

Occupational safety and health

Occupational safety and health statistics: new data for a new century

Changes in classification systems covering industries, occupations, race/ethnicity, and geographic areas, along with changes to definitions and emerging medical conditions, result in new data on occupational safety and health

William J. Wiatrowski

At the beginning of the 21st century, there are new ways of categorizing populations—a new industry classification structure, a new occupation classification structure, new race and ethnicity categories, and new definitions of geographic areas. The Bureau of Labor Statistics is adopting these new and revised classification systems throughout its programs, including the occupational safety and health statistics program. Data on occupational injuries, illnesses, and fatalities for 2003 and beyond are based on these new systems. In addition, changes to definitions used by employers to record injuries and illnesses, and the identification of new or emerging injuries and illnesses, result in occupational safety and health data that are different from the past. These new data help to illuminate the safety and health picture of special populations, many of which are described more precisely under the new classification systems.

If one were trying to understand a workplace injury in 1905, he or she might learn the following:

- Worker was employed on a farm
- Worker's occupation was "agricultural pursuits"
- Worker was classified in the 1900 Census into one of three race categories: black, white, mulatto
- Worker's job was located in Concord, New Hampshire, which is in Merrimack County

Moving ahead 100 years, the workplace injury in 2005 might have the following characteristics:

- Worker is employed in the Web search portal industry
- Worker's occupation is a database administrator
- Worker is identified as being of multiple races
- Worker's job is located in Concord, New Hampshire, in the Boston-Worcester-Manchester Combined Metropolitan Area

Over 100 years, both industries and occupations have changed, and the new classifications allow more specificity. Race and ethnicity may not have changed, but the descriptions used for categorization are different and provide more detail.

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This issue of the *Monthly Labor Review* discusses occupational safety and health issues among special populations— younger workers, older workers, female workers, farming workers, Asian workers, and Hispanic workers. Some articles are based on papers presented at the Maine Occupational Research Agenda symposium on occupational safety and health issues among special populations. The symposium was held in May 2005.

Similarly, geographic areas have not changed, but the location of the U.S. population has shifted, and metropolitan areas have expanded. This analysis explores the changes that have taken place in each of these classification systems, and identifies how the new systems are used to describe occupational safety and health data.

Data on occupational safety and health come from several sources within BLS. Work-related nonfatal injuries and illnesses are obtained from the BLS annual Survey of Occupational Injuries and Illnesses, which provides summary data on the number and rate of injury and illness by detailed industry. For those injuries and illnesses that require the employee to be away from work for at least 1 day, the survey also provides information on worker demographics and the circumstances surrounding the incident. A complete census of workplace fatalities is available from the BLS Census of Fatal Occupational Injuries, which uses multiple source documents to amass a comprehensive database of fatal injuries, including demographics of the decedent, employer classifications, and information about the incident that led to the fatality. Finally, BLS has conducted special studies on occupational safety and health issues, including respirator use and practices and an upcoming study of employer workplace violence policies.¹

Industry classifications

The Standard Industrial Classification (SIC) system was introduced in 1939 in an effort to create a single system for identifying and classifying economic activity. The basis for classification was type of economic activity—that is, what work is performed at the establishment. While the SIC was updated periodically to keep up with the changing U.S. economy—the last time in 1987—there were growing concerns that the concepts and structure of the system were becoming outdated. The passage of the North American Free Trade Agreement in 1993, and the subsequent need for consistent classification across the United States, Canada, and Mexico, led to the development of a completely new system—the North American Industry Classification System (NAICS).²

NAICS was introduced in 1997 and has since been revised in 2002. The basis for classification is production processes. This change in the basic concept of the classification system led to the reclassification of many business establishments. For example, under SIC, the headquarters, plant, and warehouse of an automobile manufacturer might all be classified under motor vehicle manufacturing, depending upon their location and the availability of separate data for each activity. Under NAICS, each is classified by the separate activity they perform (in this case, management, manufacturing, and warehousing).

NAICS recognizes the development of many new industries spurred by the growth of technology. Under the SIC system, *computer programming, data processing, and other computer related services* (such as Internet service providers or Web search portals) was classified under Business Services, along with advertising, office cleaning, and guard services. Under the NAICS system, the major category for computer systems development-related activities is *computer systems design and related services*, which is classified under Professional, scientific, and technical services. There is also a separate category for *Internet service providers, web search portals, and data processing services*. It is classified under the Information sector, along with publishing, motion pictures, and broadcasting. The services provided by the industries in the Information sector include processing data and transforming information into commodities that are produced and distributed.

An example of the new NAICS data in the BLS occupational safety and health statistics program is the number and rate of total recordable injuries and illnesses, which are available by detailed industry. Among the published statistics is a list of those individual industries with at least 100,000 injury and illness cases in the year. The switch from SIC to NAICS resulted in a number of changes to the list. For example, eating and drinking places were frequently near the top of the list of industries with high numbers of injuries and illnesses under SIC; in 2002, such establishments were second (with 252,000 cases) behind hospitals (321,000 cases). Under NAICS, eating and drinking places are divided into several different industries, including full-service restaurants, limited-service eating places, and cafeterias. Because of this change, none of the individual restaurant classifications is among the 10 industries with the highest number of injuries and illnesses in 2003—although both full-service restaurants (119,000 cases) and limited-service eating places (112,000 cases) had more than 100,000 cases and combined would again be near the top of the list. (Hospitals head the list under NAICS as well, with 273,000 cases in 2003.) Table 1 provides data on the NAICS industries with the highest number of injuries and illnesses.

Occupation classifications

Unlike industry classifications, there was not one single occupational classification system that was used for all statistical reporting in the past. A variety of systems have been used since the early 1900s, most notably for capturing decennial Census data. (Some rudimentary occupational classification systems existed in the late 19th century. See exhibit 1 for an example from Massachusetts.) The first version of the Standard Occupational Classification (SOC) system was introduced in 1977. Occupations were classified by industry, similarity of work, and skill.

Table 1. Number of cases and incidence rate of nonfatal occupational injuries and illnesses for industries with 100,000 or more cases, private industry, 2003

Industry	Total cases (in thousands)	Incidence rate
Hospitals	292.7	8.7
Nursing and residential care facilities	221.5	10.1
Transportation equipment manufacturing	162.1	9.3
General merchandise stores	150.6	7.2
Administrative and support services	137.3	3.7
Food manufacturing	129.1	8.6
Grocery stores	126.3	7.2
Fabricated metal product manufacturing	123.5	8.5
Ambulatory health care services	122.4	3.3
Merchant wholesalers, durable goods	121.7	4.3
Full-service restaurants	119.3	4.5
Building equipment contractors	118.3	7.1
Limited-service eating places	112.5	4.9
Merchant wholesalers, nondurable goods	108.9	5.7

NOTE: The incidence rate represents the number of injuries and/or illnesses per 100 full-time workers, based on a full-time work schedule of 40 hours per week, 50 weeks per year.

Exhibit 1. Occupational categories from Massachusetts death certificates, 1875

- Cultivators of the earth
- Active mechanics abroad
- Active mechanics in shops
- Inactive mechanics in shops
- Laborers – no special trades
- Factors laboring abroad
- Employed on the ocean
- Merchants, financiers, agents, etc.
- Professional men
- Females

The Federal Government undertook a major revision to the SOC in the 1990s. More importantly, the revised SOC was designated the only occupational classification system to be used for future Government statistics. Thus, all programs are moving toward this new system.³ In the case of BLS occupational safety and health statistics data, occupations in the past were classified by the census occupational classification system. In some cases, specific occupations classified in the old and new systems are similar, while in other cases, more detail is provided under the new system. The SOC classifies occupations based on similarity of tasks at similar levels of work.

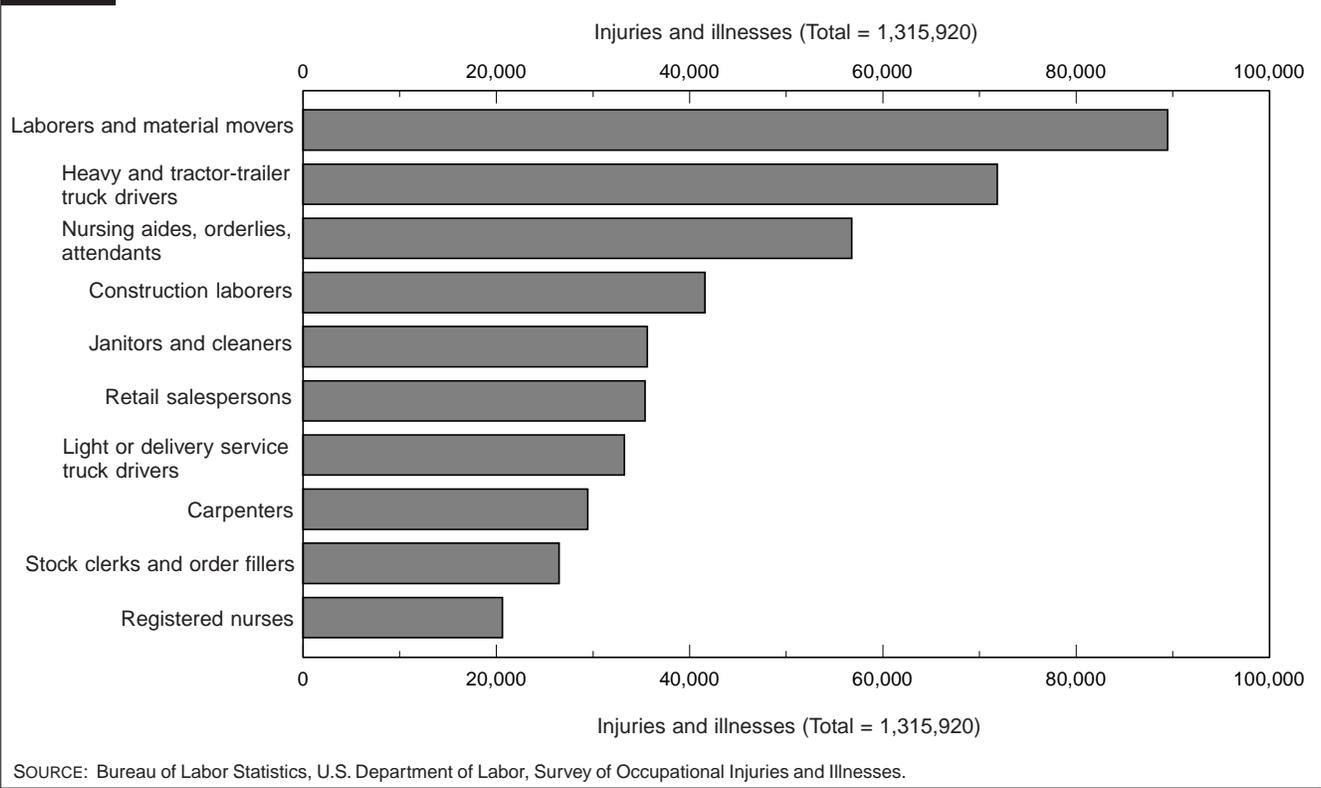
Certain health occupations provide an example of the changes introduced with the SOC. Under the census occupational classification system, health technologists and technicians were subdivided into a small number of specialties—lab techs, dental hygienists, medical records techs, radiology techs, and licensed practical nurses. These subcategories have been greatly expanded under the SOC. In addition to those listed above, newly-identified occupations include cardiovascular tech, diagnostic tech, nuclear medicine tech, sonographers, emergency tech, dietetic tech, psychiatric tech, respiratory tech, and surgical tech.

In the BLS Survey of Occupational Injuries and Illnesses, the new occupational classification system led to a change in the occupations published. For injuries and illnesses that involve days away from work, among the statistics published are the occupations with the greatest number of injuries and illnesses. For many years, the occupation that led the list was truck drivers, which included a wide variety of jobs covering local and long-distance driving. Under the SOC, the former truck-driver category is subdivided into three specific occupations: heavy and tractor-trailer truck driver, light or delivery service truck driver, and driver/sales worker. Because of this change, data for 2003 now show that heavy and tractor-trailer truck drivers have the largest share of total truck-driver injuries and illnesses. Further, none of these truck-driver categories leads the list of occupations with the most injuries and illnesses involving days away from work; that list is now led by laborers and material movers, which include a variety of nonconstruction jobs such as machine feeders, hand packers, and cleaners of vehicles. But while truck drivers no longer lead the list, the total of the three new truck-driver categories would in fact continue to lead the list. (See chart 1.)

Race and ethnicity classifications

The history of race and ethnicity classification in the United States reflects the Nation’s long struggle with issues of race, immigration, and related items. Race categories are generally revised in anticipation of each decennial census. The following is an example of some of the classifications used for the census and all Government statistics throughout the Nation’s history:

Chart 1. Occupations with the most injuries and illnesses with days away from work, 2003



- 1790 – Free whites; slaves
- 1820 – Free whites (except Indians not taxed); foreigners not naturalized; free colored persons; slaves
- 1850 – White; black; mulatto
- 1880 – White, black; mulatto; quadroon; octoroon
- 1950 – White; negro; American Indian; Hawaiian; Aleut; Eskimo
- 1970 – White; Asian Indian; Black or Negro
- 2000 – American Indian or Alaskan Native, Asian, Black or African American, Native Hawaiian or other Pacific Islander, White

In contrast to the substantial changes from 1790 to the mid-20th century, the changes that took place in 2000 were limited. The most important change was the ability to select more than one race category, and thus be designated as multiracial.⁴

Beginning in the 1960s, the Nation’s population classifications were expanded to include Spanish/Hispanic origin separately from race. Individuals could be identified as any race and, separately, could be identified as of Spanish/Hispanic origin. This led to a number of alternative means of tabulating race and Hispanic origin. Directives issued prior to the 2000 Census were designed to encourage the collection and tabulation of data that describe the intersection of data on

race and Hispanic origin. These directives result in such categories as “white, non-Hispanic,” “white, Hispanic,” “black, non-Hispanic,” and “black, Hispanic,” along with other combinations. Alternatively, Spanish/Hispanic origin can be collected and tabulated as a separate race category.

Race and Hispanic origin data are collected and tabulated both in the Survey of Occupational Injuries and Illnesses and the Census of Fatal Occupational Injuries. For injuries and illnesses involving days away from work, employers select one or more of the following categories to identify the worker:

- American Indian or Alaska Native
- Asian
- Black or African American
- Hispanic or Latino
- Native Hawaiian or Other Pacific Islander
- White

Because the injury and illness data are designed to mirror OSHA’s recordkeeping forms, forms that do not include race or ethnicity questions, answering these data is optional for the Survey of Occupational Injuries and Illnesses. Due to that fact, approximately 30 percent of data are unavailable. The opportunity to select more than one response allows for the tabulation of a multirace category.

In the fatality census, data are captured separately for race and Hispanic origin. In the case of race, the available choices are each of the individual race categories (American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, White) or a separate choice of “multiple races.” Hispanic origin is captured as a separate data element.

There has been a particular interest in workplace safety and health statistics regarding Hispanic workers, as that population has grown rapidly in recent years and many Hispanic workers are in fairly dangerous jobs. Chart 2 shows the number of fatalities among Hispanics in recent years, and indicates that the majority of the deaths have occurred among foreign-born Hispanics.

Geographic area

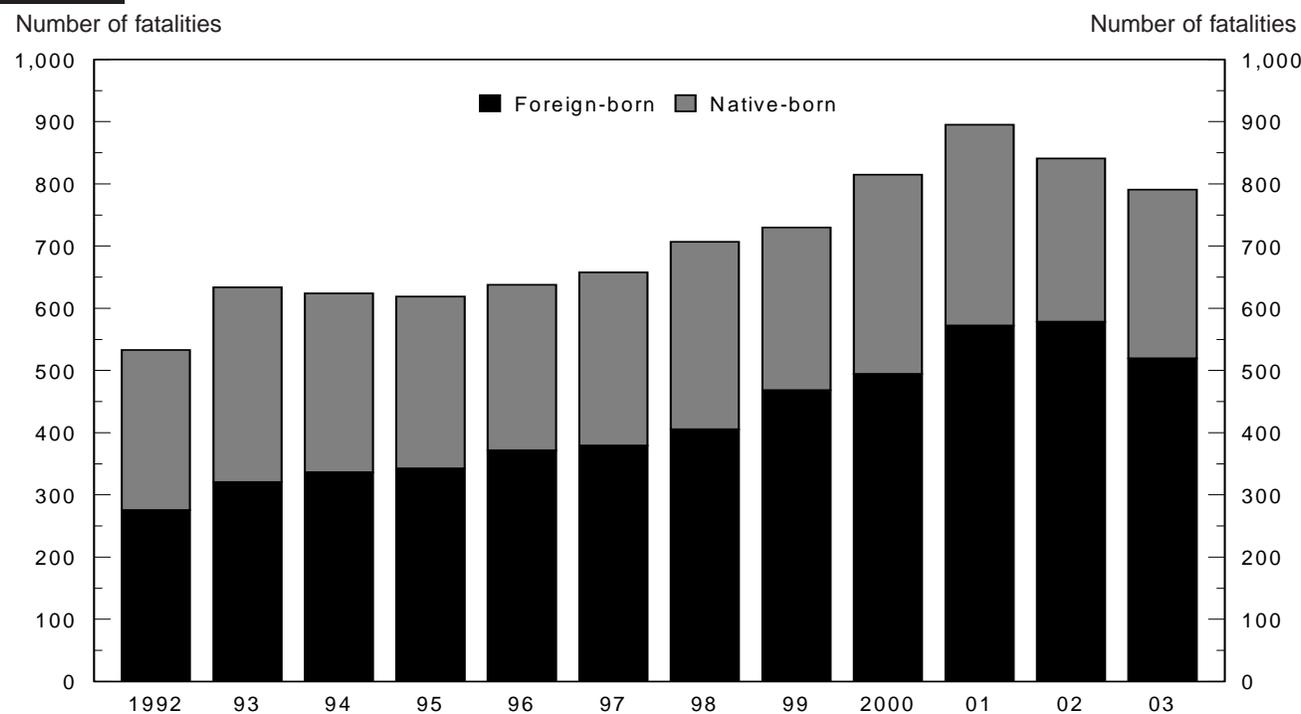
The U.S. system of States, counties, cities, and towns has been around since the Nation began; counties are more important in some parts of the country, while cities and towns have more prominence in most of New England. Metropolitan areas were first designated in the late 1940s, for use with the 1950 census. Metropolitan areas, at least when the designations first began, generally took into account central cities and the sur-

rounding area. Metropolitan area definitions are now redesignated every 10 years, using data gathered in each decennial census. The most recent designations were developed based on the 2000 census.⁵

Concord, New Hampshire, provides an example of changes that have occurred in the designation of metropolitan areas. Concord is the county seat of Merrimack County and the capital of New Hampshire. When the first metropolitan areas were defined, Concord was not part of any metropolitan area, and it stayed that way throughout the 20th century. Following the 2000 Census, Concord, together with all of Merrimack County, was designated the Concord micropolitan statistical area; micropolitan area is a new term representing smaller urban areas (population of 10,000 to 50,000) and their surrounding suburban areas. In addition, Concord is now part of the Boston-Worcester-Manchester-MA-NH Combined Statistical Area. Combined areas are defined as adjacent metropolitan and micropolitan areas that have employment interchange that meet certain criteria.

BLS tabulates workplace fatalities by metropolitan area. For example, in 2003 there were 198 fatalities in the New York metropolitan area, 139 in Chicago, 125 in Los Angeles, and 44 in Boston.⁶ (See charts 3 and 4.)

Chart 2. Number of fatal work injuries involving Hispanic or Latino workers, 1992–2003



NOTE: Data from 2001 exclude fatalities resulting from September 11 terrorist attacks.
 SOURCE: U.S. Department of Labor, Bureau of Labor Statistics, Census of Fatal Occupational Injuries, 2003.

Chart 3. Fatal occupational injuries by metropolitan area, 2003

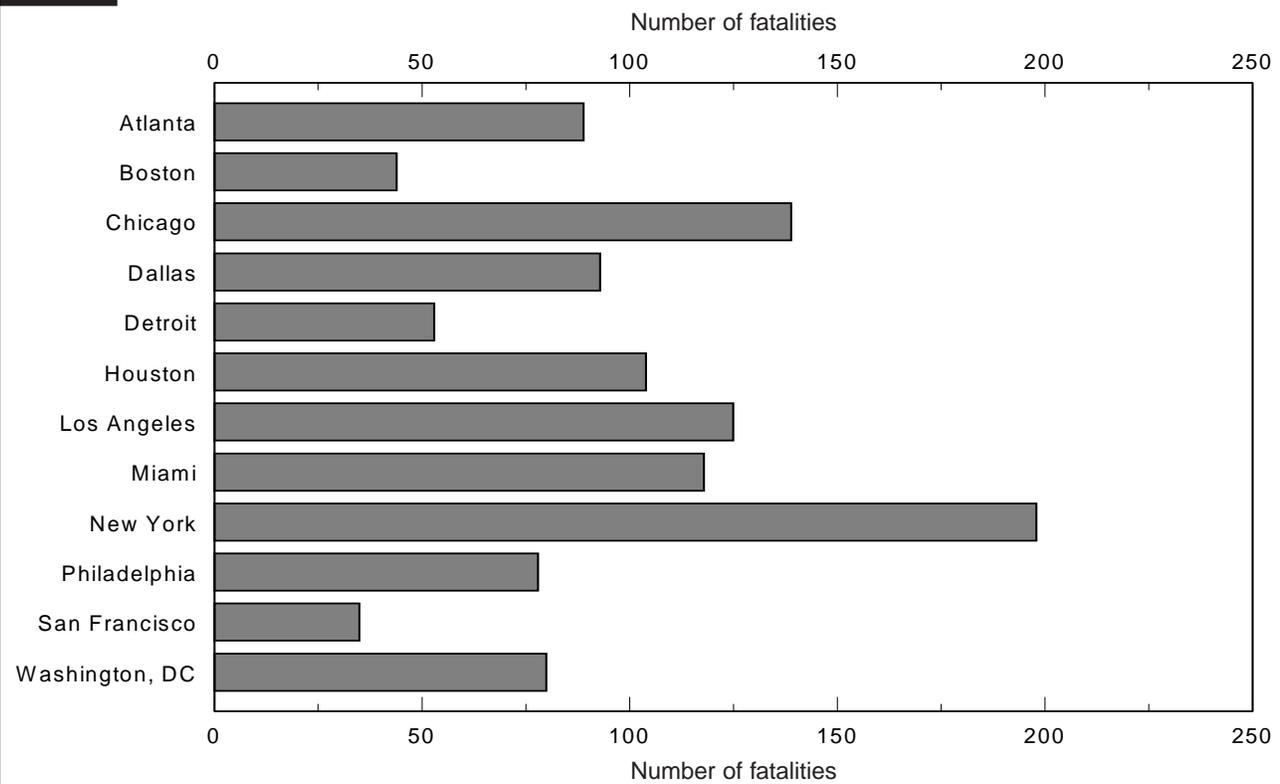
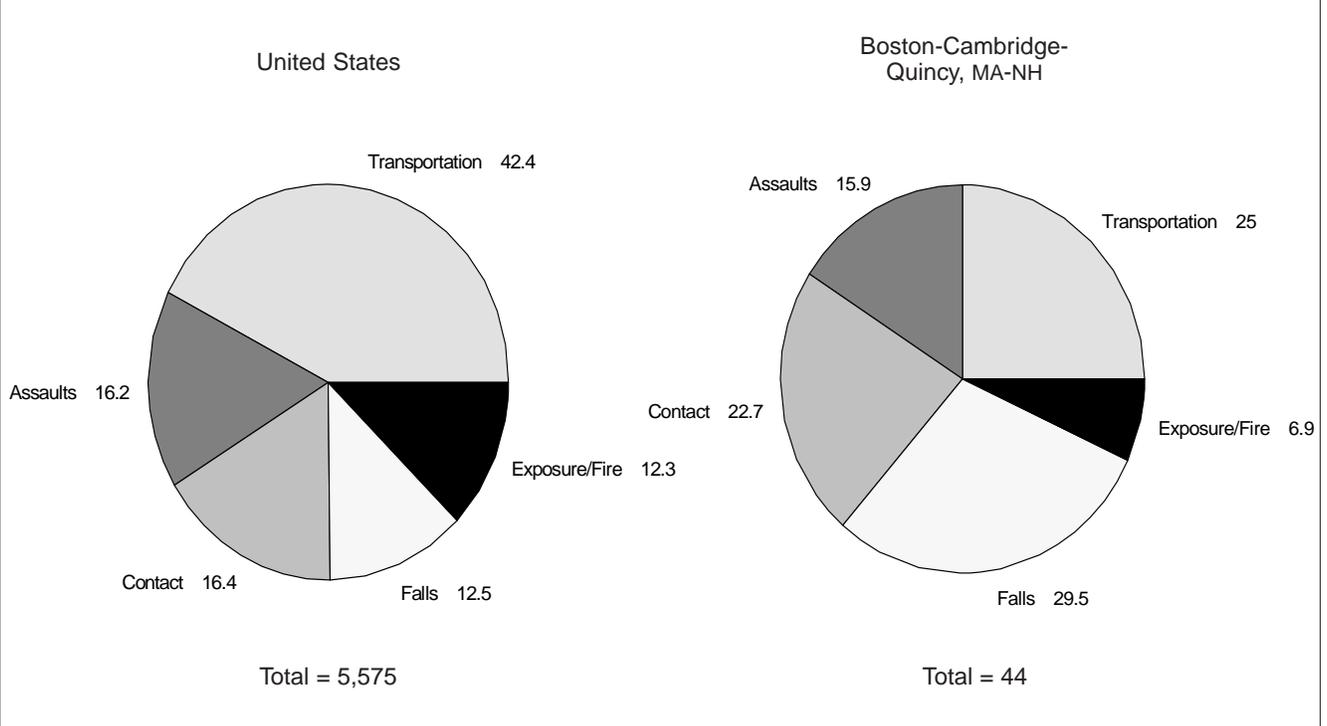


Chart 4. Fatal occupational injuries by fatal event, United States and Boston metropolitan area, 2003, in percent



Other changes

Changes in the definitions of injury and illness cases that were implemented by the Occupational Safety and Health Administration (OSHA) in 2002 resulted in changes to the BLS occupational injury and illness statistics.⁷ For example, the old definition considered application of a butterfly bandage to be medical treatment and a recordable case; the new definition considers such treatment to be first aid and not recordable. Using these new definitions, BLS reported 4.4 million nonfatal injuries and illnesses in private industry workplaces in 2003, resulting in a rate of 5.0 cases per 100 equivalent full-time workers.⁸ While these data follow the trend of declining cases and rates seen throughout the past decade, they are not comparable with data from prior years because of the change in definition.⁹

The 2002 recordkeeping rule included many changes. For example, under the old rule, recurrences of injuries or illnesses after a 30-day period were to be recorded as separate cases. Under the new rule, there is no longer a specified time frame. Employers may consider recurrences that are not brought on by a new event or exposure in the workplace to be the same case. In another example, under the old rules needle sticks were recorded only if they resulted in medical treatment; now, needle sticks are recorded if there is poten-

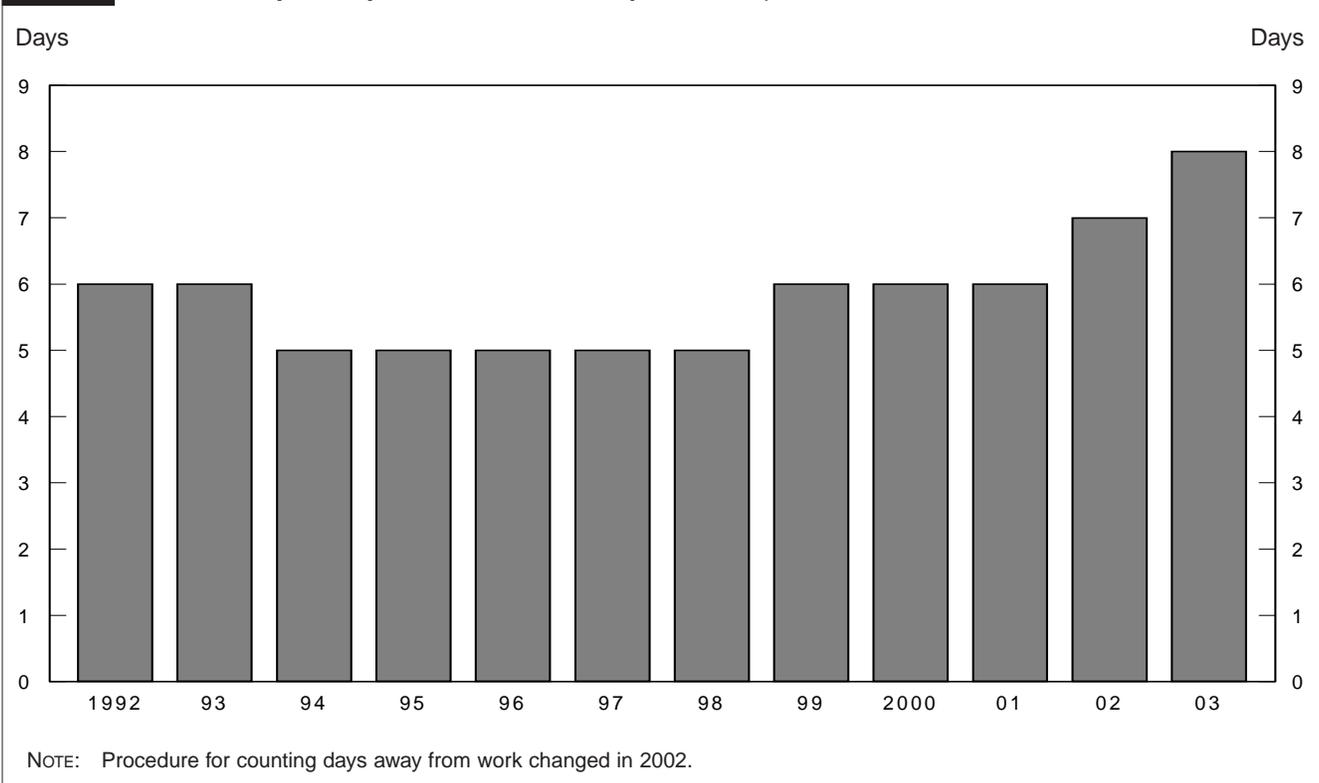
tial contamination with another person's blood, regardless of treatment. Finally, the count of days away from work has changed from work days to calendar days. This could have the effect of increasing the reported days away from work, especially among workers in part-time occupations. Chart 5 shows trends before and after the change in recordkeeping rules.

Emerging injuries and illnesses

There has been growing interest in some injuries and illnesses in recent years. For example, exposure to HIV/AIDS is a concern that did not exist a few decades ago. There is much interest in musculoskeletal disorders, as workers use different equipment and different motion. A subset of this area is the current interest in sprained thumbs, often the result of overuse of personal digital devices. Finally, the rash of attention paid to finger amputations recently has led to many inquiries about such incidents. BLS occupational injury, illness, and fatality data are available to shed light on all of these issues.

Beyond the annual tabulations on injuries, illnesses, and fatalities, the BLS occupational safety and health statistics program has been involved in special studies of safety and health topics. These studies are designed to derive a greater amount

Chart 5. Median days away from work for occupational injuries and illnesses, 1992–2003



of detail about a specific topic. For example, a survey on respirator usage was conducted in 2001. The survey found that 4.5 percent of all private industry establishments required respirator use. In the mining industry, 11.7 percent of establishments required respirator use, as did 12.8 percent of manufacturing establishments.¹⁰ The survey also provided details on the training that employees receive in proper use of respirators, as well as information on different types of respirators.

In 2005–06, the BLS occupational safety and health statistics program will conduct another special survey, this one on employer practices to prevent workplace violence. Informa-

tion to be gathered includes protections that are in place and training provided to employees. Data will be available by NAICS industry classifications.

The occupational safety and health statistics program in the first decade of the 21st century is vastly different from its predecessors in past years. Industries and occupations have evolved; race and geography classifications have become more detailed and more precise; and new definitions and new medical conditions have entered the OSHA lexicon. BLS data on the occupational safety and health of workers has expanded to reflect this new environment. □

Notes

¹ More information on the BLS Occupational Safety and Health Statistics program is available on the Internet at www.bls.gov/iif.

² More information on the North American Industry Classification System is available on the Internet at <http://www.bls.gov/bls/naics.htm>.

³ More information on the Standard Occupational Classification system is available on the Internet at <http://www.bls.gov/soc/home.htm>.

⁴ For a detailed account of the changes in race and ethnicity categories in the U.S. statistical system, see *Report on the American Workforce 2001* (U.S. Department of Labor, 2001), on the Internet at <http://www.bls.gov/opub/rtaw/rtawhome.htm>.

⁵ More information on metropolitan area definitions is available on the Internet at <http://www.census.gov/population/www/estimates/metrodef.html>.

⁶ Data are for the metropolitan area, which includes the central city and surrounding locations.

⁷ A comparison of recordkeeping rules before and after the 2002 change is available on the Internet at www.osha.gov/recordkeeping/RKside-by-side.html.

⁸ *Workplace Injuries and Illnesses in 2002* (U.S. Department of Labor news release 03-913, Dec. 18, 2003). Injury and illness rates represent the number of injuries and illnesses per 100 full-time workers and are calculated by multiplying the number of injuries and illnesses by the total hours worked by all employees during the calendar year. This result is then divided by 200,000 (100 workers times 40 hours per week times 50 weeks per year) to determine the rate per 100 equivalent full-time workers.

⁹ BLS cautioned readers of the differences in the data from prior years and discouraged year-to-year comparisons. Because employers were following the new rules when recording cases throughout 2002, there was no way that two sets of data (under both the old and new rules) could be collected for comparison purposes. For a discussion of the effect of the recordkeeping change on BLS occupational injury and illness data, see William J. Wiatrowski, "OSHA: New Recordkeeping Requirements," *Monthly Labor Review*, December 2004, pp. 10–24.

¹⁰ Data from the BLS survey of respirator usage are available on the Internet at <http://www.bls.gov/iif/oshwc/osh/os/osnr0014.txt>.