

Using the BLS Occupational Injury and Illness Classification System as a Safety and Health Management Tool

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Years in the making, the Bureau of Labor Statistics' (BLS) Occupational Injury and Illness Classification System enables safety and health professionals and other data users to better monitor work injuries, illnesses, and fatalities; promote safer work practices; develop new safety equipment; assess and improve workplace standards; and better use scarce resources.

The Occupational Injury and Illness Classification System (OIICS) developed by BLS provides a set of procedures for selecting and recording facts relating to an occupational injury, illness, or fatality.¹ Uniformly coded data provide safety and health professionals and policy analysts with information to develop programs designed to reduce hazards in the workplace.

Description of OIICS

OIICS classifies selected characteristics of individual injury and illness incidents. This information generally comes from administrative records such as employer logs and

workers' compensation reports. While viewing these reports separately may give researchers a general idea of the types of hazards faced by workers, they will not produce the data on such key factors as hazardous equipment and exposures needed to systematically develop and set priorities for injury prevention efforts. Recognizing the shortcoming of reviewing cases individually, standardized coding is used to uniformly classify similar events and circumstances resulting in serious injury and disease.

OIICS includes the following five classification structures that describe the injury or illness and how it occurred: Nature of injury or illness, part of body affected, source of injury or illness, event or exposure, and secondary source of injury or illness.

With the exception of secondary source, these categories are ultimately based on the American National Standards Institute (ANSI) Z16.2.² OIICS is also designed to be as compatible as possible with the *International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9 CM)*, which is widely used in the medical community.³

Nature of injury or illness describes the physical characteristics of the injury or illness; part of body identifies the part of the body directly affected by the nature; source identifies the object or substance that directly inflicted the injury or illness; event or exposure describes the manner in which the injury or illness was inflicted by the source; and secondary source identi-

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fies other objects or substances, if any, that contributed to the event or exposure. The same code list is used for both source and secondary source.

Each classification structure has four levels of detail for recording the characteristics of the injury or illness—a very general grouping called the division level, the 2-digit major group level, and the more detailed 3- and 4-digit levels. This hierarchical arrangement accommodates variations in the level of detail available on reporting forms. For example, a delivery truck involved in a crash injuring the driver could variously be identified on the reporting form and subsequently coded as to source as a delivery truck (code 8251), a truck (code 8250), a highway motor vehicle (code 8200), or just a vehicle (code 8000).

Such a hierarchical arrangement enables classification system users to code some or all data element categories at either full detail, or some less detailed level of aggregation, consistent with their needs. Moreover, researchers can readily tabulate data at a less detailed level of aggregation than the level at which the data are coded, if this would enhance data presentation or otherwise better fulfill their research needs.

Because of the varied occupational injury and illness data needs BLS is called upon to fulfill, BLS and its participating State agencies code occupational injury and illness data at full detail. A nonparticipating State workers' compensation agency wishing to adopt OIICS, but due to administrative or research requirements not wishing to code at full detail, would, however, be able to use the system to code at a more general level. For example, a workers' compensation agency only interested in knowing the general class of vehicles involved in motor vehicle incidents could code vehicles to the 3-digit level. Thus, all trucks would be coded using a single source code (8250). Were the agency interested in detailed information for tractor-trailer trucks, and wished to

lump all other trucks together, it could retain the 4-digit code for tractor-trailer trucks (code 8254), and place all other types of trucks into the not elsewhere classified category (code 8259), and use truck, unspecified (code 8250) when source documents are unclear as to the type of truck involved in the incident.

Alternatively, the agency could code to the level of detail provided on the source document and then tabulate to a general or summary level. This flexibility allows subsequent users of the data to perform more detailed studies than originally planned.

Rules of selection, code descriptions, alphabetical indices, and edit criteria help ensure that data available for analysis are uniformly coded as well as useful for developing prevention strategies. The concept of the rules of selection originated with the ANSI Z16.2-1962 system. These rules along with the code descriptions instruct coders how to select the correct category when the incident appears to fit into more than one code category. To illustrate: a trucker dies of burns after his semitrailer truck crashes into a bridge abutment and bursts into flames. Would this case be coded as a fire or as a highway crash? According to the rules of selection and code descriptions for event, the incident is classified as a highway crash because the rules of selection state that transportation incidents take precedence over fires.

Edit criteria were developed to ensure the accuracy of the coded data. These criteria not only screen for valid numeric codes, but also check for inconsistencies between characteristics. For example, data records are screened to ensure that the part of body is not coded toe when the nature of injury and illness is classified as an intracranial injury.

Industry of worker

The industry describes the kind of business in which the injured worker's employer is engaged. The establishment is classified according

to the Office of Management and Budget's *Standard Industrial Classification (SIC) Manual*, 1987 Edition.⁴ That system is the standard for classifying industries among Federal and State governmental agencies, trade associations, and private research organizations. Codes are assigned based on the primary activity performed by the establishment.

The *SIC Manual's* hierarchical arrangement of categories with detailed code descriptions served as the model for the *OIICS Manual*.

Occupation of worker

The occupation describes the type of job held by the worker at the time of the injury. The occupation coding structure is adapted from the Bureau of the Census 1990 Occupational Classification System, which is used in the BLS occupational safety and health program, and includes approximately 500 individual occupations grouped under major categories.⁵ For example, under construction trades a coder would find categories for carpenters (code 567), roofers (code 595), and 28 other construction trade occupations.

Case scenarios using OIICS

The coding of the following three cases exemplifies the use of BLS's new system for classifying occupational injuries and illnesses.

Case 1. A carpenter who worked for a general contractor building single family homes, received a concussion when struck by a brick that fell from a scaffold above him.

| Characteristics | Category | Code |
|-------------------|----------------------------------|------|
| Nature of injury | Concussion | 0620 |
| Part of body | Brain | 0110 |
| Source of injury | Brick | 4111 |
| Event or exposure | Struck by falling object | 0210 |
| Secondary source | Scaffold | 6460 |
| Industry | General contractor—single houses | 1521 |
| Occupation | Carpenter | 567 |

Case 2. A crane operator who worked for a structural steel erection company was electrocuted when he raised the crane boom hitting a high voltage line.

| <i>Characteristic</i> | <i>Category</i> | <i>Code</i> |
|-----------------------|-----------------------------------|-------------|
| Nature of injury | Electrocution | 0930 |
| Part of body | Body system | 5000 |
| Source of injury | Crane, unspecified | 3430 |
| Event or exposure | Contact with overhead power lines | 3130 |
| Secondary source | Power lines, transformers | 4415 |
| Industry | Structural steel erection | 1791 |
| Occupation | Crane operator | 849 |

Case 3. A bricklayer working for a masonry contractor developed carpal tunnel syndrome from repeatedly using a trowel to scoop mortar while laying bricks.

| <i>Characteristic</i> | <i>Category</i> | <i>Code</i> |
|-----------------------|---------------------------|-------------|
| Nature of injury | Carpal tunnel syndrome | 1241 |
| Part of body | Wrist | 3200 |
| Source of injury | Bodily motion or position | 5620 |
| Event or exposure | Repetitive use of tools | 2320 |
| Secondary source | Trowel | 7134 |
| Industry | Masonry, stone setting | 1741 |
| Occupation | Bricklayer | 563 |

A management information system

Coding information on occupational injuries and illnesses permits creation of a database that policy analysts and safety and health professionals can use to develop employee safety awareness and training programs to prevent recurrence of serious injuries.

The two BLS programs using OIICS are the Census of Fatal Occupational Injuries and the Survey of (Nonfatal) Occupational Injuries and Illnesses. Both of these programs are Federal-State cooperative systems whereby participating State agencies assist in collecting and

classifying the data. While State agencies participating in the fatality census code the OIICS characteristics for all in-scope fatalities, States participating in the survey of nonfatal injuries and illnesses code only those cases that result in 1 or more lost workdays.

Tables 1-4 show the types of data that can be generated for analysis using the coded information from the 1994 Census of Fatal Occupational Injuries and the 1993 Survey of Occupational Injuries and Illnesses. Construction industries and occupations are highlighted in these tables to illustrate the system's use as a management tool for studying occupational injuries and illnesses to develop prevention strategies.

Table 1 presents fatality data by industry division and major event or division level event categories. Detailed industries are shown for construction illustrating the hierarchical format of the SIC structure. The table shows the general types of incidents involved in fatalities to workers in the various construction industries. For example, data under heavy construction (SIC 162) include data for the subcategory water, sewer, and utility lines (SIC 1623). Almost 40 percent of the fatalities in this four-digit SIC resulted from exposure to harmful substances or environments, the division-level event category which includes contacts with electricity, temperature extremes, exposures to toxic substances, and exposure to oxygen-deficient environments.

Table 2 lists these and other detailed event and exposure categories for fatalities in the 2-digit SICs in construction, illustrating the specific ways in which construction workers were killed. Such information can be used to set priorities for prescriptive measures in the 2-digit construction industries. For example, falls to lower levels resulted in 316 fatalities in the construction industry in 1994 and almost 40 percent of the fatalities for workers

in the general building and special trades industries.

Similar analysis of fatal work injuries can be performed for occupation. Table 3 shows major fatal events for workers in various occupations in the construction industry.

Table 4 presents data for nonfatal occupational injuries and illnesses involving days away from work for construction laborers. Besides the case characteristics coded in accordance with OIICS, the table shows the demographic characteristics of injured workers (sex, age, race), the length of time the worker had been with the employer, and the length of time it took the worker to recuperate from the injury. The table shows, for example, that about 10 percent of lost workday injuries sustained by construction laborers are fractures and that the median number of days it took for recuperation from these fractures was 20 days away from work. Hence, measures taken that prevent fractures could result in significant cost and time savings to employers. Further analysis of the injury data for fractures to construction laborers by specific event and exposure category may lead to measures that will assist in this effort.

Data sources

The two data series used in the above analysis are drawn from two Bureau of Labor Statistics programs—the Census of Fatal Occupational Injuries and the Survey of Occupational Injuries and Illnesses. Data from both programs are used by employers, workers, and safety and health specialists in efforts to prevent job-related injuries and illnesses.

The Census of Fatal Occupational Injuries compiles a systematic, verifiable count of fatal work injuries as well as detailed information on how these events occurred. Because studies have shown that no single data source captures all worker deaths, multiple data sources are

used to identify, verify, and profile fatal work injuries. 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 possible. Information such as the type of incident and machinery or equipment involved; nature of injury and part of body affected; occupation, age, race, and sex of the worker; the location of the incident; and industry of the employer is coded for each fatal injury. Summary data tables are released approximately 8 months after the end of the reference year. Data are available for all 50 States and the District of Columbia starting with 1992.

The Survey of Occupational Injuries and Illnesses is based on a scientifically selected sample of business establishments in the private sector. The survey profiles workers and case characteristics of serious nonfatal workplace injuries and illnesses resulting in lost worktime as well as frequency counts and incidence rates by industry. Incidence rates are released about 11 months after the end of the calendar year. Worker and case characteristics are published approximately 14 months after the end of the calendar year. Unlike the fatality census, the self-employed, government workers, and workers on small farms are excluded from the scope of the survey of nonfatal injuries. These differences may affect comparisons of data for fatal and nonfatal workplace events.

Background

At the outset of the redesign of the occupational safety and health statistics program in 1989, BLS chartered a classification structures team to review and revise the coding system it had been using to classify

workers' compensation data collected under the Supplementary Data System. The team consisted of BLS staff, as well as safety and health experts from other Federal and participating State agencies. In anticipation of the new data requirements for occupational injuries and illnesses and because of increased demand by users for more detailed information, the team recognized that a new, comprehensive, detailed coding scheme would be needed.

After research and testing, the team recommended definitions, rules of selection, numerical codes, and code descriptions for nature of injury or illness; part of body affected; source of injury or illness; event or exposure (previously known as "type of accident or exposure"); and a classification termed secondary source of injury or illness. The Standard Industrial Classification (SIC), 1987 version, would continue to be used for industry, and a modified version of the Bureau of Census 1990 Occupational Classification System would be used to code workers' occupations. Starting with 1992 occupational injury and illness data collection, the new classification structures were implemented by BLS and participating State agencies.

After BLS had implemented OIICS, the ANSI Z16.2 subcommittee, independently of BLS, initiated steps to consider the new system as the national standard. In February 1995, the ANSI Z16.2 subcommittee submitted the Occupational Injury and Illness Classification System (nature, part, source, event, secondary source, SIC industry, and occupation) to its membership for consideration. The membership voted to adopt the BLS system for recording information on occupational injuries and illnesses. Then, on September 11, 1995, the ANSI Board of Standards Review approved the OIICS as the American National

Standard for Information Management for Occupational Safety and Health (ANSI Z16.2-1995).⁷

A number of other organizations have either adopted the BLS system or are considering adopting it. The Environmental Protection Agency has adopted the OIICS and has already developed an automated system using it to categorize on-the-job injuries and illnesses affecting its employees. The system is expected to be available on CD-Rom and via the Internet later this year. In addition, many State workers' compensation agencies as well as the Canadian Association of Workers' Compensation Boards have adopted the OIICS. The International Labour Organization is also considering it.

Summary

The BLS Occupational Injury and Illness Classification System will enable safety and health professionals and other data users to better monitor work injuries and illnesses, educate workers about hazards associated with various jobs, promote safer work practices through enhanced job safety training, develop new safety equipment, assess and improve workplace safety standards, target research, and better use scarce resources. To evaluate their own programs, employers, unions, and industry groups will be able to more readily compare their own safety and health experiences with national trends.

As with any major statistical system revision, experience will point to areas where fine-tuning will be needed. Such enhancements are essential to maintain a high quality classification system. The agencies involved in developing the Occupational Injury and Illness Classification System will continue to devote resources to improving the system to assure it continues to serve the purposes for which it was created.

—ENDNOTES—

¹ *Occupational Injury and Illness Classification Manual*, Bureau of Labor Statistics, December 1992. Unpublished document. The text of the Manual is in the Internet World Wide Web (<http://www.bls.gov/oshhome.htm>).

² *Method of Recording Basic Facts Relating to the Nature and Occurrence of Work Injuries*, American National Standards Institute, ANSI Z16.2-1962, revised 1969. (Out of print.)

³ See *The International Classification of Diseases, 9th Revision, Clinical Modification*, Public Health Service, Department of Health and Human Services, 1989.

⁴ Office of Management and Budget, *Standard Industrial Classification Manual*, 1987.

⁵ *Alphabetical Index of Industries and Occupations*, Bureau of the Census, Department of

Commerce, 1990. According to this coding scheme some occupations are coded differently depending on the industry of the employer. Industry codes listed in the alphabetical index used to code occupations are based on the Census industry classification, not the SIC system used in BLS occupational safety and health programs. BLS modified the alphabetic index to reflect SIC rather than Census industry code links. The occupation codes and their associated titles have not been modified.

⁶ See the Census of Fatal Occupational Injuries and the Survey of Occupational Injuries and Illnesses news releases: USDL-95-288; USDL-95-142; USDL-95-508.

⁷ "Notification of Approval of Standard," Board of Standards Review, American National Standards Institute, New York, September 20, 1995.

The American National Standards Institute (ANSI) is a federation of manufacturers, trade associations, technical societies, professional groups, and consumer organizations that coordinates efforts to create universal nationally-accepted business and technical standards. Since 1918, ANSI has adopted over 4,000 standards covering various items from thread pitches for screws, nuts, and bolts to computer specifications.

ANSI functions through committees that specialize in a particular field. Job safety and health matters, for example, are handled by the Z16 Committee, sponsored by the National Safety Council. The Z16.2 Subcommittee handles matters relating to the recording of information on occupational injuries and illnesses and was responsible for reviewing the BLS-developed system and recommending its adoption.

Table 1. Fatal occupational injuries by industry and major event or exposure, 1994

| Industry ¹ | SIC code ¹ | Number | Event or exposure ² (percent) | | | | | | |
|--|-----------------------|--------|---|--------------------------|---------------------------|------------------------------------|-------|--|----------------------|
| | | | Percent | Transportation incidents | Assaults and violent acts | Contact with objects and equipment | Falls | Exposure to harmful substances or environments | Fires and explosions |
| Total | | 6,588 | 100.0 | 41.6 | 19.9 | 15.4 | 10.0 | 9.7 | 3.1 |
| Private industry | | 5,923 | 100.0 | 40.5 | 19.7 | 16.4 | 10.4 | 10.1 | 2.7 |
| Agriculture, forestry and fishing | | 847 | 100.0 | 53.7 | 6.6 | 19.8 | 7.2 | 11.3 | .9 |
| Mining | | 180 | 100.0 | 31.1 | - | 33.9 | 6.1 | 15.0 | 11.7 |
| Construction | | 1,027 | 100.0 | 25.8 | 2.7 | 17.8 | 32.1 | 17.9 | 3.3 |
| General building contractors | 15 | 189 | 100.0 | 22.2 | 5.3 | 15.9 | 41.8 | 12.2 | 2.6 |
| Residential building construction | 152 | 82 | 100.0 | 22.0 | 9.8 | 18.3 | 32.9 | 15.9 | - |
| Single-family housing construction | 1521 | 50 | 100.0 | 18.0 | 12.0 | 20.0 | 32.0 | 18.0 | - |
| Residential construction, n.e.c. | 1522 | 19 | 100.0 | - | - | 26.3 | 26.3 | - | - |
| Nonresidential building construction | 154 | 96 | 100.0 | 20.8 | - | 14.6 | 47.9 | 10.4 | 4.2 |
| Industrial buildings and warehouses | 1541 | 37 | 100.0 | 10.8 | - | 16.2 | 45.9 | 13.5 | 10.8 |
| Nonresidential building construction, n.e.c. | 1542 | 48 | 100.0 | 29.2 | - | 16.7 | 45.8 | 8.3 | - |
| Heavy construction, except building | 16 | 247 | 100.0 | 41.3 | - | 21.1 | 8.1 | 24.3 | 3.6 |
| Highway and street construction | 161 | 76 | 100.0 | 65.8 | - | 6.6 | - | 13.2 | 7.9 |
| Heavy construction, except highway | 162 | 166 | 100.0 | 29.5 | - | 27.1 | 10.2 | 30.1 | - |
| Bridge, tunnel, and elevated highway | 1622 | 20 | 100.0 | 55.0 | - | - | 25.0 | - | - |
| Water, sewer, and utility lines | 1623 | 90 | 100.0 | 18.9 | - | 28.9 | 11.1 | 38.9 | - |
| Heavy construction, n.e.c. | 1629 | 56 | 100.0 | 37.5 | - | 28.6 | - | 25.0 | - |
| Special trades contractors | 17 | 591 | 100.0 | 20.5 | 2.5 | 17.1 | 39.1 | 17.1 | 3.4 |
| Plumbing, heating and air-conditioning | 171 | 71 | 100.0 | 29.6 | 5.6 | 22.5 | 23.9 | 14.1 | - |
| Painting and paper hanging | 172 | 40 | 100.0 | 12.5 | - | - | 62.5 | 15.0 | - |
| Electrical work | 173 | 78 | 100.0 | 15.4 | 5.1 | 7.7 | 23.1 | 46.2 | - |
| Masonry, stonework, tile setting, and plastering | 174 | 53 | 100.0 | 34.0 | - | - | 52.8 | 7.5 | - |
| Masonry and other stonework | 1741 | 15 | 100.0 | - | - | - | 73.3 | - | - |
| Plastering, drywall, and insulation | 1742 | 26 | 100.0 | 34.6 | - | - | 53.8 | - | - |
| Terrazzo, tile, marble, mosaic work | 1743 | 10 | 100.0 | 80.0 | - | - | - | - | - |
| Carpentry and floor work | 175 | 31 | 100.0 | 22.6 | - | - | 54.8 | 16.1 | - |
| Carpentry work | 1751 | 28 | 100.0 | 21.4 | - | - | 57.1 | 17.9 | - |
| Roofing, siding, and sheet metal work | 176 | 89 | 100.0 | 9.0 | - | 5.6 | 67.4 | 14.6 | - |
| Concrete work | 177 | 34 | 100.0 | 26.5 | - | 35.3 | 11.8 | 14.7 | - |
| Water well drilling | 178 | 8 | 100.0 | - | - | - | - | 62.5 | - |
| Miscellaneous special trade contractors | 179 | 182 | 100.0 | 19.8 | - | 30.8 | 32.4 | 9.3 | 5.5 |
| Structural steel erection | 1791 | 52 | 100.0 | 11.5 | - | 11.5 | 69.2 | - | - |
| Excavation work | 1794 | 47 | 100.0 | 36.2 | - | 53.2 | - | - | - |
| Wrecking and demolition work | 1795 | 22 | 100.0 | - | - | 50.0 | 36.4 | - | - |
| Installing building equipment, n.e.c. | 1796 | 12 | 100.0 | - | - | - | 33.3 | - | - |
| Special trade contractors, n.e.c. | 1799 | 46 | 100.0 | 19.6 | - | 23.9 | 15.2 | 23.9 | 13.0 |
| Manufacturing | | 787 | 100.0 | 31.3 | 7.0 | 38.6 | 6.6 | 10.3 | 5.6 |
| Transportation and public utilities | | 944 | 100.0 | 67.4 | 13.8 | 8.7 | 3.0 | 6.2 | .7 |
| Wholesale trade | | 269 | 100.0 | 50.6 | 9.7 | 20.4 | 8.2 | 7.4 | 3.7 |
| Retail trade | | 797 | 100.0 | 18.8 | 69.9 | 4.4 | 2.9 | 2.6 | 1.4 |
| Finance, insurance, and real estate | | 112 | 100.0 | 39.3 | 36.6 | 5.4 | 8.0 | 8.9 | - |
| Services | | 844 | 100.0 | 41.9 | 29.5 | 7.1 | 9.0 | 10.0 | 2.4 |
| Other or nonclassifiable | | 116 | 100.0 | 49.1 | 20.7 | 12.9 | - | 12.1 | - |
| Government | | 665 | 100.0 | 51.3 | 20.9 | 6.9 | 7.1 | 6.3 | 6.5 |
| Federal | | 209 | 100.0 | 59.3 | 11.5 | 7.2 | 5.7 | 5.7 | 10.5 |
| State | | 112 | 100.0 | 66.1 | 18.8 | - | 8.0 | 4.5 | - |
| Local | | 333 | 100.0 | 41.4 | 27.9 | 8.1 | 7.2 | 7.2 | 6.0 |
| Police protection | 9221 | 121 | 100.0 | 42.1 | 54.5 | - | - | - | - |

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.

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: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1994.

NOTE: Totals for major categories may include subcategories not shown

Table 2. Fatal occupational injuries in the construction industry by event or exposure, 1994

| Event or exposure ¹ | Total fatalities (number) | Construction industry (percent) | | |
|--|---------------------------|---------------------------------|--------------------|---------------------------|
| | | General building contractors | Heavy construction | Special trade contractors |
| Total | 1,027 | 100.0 | 100.0 | 100.0 |
| Transportation incidents | 265 | 22.2 | 41.3 | 20.5 |
| Highway | 129 | 13.8 | 13.8 | 11.7 |
| Collision between vehicles, mobile equipment | 63 | 7.9 | 4.5 | 6.3 |
| Moving in same direction | 10 | — | 1.6 | .8 |
| Moving in opposite directions, oncoming | 19 | 2.6 | — | 2.0 |
| Moving in intersection | 11 | 1.6 | 1.6 | .7 |
| Vehicle struck stationary object or equipment on side of road | 22 | 1.6 | 1.6 | 2.5 |
| Noncollision | 43 | 3.7 | 7.7 | 2.9 |
| Jack-knifed or overturned—no collision | 34 | 2.6 | 6.9 | 2.0 |
| Nonhighway (farm, industrial premises) | 44 | — | 8.1 | 3.7 |
| Collision between vehicles or mobile equipment | 5 | — | — | .5 |
| Noncollision accident | 38 | — | 7.3 | 3.0 |
| Fall from moving vehicle, mobile equipment | 5 | — | — | .7 |
| Fell from and struck by vehicle, mobile equipment | 9 | — | 2.4 | — |
| Overturned | 21 | — | 4.5 | 1.5 |
| Aircraft | 10 | 2.6 | — | .7 |
| Worker struck by vehicle, mobile equipment | 69 | 4.2 | 17.0 | 3.2 |
| Worker struck by vehicle, mobile equipment in roadway | 32 | — | 10.1 | .8 |
| Worker struck by vehicle, mobile equipment on side of road | 9 | — | 2.0 | .5 |
| Worker struck by vehicle, mobile equipment in parking lot or non-road area | 20 | 2.1 | 2.8 | 1.5 |
| Water vehicle | 6 | — | 1.6 | — |
| Assaults and violent acts | 28 | 5.3 | 1.2 | 2.5 |
| Homicides | 15 | 4.2 | — | .8 |
| Shooting | 13 | 3.7 | — | .7 |
| Self-inflicted injury | 12 | — | — | 1.5 |
| Contact with objects and equipment | 183 | 15.9 | 21.1 | 17.1 |
| Struck by object | 86 | 7.4 | 11.3 | 7.4 |
| Struck by falling object | 54 | 4.8 | 7.3 | 4.6 |
| Struck by flying object | 7 | — | 1.6 | — |
| Struck by swinging or slipping object | 11 | — | — | 1.5 |
| Struck by rolling, sliding objects on floor or ground level | 6 | — | — | .7 |
| Caught in or compressed by equipment or objects | 33 | 3.2 | 2.8 | 3.4 |
| Caught in running equipment or machinery | 11 | 1.6 | — | 1.2 |
| Compressed or pinched by rolling, sliding, or shifting objects | 8 | — | 1.2 | .7 |
| Caught in or crushed in collapsing materials | 63 | 4.8 | 6.9 | 6.3 |
| Excavation or trenching cave-in | 39 | 1.6 | 6.1 | 3.6 |
| Caught in or crushed in collapsing structure | 21 | 2.6 | — | 2.4 |
| Falls | 330 | 41.8 | 8.1 | 39.1 |
| Fall to lower level | 316 | 38.1 | 7.3 | 38.2 |
| Fall from floor, dock, or ground level | 11 | 1.6 | — | 1.4 |
| Fall from ladder | 47 | 7.9 | 1.2 | 4.9 |
| Fall from roof | 106 | 11.6 | — | 13.9 |
| Fall from scaffold, staging | 68 | 9.0 | — | 8.5 |
| Fall from building girders or other structural steel | 25 | 2.1 | 1.6 | 2.9 |
| Fall from nonmoving vehicle | 9 | — | — | 1.2 |
| Fall on same level | 10 | 3.2 | — | — |
| Exposure to harmful substances or environments | 184 | 12.2 | 24.3 | 17.1 |
| Contact with electric current | 140 | 9.5 | 15.4 | 14.2 |
| Contact with electric current of machine, tool, appliance, light fixture | 13 | — | — | 1.7 |
| Contact with wiring, transformers, or other electrical component | 45 | 2.6 | 3.6 | 5.2 |
| Contact with overhead power lines | 61 | 4.2 | 8.9 | 5.2 |
| Contact with temperature extremes | 13 | — | 2.8 | 1.0 |
| Exposure to environmental heat | 10 | — | 2.0 | .8 |
| Exposure to caustic, noxious, or allergenic substances | 15 | 1.6 | 2.4 | 1.0 |
| Inhalation of substance | 9 | — | 1.6 | .7 |
| Oxygen deficiency | 15 | — | 3.6 | .7 |
| Drowning, submersion | 9 | — | 2.4 | .5 |
| Fires and explosions | 34 | 2.6 | 3.6 | 3.4 |
| Fires—unintended or uncontrolled | 16 | — | 2.8 | 1.5 |
| Fire in residence, building, or other structure | 5 | — | 1.2 | — |
| Explosion | 18 | 2.6 | — | 1.9 |
| Explosion of pressure vessel or piping | 8 | — | — | 1.0 |

¹ 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, 1994.

Table 3. Fatal occupational injuries in the construction industry by occupation and major event or exposure, 1994

| Occupation ¹ | Number | Event or exposure ² (percent) | | | | | | |
|--|--------|---|--------------------------|---------------------------|------------------------------------|-------|--|----------------------|
| | | Percent | Transportation incidents | Assaults and violent acts | Contact with objects and equipment | Falls | Exposure to harmful substances or environments | Fires and explosions |
| Total | 1,027 | 100.0 | 25.8 | 2.7 | 17.8 | 32.1 | 17.9 | 3.3 |
| Managerial and professional specialty | 54 | 100.0 | 37.0 | - | 11.1 | 33.3 | 9.3 | - |
| Executive, administrative, and managerial | 51 | 100.0 | 37.3 | - | 11.8 | 33.3 | 9.8 | - |
| Managers and administrators, n.e.c. | 45 | 100.0 | 35.6 | - | 13.3 | 35.6 | - | - |
| Technical, sales, and administrative support | 10 | 100.0 | 60.0 | - | - | - | - | - |
| Technicians and related support occupations | 6 | 100.0 | 66.7 | - | - | - | - | - |
| Precision production, craft, and repair | 557 | 100.0 | 16.7 | 3.1 | 13.8 | 41.1 | 22.4 | 2.3 |
| Mechanics and repairers | 46 | 100.0 | 26.1 | - | 23.9 | 28.3 | 15.2 | - |
| Vehicle and mobile equipment mechanics, repairers, and supervisors | 14 | 100.0 | 35.7 | - | 28.6 | 28.6 | - | - |
| Electrical and electronic equipment repairers | 12 | 100.0 | - | - | - | - | 33.3 | - |
| Miscellaneous mechanics and repairers | 16 | 100.0 | - | - | 25.0 | 37.5 | - | - |
| Elevator installers and repairers | 7 | 100.0 | - | - | - | 71.4 | - | - |
| Construction trades | 499 | 100.0 | 18.0 | 3.2 | 13.2 | 41.9 | 22.8 | 2.4 |
| Supervisors, construction occupations | 100 | 100.0 | 29.0 | 6.0 | 22.0 | 24.0 | 17.0 | - |
| Supervisors, carpenters and related workers | 5 | 100.0 | - | - | - | 80.0 | - | - |
| Supervisors, n.e.c. | 78 | 100.0 | 30.8 | 6.4 | 24.4 | 16.7 | 19.2 | - |
| Construction trades, except supervisors | 399 | 100.0 | 12.8 | 2.5 | 11.0 | 46.4 | 24.3 | 2.5 |
| Brickmasons, stonemasons, and apprentices | 11 | 100.0 | - | - | - | 54.5 | - | - |
| Carpenters and apprentices | 77 | 100.0 | 9.1 | - | 18.2 | 51.9 | 18.2 | - |
| Drywall installers | 9 | 100.0 | - | - | - | 55.6 | - | - |
| Electricians and apprentices | 67 | 100.0 | 11.9 | - | - | 20.9 | 59.7 | - |
| Electrical power installers and repairers | 16 | 100.0 | - | - | - | 50.0 | 50.0 | - |
| Painters, construction and maintenance | 32 | 100.0 | - | - | - | 59.4 | 25.0 | - |
| Plumbers, pipefitters, steamfitters, and apprentices | 33 | 100.0 | 24.2 | - | 27.3 | 18.2 | - | 12.1 |
| Insulation workers | 6 | 100.0 | - | - | - | 66.7 | - | - |
| Roofers | 53 | 100.0 | 9.4 | - | - | 71.7 | 9.4 | - |
| Structural metal workers | 45 | 100.0 | 8.9 | - | 15.6 | 64.4 | - | - |
| Drillers, earth | 7 | 100.0 | - | - | - | - | 71.4 | - |
| Precision production occupations | 11 | 100.0 | - | - | - | 63.6 | - | - |
| Precision metal working occupations | 11 | 100.0 | - | - | - | 63.6 | - | - |
| Sheet metal workers | 5 | 100.0 | - | - | - | 80.0 | - | - |
| Operators, fabricators, and laborers | 400 | 100.0 | 38.2 | 1.5 | 24.2 | 20.0 | 13.2 | 4.8 |
| Machine operators, assemblers, and inspectors | 26 | 100.0 | - | - | 23.1 | 26.9 | 19.2 | 19.2 |
| Fabricators, assemblers, and hand working occupations | 22 | 100.0 | - | - | 27.3 | 27.3 | 18.2 | 22.7 |
| Welders and cutters | 21 | 100.0 | - | - | 28.6 | 23.8 | 19.0 | 23.8 |
| Transportation and material moving occupations | 124 | 100.0 | 58.1 | - | 26.6 | - | 5.6 | 5.6 |
| Motor vehicle operators | 50 | 100.0 | 76.0 | - | 14.0 | - | - | - |
| Truck drivers | 49 | 100.0 | 75.5 | - | 14.3 | - | - | - |
| Material moving equipment operators | 70 | 100.0 | 45.7 | - | 35.7 | - | - | 10.0 |
| Operating engineers | 29 | 100.0 | 44.8 | - | 34.5 | - | - | - |
| Excavating and loading machine operators | 17 | 100.0 | 41.2 | - | 52.9 | - | - | - |
| Grader, dozer, and scraper operators | 15 | 100.0 | 46.7 | - | - | - | - | - |
| Industrial truck and tractor equipment operators | 4 | 100.0 | 100.0 | - | - | - | - | - |
| Handlers, equipment cleaners, helpers, and laborers | 250 | 100.0 | 28.0 | 1.6 | 23.2 | 28.0 | 16.4 | 2.8 |
| Helpers, construction and extractive occupations | 16 | 100.0 | 37.5 | - | - | 37.5 | - | - |
| Helpers, construction trades | 16 | 100.0 | 37.5 | - | - | 37.5 | - | - |
| Construction laborers | 231 | 100.0 | 27.3 | 1.7 | 23.4 | 27.7 | 16.9 | 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. 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. n.e.c. = not elsewhere classified.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with State and Federal agencies, Census of Fatal Occupational Injuries, 1994.

Table 4. Number of nonfatal occupational injuries and illnesses involving days away from work¹ by selected worker and case characteristic and occupation, 1993

| Characteristic | All occupations | Construction laborers | |
|--|-----------------|-----------------------|---------|
| | | Number | Percent |
| Total | 2,252,591 | 54,579 | 100.0 |
| Sex: | | | |
| Men | 1,490,418 | 52,864 | 96.9 |
| Women | 735,570 | 1,325 | 2.4 |
| Age: | | | |
| Under 14 years | 23 | — | — |
| 14 to 15 years | 889 | 22 | 0.0 |
| 16 to 19 years | 95,791 | 3,068 | 5.6 |
| 20 to 24 years | 319,708 | 10,922 | 20.0 |
| 25 to 34 years | 724,355 | 20,994 | 38.5 |
| 35 to 44 years | 566,429 | 11,695 | 21.4 |
| 45 to 54 years | 323,503 | 4,372 | 8.0 |
| 55 to 64 years | 148,249 | 1,524 | 2.8 |
| 65 years and over | 21,604 | 167 | 0.3 |
| Length of service with employer: | | | |
| Less than 3 months | 278,692 | 16,859 | 30.9 |
| 3 months to 11 months | 410,126 | 13,508 | 24.7 |
| 1 year to 4 years | 754,874 | 14,800 | 27.1 |
| 5 years or more | 598,044 | 5,916 | 10.8 |
| Not reported | 210,855 | 3,496 | 6.4 |
| Race or ethnic origin: | | | |
| White, non-Hispanic | 1,250,071 | 32,872 | 60.2 |
| Black, non-Hispanic | 195,780 | 5,170 | 9.5 |
| Hispanic | 192,304 | 7,117 | 13.0 |
| Asian or Pacific Islander | 33,230 | 384 | 0.7 |
| Amer. Indian or Alaskan Native | 9,156 | 517 | 0.9 |
| Not reported | 572,051 | 8,520 | 15.6 |
| Major industry division: | | | |
| Agriculture, forestry, and fishing ² | 44,826 | 19 | 0.0 |
| Mining ³ | 21,090 | — | — |
| Construction | 204,769 | 53,060 | 97.2 |
| Manufacturing | 583,841 | 103 | 0.2 |
| Transportation and public utilities ³ | 232,999 | 369 | 0.7 |
| Wholesale trade | 180,934 | 63 | 0.1 |
| Retail trade | 408,590 | 53 | 0.0 |
| Finance, insurance, and real estate | 60,159 | 71 | 0.1 |
| Services | 535,386 | 841 | 1.5 |
| Number of days away from work: | | | |
| Cases involving 1 day | 366,054 | 8,045 | 14.7 |
| Cases involving 2 days | 291,760 | 6,772 | 12.4 |
| Cases involving 3-5 days | 467,001 | 10,545 | 19.3 |
| Cases involving 6-10 days | 301,941 | 6,811 | 12.5 |
| Cases involving 11-20 days | 256,319 | 5,785 | 10.6 |
| Cases involving 21-30 days | 142,301 | 4,102 | 7.5 |
| Cases involving 31 or more days | 427,215 | 12,520 | 22.9 |
| Median days away from work | 6 | 7 | |
| Nature of injury, illness: | | | |
| Sprains, strains | 959,163 | 20,322 | 37.2 |
| Fractures | 136,478 | 5,468 | 10.0 |
| Cuts, lacerations, punctures | 202,464 | 6,570 | 12.0 |
| Bruises, contusions | 211,179 | 4,930 | 9.0 |
| Heat burns | 37,718 | 654 | 1.2 |
| Chemical burns | 15,667 | 641 | 1.2 |
| Amputations | 11,342 | 285 | 0.5 |
| Carpal tunnel syndrome | 41,019 | 229 | 0.4 |
| Tendonitis | 25,026 | 243 | 0.4 |
| Multiple injuries | 73,181 | 1,965 | 3.6 |
| With fractures | 13,379 | 469 | 0.9 |
| With sprains | 26,969 | 666 | 1.2 |
| Soreness, Pain | 127,555 | 2,419 | 4.4 |
| Back pain | 58,385 | 1,163 | 2.1 |
| All other | 411,799 | 10,856 | 19.9 |

See footnotes at end of table

Table 4. Number of nonfatal occupational injuries and illnesses involving days away from work¹ by selected worker and case characteristic and occupation, 1993—Continued

| Characteristic | All occupations | Construction laborers | |
|---|-----------------|-----------------------|---------|
| | | Number | Percent |
| Part of body affected: | | | |
| Head | 155,504 | 5,003 | 9.2 |
| Eye | 88,329 | 3,179 | 5.8 |
| Neck | 40,704 | 809 | 1.5 |
| Trunk | 869,447 | 19,425 | 35.6 |
| Back | 615,010 | 13,718 | 25.1 |
| Shoulder | 105,881 | 1,931 | 3.5 |
| Upper extremities | 518,703 | 10,938 | 20.0 |
| Finger | 192,634 | 4,309 | 7.9 |
| Hand, except finger | 92,405 | 2,074 | 3.8 |
| Wrist | 114,540 | 1,756 | 3.2 |
| Lower extremities | 440,018 | 13,691 | 25.1 |
| Knee | 144,693 | 3,518 | 6.4 |
| Foot, toe | 114,814 | 4,379 | 8.0 |
| Body systems | 32,005 | 600 | 1.1 |
| Multiple | 177,205 | 3,640 | 6.7 |
| All other | 19,007 | 473 | 0.9 |
| Source of injury, illness: | | | |
| Chemicals, chemical products | 43,411 | 1,086 | 2.0 |
| Containers | 330,285 | 3,196 | 5.9 |
| Furniture, fixtures | 88,813 | 824 | 1.1 |
| Machinery | 154,083 | 3,504 | 6.4 |
| Parts and materials | 249,077 | 14,508 | 26.6 |
| Worker motion or position | 331,994 | 5,385 | 9.9 |
| Floor, ground surfaces | 340,159 | 8,262 | 15.1 |
| Handtools | 105,478 | 5,538 | 10.1 |
| Vehicles | 157,360 | 2,822 | 5.2 |
| Health care patient | 99,390 | — | — |
| All other | 352,542 | 9,654 | 17.7 |
| Event or exposure: | | | |
| Contact with object, equipment | 614,630 | 20,781 | 38.1 |
| Struck by object | 294,177 | 11,437 | 21.0 |
| Struck against object | 181,753 | 4,375 | 8.0 |
| Caught in object, equipment, material | 98,848 | 2,513 | 4.6 |
| Fall to lower level | 111,266 | 4,771 | 8.7 |
| Fall on same level | 244,115 | 4,116 | 7.5 |
| Slips, trips | 83,078 | 1,750 | 3.2 |
| Overexertion | 635,802 | 12,569 | 23.0 |
| Overexertion in lifting | 380,418 | 7,273 | 13.3 |
| Repetitive motion | 94,309 | 688 | 1.3 |
| Exposed to harmful substance | 111,524 | 2,654 | 4.9 |
| Transportation accidents | 71,336 | 1,523 | 2.8 |
| Fires, explosions | 4,794 | 189 | 0.3 |
| Assault, violent act | 26,906 | 123 | 0.2 |
| by person | 21,254 | 48 | 0.0 |
| by other | 5,653 | 75 | 0.1 |
| All other | 254,833 | 5,416 | 9.9 |

¹ Days away from work include those which result in days away from work with or without restricted work activity.

² Excludes farms with fewer than 11 employees.

³ Data conforming to OSHA definitions for mining operators in coal, metal, and nonmetal mining and for employees in railroad transportation are provided to BLS by the Mine Safety and Health Administration, U.S. Department of Labor; and the Federal Railroad Administration, U.S. Department of Transportation.

Independent mining contractors are excluded from the coal, metal, and nonmetal mining industries.

NOTE: Because of rounding and data exclusion of nonclassifiable responses, data may not sum to the totals. Dashes indicate data that do not meet publication guidelines.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor April 1996.