions	32	81	19	12	-	22	19	41	88	12
Pneumoconioses	222	99	1	-	1	5	22	71	87	8
Coal workers' pneumoconioses	65	100	-	-	-	-	12	88	98	-
Asbestosis	132	98	2	-	-	8	24	67	84	8
Silicosis	15	100	-	-	-	-	53	33	67	27
Other respiratory system diseases	17	88	-	-	-	-	29	41	71	-
Pulmonary fibrosis, n.e.c.	10	90	-	-	-	-	40	50	60	-
Infectious and parasitic diseases	16	69	31	38	38	-	-	-	56	25
Cancer	188	99	-	-	3	11	32	52	87	7
Other diseases, conditions, and disorders	53	91	9	15	36	15	28	-	74	11

[1] Based on the 1992 BLS Occupational Injury and Illness Classification Structures. The nature identifies the principal physical characteristics of the injury or illness.

NOTE: These partial data on fatal illnesses were collected through the Census of Fatal Occupational Injuries, 1991-93. These data do not represent all deaths from occupational illnesses. Only 32 States participated in the 1991 CFOI program. Totals for major categories may include subcategories not shown separately. Percentages may not add to totals because of rounding.

Dashes indicate no data reported or data that do not meet publication criteria.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1991-1993.

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Table C-2. Fatal heart attacks that occurred at work by selected characteristics, occupation, and industry, 1991[1]-93

Characteristics	Fatal heart attacks
Total (number)	2,631
Percent	100
Sex:	
Men	94
Women	6
Age:	
Under 35 years	5
35 - 44 years	16
45 - 54 years	33
55 - 64 years	34
65 and over	12
Race:	
White	81
Black	8
Other or unspecified	11
Worker activity:	
Vehicular operations	14
Driving or operating a vehicle	11
Driving a truck	7
Using, operating tools, machinery	5
Constructing, repairing, cleaning	10
Handling materials (lifting, carrying, loading)	7
Protective service activities	3
Other service, retail activities	6
Other physical activities	20
Sitting	7
Walking	5
Standing	4
Other or unspecified	35
Day of week:	
Sunday	6
Monday	21
Tuesday	16
Wednesday	16
Thursday	16
Friday	16
Saturday	9

Characteristics	Fatal heart attacks
Occupation (number)	2,631
Percent	100
Managers and professionals	11
Executives, administrators, and managers	7
Technical, sales, and administrative support	11
Service occupations	18
Protective service	8
Janitors and cleaners	5
Farming, forestry, and fishing	6
Precision production, craft, and repair	18
Mechanics and repairers	6
Construction trades	8
Operators, fabricators, and laborers	35
Machine operators	6
Truck drivers	14
Laborers	6
Industry (number)	2,631
Percent	100
Agriculture, forestry, and fishing	5
Mining	2
Construction	12
Special trades contractors	6
Manufacturing	18
Transportation and public utilities	13
Trucking and warehousing	9
Wholesale trade	5
Retail trade	9
Finance, insurance, real estate	3
Services	16
Business services	5
Government	17
Local	12

[1]Only 32 States participated in the 1991 CFOI program.

NOTE: These partial data on fatal heart attacks at work were collected through the Census of Fatal Occupational Injuries, 1991-93. It is not implied that the causes of these heart attacks were work-related in all cases. Totals for major categories may include subcategories not shown separately. Percentages may not add to totals because of rounding.

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics, Census of Fatal Occupational Injuries, 1991-93.

Table C-3. Fatal asbestos-related illnesses by selected characteristics, 1991[1]-93

Characteristic	Fatal illnesses
Total (number)	294
Percent	100
Sex:	
Men	99
Women	1
Age:	
Under 45 years	1
45 - 54 years	8
55 - 64 years	28
65 and over	63
Race:	
White	88
Black	7
Other or unspecified	5
Nature of illness:	
Asbestosis	45
Cancer, primarily lung cancer and mesothelioma	49
Other or unspecified respiratory diseases	6
Other diseases	1

Characteristic	Fatal illnesses
Occupation (number)	294
Percent	100
Managers and professionals	6
Precision production, craft, and repair	56
Mechanics and repairers	8
Vehicle, mobile equipment mechanics, repairers	5
Construction trades	30
Electricians	5
Plumbers, pipe fitters, steam fitters	8
Precision production	17
Precision metal workers	10
Operators, fabricators, and laborers	21
Machine operators, assemblers and inspectors	13
Machine operators	5
Welders and cutters	5
Handlers, equipment cleaners, helpers, and laborers	6
Military	10
Other	7
Industry (number)	294
Percent	100
Mining	2
Construction	22
Special trades contractors	19
Plumbing, heating, air conditioning	5
Masonry, stonework, tile setting, plastering	4
Manufacturing	40
Petroleum refining	6
Ship, boat building and repair	20
Transportation and public utilities	7
Wholesale and retail trade	4
Government	19
Federal	14
Ship, boat building and repair	8
National security	4
Other	6

[1]Only 32 States participated in the 1991 CFOI program.

NOTE: These partial data on fatal asbestos-related illnesses were collected through the Census of Fatal Occupational Injuries, 1991-93. These data do not represent all deaths from asbestos-related illnesses. Totals for major categories may include subcategories not shown separately.

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics, Census of Fatal Occupational Injuries, 1991-93.

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Appendix D. Summaries of Conferences and Meetings

This appendix presents summaries of conferences and meetings where Census of Fatal Occupational Injuries (CFOI) data were presented or relevant data were discussed. Conferences and meetings provide the opportunity to receive insights from data users which can be used to improve the CFOI program.

The Annual National Safety Council Congress and Exposition

The Bureau of Labor Statistics (BLS) was invited to have an information booth at the 1994 Annual National Safety Council Congress and Exposition held at the San Diego Convention Center in October. The event attracted over 20,000 safety and health professionals and guests. Secretary of Labor Robert B. Reich delivered the opening address and responded to audience questions via satellite.

Over 6,000 reprints of BLS injury and illness articles and publications were distributed to more than 2,000 visitors. Almost 500 conference participants left their business cards, requesting to be put on the mailing list. Although the booth's activities were coordinated by the national office, staffing was provided by representatives of the BLS regional office and State agencies. Larry Baumgartner and Rich Haglund of the San Francisco regional office both assisted in staffing the booth, as well as two State representatives—Lillia Vargas of California and Susan Diaz of Arizona.

The National Safety Council's objective is the implementation of safety, health, and environmental policies, practices, and procedures that prevent and mitigate human suffering and economic losses arising from preventable causes. The Council is a nongovernmental, not-for-profit, public service organization, chartered by an act of Congress, with membership from business, labor, government, and academia. The Council regularly sponsors events to promote its safety and health agenda.

The 122nd Annual Meeting and Exhibition of the American Public Health Association

Two studies using Census of Fatal Occupational Injuries data were presented at the 122nd Annual Meeting and Exhibition of the American Public Health Association (APHA) held in Washington, DC in October 1994. Janice Windau, a BLS epidemiologist, presented "Fatal Work Injuries of the Self-Employed," and Blaine Derstine, a BLS economist, presented "Young Workers at Risk of Fatal Injury."

The self-employed. Persons working for themselves were fatally injured more often than wage and salary workers in 1993. Nineteen percent of the 6,271 fatally injured workers in 1993 were self-employed, while the self-employed accounted for only 9 percent of jobholders. Two-fifths of the fatally injured self-employed worked in farming, forestry, and fishing occupations.

Transportation incidents that occurred off the roadway, such as tractor rollovers, and homicides were the leading fatal events for the self-employed. Highway motor vehicle crashes and homicides were the leading fatal events for wage and salary workers. About a quarter of the fatally injured self-employed were age 65 or older.

Young workers. During the years 1992-1993, there were 344 fatalities of workers under age 20. The leading fatal events for these workers were transportation incidents, which accounted for 40 percent of the total; assaults and violent acts, primarily homicides (22 percent); and contacts with objects or equipment, such as being struck by an object or being caught in machinery (18 percent).

Ninety-two percent of the assaults and violent acts occurred in metropolitan areas. In rural areas, transportation incidents, primarily noncollision incidents, such as tractor rollovers and single-vehicle highway crashes, accounted for almost half of the deaths.

More than two-fifths of fatally injured young workers held jobs in agriculture, forestry, and fishing and in retail trade. About three-fourths of the fatally injured workers under age 14 held jobs in agriculture, forestry, and fishing industries.

These two studies on self-employed and young worker fatalities were among 3,000 other studies presented at the APHA meeting. APHA was founded in 1872 to protect and promote personal and environmental health by exercising leadership in the development and dissemination of health policy. It is the largest public health association in the world with a membership of 50,000.

Meeting of the National Advisory Committee on Occupational Safety and Health

Bureau of Labor Statistics Commissioner Katharine Abraham was invited by the National Advisory Committee on Occupational Safety and Health (NACOSH) to present data from the redesigned work injury and illness programs—the Census of Fatal Occupational Injuries and the Survey

of Occupational Injuries and Illnesses—at one of its regular meetings in February 1995. NACOSH was established by the Occupational Safety and Health Act of 1970 to advise the Secretaries of Labor and Health and Human Services on occupational safety and health programs and policies.

NACOSH has 12 members: 2 each representing management, labor, occupational health professionals, and occupational safety professionals; and 4 members representing the public. The Secretary of Health and Human Services designates the two health professionals and two of the public members. The remainder are nominated by the Secretary of Labor, who also names the chairperson from the public members.

NACOSH meetings are held regularly during the year and are open to the public. The meetings focus on current workplace safety and health issues.

Prior to 1970, few Federal laws focused on workplace safety and health. This began to change during the 1960s when the United States Congress passed several laws directed at work-related safety and health issues. These laws targeted specific groups of workers and did not cover the majority of workers.

The act, administered primarily by the U.S. Department of Labor, covers private sector employers with one or more employees in the United States and its territories. Federal, State, and local government employees are excluded from coverage, as are activities covered by the Federal Mine Safety and Health Act of 1977, or by other Federal laws.

Several Federal agencies were created by or given additional responsibilities under the act. The Occupational Safety and Health Administration (OSHA) was created with the authority to set and change work safety and health standards, inspect work sites, enforce standards, and require employers to maintain safety and health records. The act also created the National Institute for Occupational Safety and Health (NIOSH) in the Department of Health and Human Services to conduct research on work safety and health standards and to publish annually a list of all known toxic substances. The Bureau of Labor Statistics was given the responsibility of developing and maintaining a program of work safety and health statistics. In addition, the Occupational Safety and Health Review Commission was created as an agency independent of the U.S. Department of Labor to adjudicate disputes between employers and OSHA over enforcement actions.

The Business and Labor Research Advisory Councils

BLS staff from the Census of Fatal Occupational Injuries and the Survey of Occupational Injuries and Illnesses programs of the Bureau of Labor Statistics meet regularly with members of the Business Research Advisory Council (BRAC) and the Labor Research Advisory Council (LRAC). BRAC and LRAC members are briefed by BLS staff on developments in the safety and health statistics programs and are provided with current data products. In return, BRAC and LRAC members provide advice and comments that help guide improvements in the collection and dissemination of BLS safety and health data. Since 1947, BRAC and LRAC have provided BLS with advice on technical questions and furthered the understanding and acceptance of its statistical series and analytical reports.

BRAC members come from the business community and may be associated with trade associations or individual firms.

LRAC members come from the labor unions and other labor-related organizations. They bring to the council their knowledge of the interests and perspectives of the labor community.

Both BRAC and LRAC function through the work of standing committees. Each council has a committee for each major BLS program area, such as occupational safety and health statistics, that meets with BLS staff to discuss current matters of interest two or three times annually. BRAC and LRAC committee meetings are held separately and at different times during the year. Council and committee meetings are open to the public.

BRAC and LRAC members are free to raise any issue concerning BLS programs and provide their views on policy and technical matters, but responsibility for decisions on those matters rests with the Commissioner of the Bureau of Labor Statistics. BRAC and LRAC members serve 2-year terms and may be reappointed for additional terms.

Meeting of the Occupational Safety and Health State Plan Association

BLS Commissioner Abraham also spoke at the January 1995 meeting of the Occupational Safety and Health State Plan Association (OSHSPA), which meets several times a year. The meeting was attended by representatives from Congress, the Occupational Safety and Health Administration, the National Institute for Occupational Safety and Health, BLS, and business, labor, and occupational safety and health professionals.

Using data from the Survey of Occupational Injuries and Illnesses, Commissioner Abraham discussed the four industries with the highest rates of lost workday cases due to occupational injury or illness. These industries are shipbuilding and repairing, bottled and canned soft drinks, logging, and truck trailer manufacturing. She pointed out that similar lists can be developed for specific injuries, such as back injuries or injuries due to repetitive motion.

Commissioner Abraham also presented an index of relative risk, which is used to compare the risk of nonfatal injury among worker groups. The index was calculated for nonfarm private wage and salary workers, 15 years and older, using data for nonfatal injuries resulting in lost workdays from the Survey of Occupational Injuries and Illnesses, and hours at work data (exposure data) from the Current Population Survey (CPS). The data show that nonconstruction laborers and nursing aides and orderlies have a

relatively higher risk of nonfatal injury and illness than other workers.

A similar index can be used to assess the risk of fatal injury, using data from the Census of Fatal Occupational Injuries and hours at work data from the CPS. The fatal injury risk index for timber cutters, airplane pilots, fishers, and farm supervisors was 20 times higher than for the average worker. Commissioner Abraham noted that work in these jobs is generally performed outdoors, rather than in factories.

She concluded the presentation by comparing workplace assaults that resulted in fatal and nonfatal injuries, and distributed examples of publications States can use to inform workers of workplace hazards.

OSHSPA serves the to administrators of State agencies that operate occupational safety and health programs under sections 18b and 18e of the Occupational Safety and Health Act of 1970. These sections authorize the establishment of State-run occupational safety and health programs, with the stipulation that they meet Federal standards. About 25 States and territories operate such programs, with half the funding provided by the State and half provided by the Federal Government.

The 10th Annual National VPPPA Conference

The BLS was invited to participate in a workshop on workplace violence and security at the 10th Annual Voluntary Protection Programs Participants' Association Conference held in Phoenix, AZ in September 1994. Guy Toscano, from the BLS national office, presented a comparison between 1993 Census of Fatal Occupational Injuries data and data from the 1992 Survey of Occupational Injuries and Illnesses (private sector cases with days away work).

Other members serving on the panel with Mr. Toscano included Susan Fox, Special Assistant to the Assistant Secretary of Labor for the Occupational Safety and Health Administration; and Michael Smith, a security advisor for Mobil Oil. Each panel member made a presentation on the subject of workplace violence, which was followed by a panel discussion.

VPPPA is an inter-industry association that provides a forum for those committed to ensuring that business establishments are safe and healthful workplaces. The purpose of the conference was to bring together representatives from labor, business, government, and safety and health organizations to recognize and reward worksites that achieved a desired level of excellence in safety and health management. There are currently over 50 worksites in the VPPPA, representing major companies in chemicals, construction, food processing, hospitals, and manufacturing.

Conference on Violent Crime and Drug Abuse

Bureau personnel participated on a panel addressing the issue of workplace violence, at a conference on violent crime and drug abuse sponsored by the U.S. Department of Justice, Bureau of Justice Assistance in December 1994. The conference was entitled State and Local Government Conference on Violent Crime and Drug Abuse. Its theme was creating and implementing solutions to problems of violent crime and drug abuse by reinforcing government and community partnerships. Conference participants included State and Federal law enforcement officials, as well as members of crime prevention organizations, such as the National Crime Prevention Council, and the Justice Research and Statistics Association.

Guy Toscano presented Census of Fatal Occupational Injuries data showing that no occupation is immune from workplace violence. Victims of workplace homicides worked as taxicab drivers, cooks, food servers, auto mechanics, and cashiers. Workers at particular risk are those who handle money, work alone, or work late at night.

Contrary to popular belief, current and former coworkers are not the primary perpetrators of workplace homicides. Only 1 in 7 of workplace homicide victims was killed by a work or personal associate. Most homicide victims murdered at work were killed by strangers whose primary motive was robbery.

The Bureau of Justice Assistance is the primary administrator of grant provisions in the Violent Crime Control and Law Enforcement Act of 1994. The act will appropriate $30.2 billion over a 6-year period to State and local governments for crime prevention programs, the most of any U.S. anti-crime legislation.

The American National Standards Institute

The American National Standards Institute (ANSI) is considering approval of the BLS Occupational Injuries and Illnesses Classification Structures (OIICS) as the national standard for coding workplace injuries and illnesses. ANSI is a federation of manufacturers, trade associations, technical societies, professional groups, and consumer organizations that coordinates the effort to eliminate duplicate standards and to create universal business and technical standards that are accepted nationwide.

Since 1918, ANSI has approved over 4,000 standards for a broad range of issues, such as thread pitches for screws, nuts and bolts; computer software; and occupational safety and health. ANSI standards are widely used in business and government, in spite of the fact that they are voluntary. ANSI approves a standard only after inquiries have been conducted and consensus has been established.

ANSI accomplishes its mission through the work of committees. The Z16 committee, sponsored by the National Safety Council and the Association of Casualty and Surety Companies, has four subcommittees:

> Subcommittee Z16.2 handles matters concerning the 1962 standards, Method of Recording Basic Facts Relating to the Nature and Occurrence of Work Injuries. (This subcommittee is responsible for the BLS OIICS approval process);

- Subcommittee Z16.3 handles matters concerning the 1989 standards, American National Standard for Injury Statistics—Employee Off-The-Job Injury Experience—Recording and Measuring;

- Subcommittee Z16.4 handles matters concerning the 1977 standards, American National Standard for Uniform Recordkeeping for Occupational Injuries and Illnesses; and

- the Subcommittee on Interpretations handles requests for interpretation of the Z16 committee's standards.

If approved, BLS' OIICS will have been preceded by a number of standards. The first standard was set forth in a 1920 BLS bulletin (No. 276), *Standardization of Industrial Accident Statistics*. It was revised several times and finally replaced by the current standard in 1962. Several concepts in BLS' OIICS were derived from the current standard, as well as from the International Classification of Diseases-9th Edition, which is used to code medical and death records.

The Z16 Committee met in February 1995 to review the subcommittee recommendation to replace the 1962 standard with BLS' OIICS. If the recommendation is approved, the OIICS will be submitted to ANSI for approval as the national standard. The recommendation is expected to be sent to ANSI in the autumn of 1995.

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Appendix E. State CFOI Agencies and Telephone Numbers

State	Agency	Telephone
Alabama	Department of Labor	(205) 242-3460
Alaska	Department of Labor	(907) 465-4539
Arizona	Industrial Commission	(602) 542-3739
Arkansas	Department of Labor	(501) 682-4542
California	Department of Industrial Relations	(415) 703-5661
Colorado	Department of Health	(303) 692-2164
Connecticut	Labor Department	(203) 566-4380
Delaware	Department of Labor	(302) 577-2889
District of Columbia	Commission of Public Health	(202) 727-0682
Florida	Department of Labor and Employment Security	(904) 922-8953
Georgia	Department of Labor	(404) 656-3032
Hawaii	Dept. of Labor and Industrial Relations	(808) 586-9005
Idaho	Industrial Commission	(208) 334-6050
Illinois	Department of Public Health	(217) 785-1873
Indiana	Department of Labor	(317) 232-2679
Iowa	Department of Employment Services	(515) 281-5151
Kansas	Department of Health and Environment	(913) 296-5641
Kentucky	Labor Cabinet	(502) 564-2454
Louisiana	Department of Labor	(504) 342-3126
Maine	Bureau of Labor Standards	(207) 624-6442
Maryland	Division of Labor and Industry	(410) 333-4202
Massachusetts	Department of Public Health	(617) 727-2735
Michigan	Department of Labor	(517) 322-1851
Minnesota	Department of Labor and Industry	(612) 297-7428
Mississippi	Department of Health	(601) 960-7741
Missouri	Bureau of Health Services Statistics	(314) 751-6274
Montana	Department of Labor and Industry	(800) 541-3904
Nebraska	Workers' Compensation	(402) 471-3547
Nevada	Division of Industrial Relations	(702) 687-3293
New Hampshire	Department of Public Health	(603) 271-4651
New Jersey	Department of Health	(609) 984-1863
New Mexico	Health and Environment Division	(505) 827-2877
New York	Department of Health	(518) 458-6228
New York City	Department of Health	(212) 788-4585
North Carolina	Department of Labor	(919) 733-2355
North Dakota	Bureau of Labor Statistics	(816) 426-2481
Ohio	Department of Health	(614) 466-4183
Oklahoma	Department of Labor	(405) 528-1500
Oregon	Dept. of Consumer and Business Services	(503) 373-1352
Pennsylvania	Department of Health	(717) 783-2548
Rhode Island	Department of Health	(401) 277-2812
South Carolina	Department of Labor	(803) 734-9661
South Dakota	Bureau of Labor Statistics	(816) 426-2481
Tennessee	Department of Labor	(615) 741-1991
Texas	Workers' Compensation Commission	(512) 440-3864
Utah	Industrial Commission	(801) 530-6823
Vermont	Department of Labor and Industry	(802) 828-2765
Virginia	Department of Labor and Industry	(804) 786-6427
Washington	Department of Labor and Industries	(206) 956-5509
West Virginia	Department of Labor	(304) 558-7890
Wisconsin	Workers' Compensation Division	(608) 266-7850
Wyoming	Department of Employment	(307) 777-5646

Appendix F. List of CFOI Research Articles and Reports

John W. Ruser, "A Relative Risk Analysis of Workplace Fatalities," *Compensation and Working Conditions*, January 1995, pp. 41-45.

"Occupational Injuries and Illnesses and Work-Related Fatalities," *Compensation and Working Conditions*, January 1995, pp. 88-97.

Elyce Biddle, "Standardized Coding of Occupational Injuries and Illnesses," *Compensation and Working Conditions*, November 1994, pp. 1-6.

Guy Toscano and Janice Windau, "The Changing Character of Fatal Work Injuries," *Monthly Labor Review*, October 1994, pp. 17-28.

William M. Marine, MD and Tracy Jack, "Analysis of Toxicology Reports from the 1992 Census of Fatal Occupational Injuries," *Compensation and Working Conditions*, October 1994, pp. 1-6.

Letitia K. Davis, Daniel R. Brooks., Lynn E. Taylor, and Cathy Schwartz, "Data Sources for Fatality Surveillance in Commercial Fishing: Massachusetts, 1987-91," *Compensation and Working Conditions*, July 1994, pp. 7-13.

Andrew T. Knestaut, "Fatal Occupational Injuries of Women in 1992," *Compensation and Working Conditions*, May 1994, pp. 1-6.

Gary A. Helmer, "Fatalities Involving Forklifts and Other Powered Industrial Carriers, 1991-1992," *Compensation and Working Conditions*, May 1994, pp. 7-12.

Fatal Workplace Injuries in 1992: A Collection of Data and Analysis, Bureau of Labor Statistics, Report 870, April 1994.

Scott Richardson and Andrew Schulman, "Texas Study Finds Older Workers at Relatively High Risk of Fatal Occupational Injury," *Compensation and Working Conditions*, April 1994, pp. 1-8.

Theresa Hanson, "Fatal Work Injuries in the Mountain States," *Compensation and Working Conditions*, March 1994, pp. 1-4.

Janice Windau and Guy Toscano, "Workplace Homicides in 1992," *Compensation and Working Conditions*, February 1994, pp. 1-8.

Tracy A. Jack and Mark J. Zak, "Results from the First National Census of Fatal Occupational Injuries, 1992," *Compensation and Working Conditions*, December 1993, pp. 1-14.

Guy Toscano and Janice Windau, "Fatal Work Injuries: Results from the 1992 National Census," *Monthly Labor Review*, October 1993, pp. 39-48.

Scott Richardson, "Workplace Homicides in Texas, 1990-91," *Compensation and Working Conditions*, May 1993, pp. 1-6.

Bureau of Labor Statistics, *Fatal Workplace Injuries in 1991: A Collection of Data and Analysis*, Report 845, April 1993.

Lisann Rolle, "Using Improved Data on Work-Related Vehicle Fatalities in Washington State," *Compensation and Working Conditions*, March 1993, pp. 1-9.

Marcia R. Blake, "Length of Time in Position and Fatal Occupational Injury in Colorado," *Compensation and Working Conditions*, March 1993, pp. 10-14.

"Census of Fatal Occupational Injuries: Results for 32 States, 1991," *Compensation and Working Conditions*, February 1993, pp. 1-13.

William M. Marine, MD, MPH, Blaine Derstine, Tracy A. Jack, "Analysis of Toxicology Reports from the 1991 Census of Fatal Occupational Injuries (CFOI)," *Compensation and Working Conditions*, February 1993, pp. 14-20.

Conference Papers, *Monthly Labor Review*, December 1992, pp. 49-51.

Tracy A. Jack and Mark Zak, "Fatal Occupational Injuries: Results from BLS Census of 31 States," *Compensation and Working Conditions*, December 1992, pp. 1-5.

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Lynn Taylor, Letitia K. Davis, and Daniel Brooks, "Surveillance of Fatal Occupational Injuries in Massachusetts: The Response of Next-of-Kin," *Compensation and Working Conditions*, December 1992, pp. 6-9.

Guy Toscano and Janice Windau, "Fatal Work Injuries: Census for 31 States," *Monthly Labor Review*, September 1992, pp. 3-8.

John J. Kane and Blaine Derstine, "Fatal Occupational Injuries: Test Results from the BLS Census," *Compensation and Working Conditions*, April 1992, pp. 3-9.

Guy Toscano and Janice Windau, "Further Testing of a Census Approach to Compiling Data on Fatal Work Injuries," *Monthly Labor Review*, October 1991, pp. 33-36.

Guy A. Toscano, "The BLS Census of Fatal Occupational Injuries," *Compensation and Working Conditions*, June 1991, pp. 1-2.

Janice Windau and Donna Goodrich, "Testing a Census Approach to Compiling Data on Fatal Work Injuries," *Monthly Labor Review*, December 1990, pp. 47-49.

Technical Note

CFOI work relationship criteria

A *work relationship* exists if an event or exposure results in fatal injury or illness to a person:

- On the *employer's premises* and the person was there to *work*; or
- Off the *employer's premises* and the person was there to *work*, or the event or exposure was related to the person's *work* or status as an employee.

The *employer's premises* include buildings, grounds, parking lots, and other facilities and property used in the conduct of business. *Work* is defined as duties, activities, or tasks that produce a product or result; that are done in exchange for money, goods, services, profit, or benefit; and, that are legal activities in the United States.

The following are clarifications of the CFOI work relationship criteria.

- *Volunteer workers* who are exposed to the same work hazards and perform the same duties or functions as paid employees, and who meet the CFOI work relationship criteria, are in scope.
- *Institutionalized persons*, including inmates of penal and mental institutions, sanitariums, and homes for the aged, infirm and needy are out of scope. Institutionalized persons who are fatally injured or become fatally ill while employed off the premises of their institutions, however, are in scope.
- *Suicides* and *homicides* that meet the CFOI work relationship criteria are in scope.
- *Fatal heart attacks* and *strokes* are in scope, if they occurred on or off the employer's premises and the person was there to work. Fatal heart attacks and strokes that occurred under other circumstances are out of scope, unless work relationship is verified.
- *Travel status*: Fatal events or exposures that occurred when a person was in travel status are in scope, if the travel was for work purposes or was a condition of employment. Clarification regarding recreational activities (see below) also applies to a person who was in travel status.
- *Recreational activities*: Fatal events or exposures that occurred during a person's recreational activities, that were not required by the person's employer, are out of scope.
- *Commuting*: Fatal events or exposures that occurred during a person's commute to or from work are out of scope.

Definitions of traumatic injury and occupational illness

Traumatic injury. This is any unintentional or intentional wound or damage to the body resulting from acute exposure to energy—such as heat or electricity or kinetic energy from a crash—or from the absence of such essentials as heat or oxygen caused by a specific event, incident, or series of events within a single workday or shift.

Occupational disease (illness). This is defined as a condition produced in the work environment over a period longer than 1 workday or shift. Usually an illness is due to repetitive factors over a period of time. It may result from systemic infection, repeated stress or strain, exposure to toxins, poisons, fumes, or other continuing conditions of the work environment.

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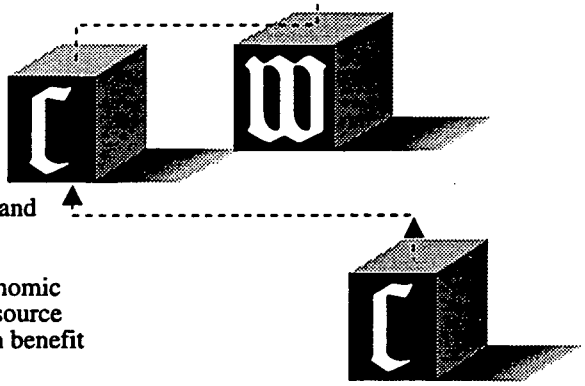

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