Survey of Occupational Injuries and Illnesses

The Injuries, Illnesses, and Fatalities (IIF) program provides annual information on the incidence rate and number of work-related injuries, illnesses, and fatal injuries, and how these statistics vary by incident, industry, geography, occupation, and other characteristics. These data are collected through the Survey of Occupational Injuries and Illnesses (SOII) and the Census of Fatal Occupational Injuries (CFOI).

SOII is an establishment-based survey used to estimate incidence rates and counts of workplace injuries and illnesses. It also provides more detailed case and demographic data for cases that involve one or more days away from work (DAFW) and for days of job transfer and restriction (DJTR) for select industries.

Quick Facts: Survey of Occupational Injuries and Illnesses	
Subject areas	Workplace injuries, illnesses, and fatalities
Key measures	Days away from work Nonfatal workplace injuries & illnesses incidence
How the data are obtained	Survey of businesses
Classification system	Demographic, Industry, Occupation
Periodicity of data availability	Annual
Geographic detail	National, State
Scope	Private sector, State and local government
Key products	• Employer-Reported Workplace Injury and Illness Summary news release • Nonfatal Occupational Injuries and Illnesses Requiring Days Away From Work news release • Survey of Occupational Injuries & Illnesses Summary Estimates chart package • Nonfatal Occupational Injuries and Illnesses: Cases with days away from work chart package • State data • Days of Job Transfer or Restriction Pilot Study
Program webpage	https://www.bls.gov/iif/home.htm

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Concepts

The Occupational Safety and Health Act of 1970 called for a wider statistical net to gather work injury and illness data and to measure their numbers and incidence rates. The current mandatory Survey of Occupational Injuries and Illnesses (SOII), modified on several occasions to incorporate various changes discussed in later sections, still meets the basic requirements of the 1970 act for counts and rates covering a broad spectrum of work injuries and illnesses in various work settings. In response to a 1987 National Academy of Sciences (NAS) study (described in more detail in the history section), SOII began to collect information on the circumstances of nonfatal cases involving days away from work and the characteristics of workers sustaining such injuries and illnesses for the 1992 calendar year. SOII is a federal/state program in which employers' reports are collected and processed by state agencies in cooperation with the Bureau of Labor Statistics (BLS).

SOII estimates the number and frequency (incidence rates) of workplace injuries and illnesses based on recordkeeping logs kept by employers during the year. These records reflect not only the year's injury and illness experience, but also the employer's understanding of which cases are work-related under recordkeeping guidelines promulgated by the U.S. Department of Labor's Occupational Safety and Health Administration (OSHA). Although SOII uses OSHA's recordkeeping guidelines to facilitate convenient collection of data, it is not administered by OSHA. In addition, the scope of SOII encompasses industries not regulated by OSHA, such as railroad and mining. Information collected through the program is used for purely statistical purposes, will not be viewed by OSHA, and cannot be used for any regulatory purpose.

Besides injury and illness counts, survey respondents also are asked to provide additional information for the subset of nonfatal cases that involved at least 1 day away from work, beyond the day of injury or onset of illness. Employers answer several questions about these cases, including the demographics of the worker, the nature of the disabling condition, the event and source producing that condition, and the part of body affected.

SOII definitions

The following definitions of nonfatal occupational injuries and illnesses used in SOII are the same as those established in the recordkeeping guidelines of OSHA, and used by employers to keep logs and case details of such incidents throughout the survey (calendar) year. (See more info section for citations of instructional materials useful in understanding the types of cases recorded under current recordkeeping guidelines.)

Recording criteria

Nonfatal recordable workplace injuries and illnesses are those that result in any one or more of the following:

- Loss of consciousness
- Days away from work
- Restricted work activity or job transfer
- Medical treatment beyond first aid

In addition to these four criteria, employers must also record any significant work-related injuries or illnesses that are diagnosed by a physician or other licensed healthcare professional or other instances that meet additional criteria discussed below. Significant work-related injuries or illnesses include cancers, chronic irreversible diseases, fractured or cracked bones (including teeth), or punctured eardrums. Additional cases that must be recorded as workplace injuries or illnesses include the following:

- Any needlestick injury or cut from a sharp object that is contaminated with another person's blood or other potentially infectious material
- Any case requiring an employee to be medically removed under the requirements of an OSHA health standard
- Tuberculosis infection as evidenced by a positive skin test or diagnosis by a physician or other licensed health care professional after exposure to a known case of active tuberculosis
- An employee's hearing test (audiogram) reveals 1) that the employee has experienced a standard threshold shift (STS) in hearing in one or both ears (averaged at 2kHz, 3kHz, and 4kHz) and 2) the employee's total hearing level is 25 decibels (dB) or more above audiometric zero (also averaged at 2kHz, 3kHz, and 4kHz) in the same ear(s) as the STS.

Additional details regarding recordability of nonfatal work-related injuries and illnesses can be found in *Detailed guidance for OSHA's injury and illness recordkeeping rule*.

Injuries and illnesses. The distinction between occupational injury and occupational illness was eliminated from OSHA recordkeeping guidelines when revisions were implemented in 2002. The OSHA guidelines now define an injury or illness as an abnormal condition or disorder. For purposes of clarification for SOII, these terms are still defined separately. Nature codes from the Occupational Injury and Illness Classification System (OIICS) manual are used to code distinct injury and illness cases.

- *Occupational injury* is any injury, such as a cut, fracture, sprain, amputation, and so forth, that results from a work-related event or from a single instantaneous exposure in the work environment.
- *Occupational illness* is any abnormal condition or disorder caused by exposure to factors associated with employment, other than those resulting from an instantaneous event or exposure. It includes acute and chronic illnesses or diseases that may be caused by inhalation, absorption, ingestion, or direct contact. Five categories of occupational illnesses and disorders are used to classify recordable illnesses, described as follows. Examples of each category are provided, but these are not a complete listing of the types of illnesses and disorders that are counted under each category. (See the OIICS manual for a more comprehensive list of injuries and illnesses and their associated codes.)

Case types. Nonfatal injury and illness estimates are tabulated from SOII data for several types of cases, including the following:

- *Days away from work, job restriction, or transfer (DART)* cases are those which involve days away from work beyond the day of injury or onset of illness, or days of job transfer or restricted work activity, or both.
- *Days away from work (DAFW)* cases are those which result in days away from work (beyond the day of injury or onset of illness). The number of days away from work for these cases is determined according to the number of calendar days (not workdays) that an employee was unable to work, even if the employee was not scheduled to work those days. The day on which the employee was injured or became ill is not counted. These cases may also include days of job transfer or restricted work activity in addition to days

away from work. Take the case of an employee who suffers a work-related injury resulting in 5 days away from work. Upon returning to work, the employee was unable to perform normal duties associated with the job for an additional 3 days (i.e., the employee was on restricted work activity). This case would be recorded as a days-away-from-work case with 5 days away from work and 3 days of restricted work activity. The number of days away for which employers are required to report may be "capped" at 180 calendar days.

- *Days of job transfer or restriction cases (DJTR)* are those which result only in job transfer or restricted work activity. This occurs when, as the result of a work-related injury or illness, an employer keeps or healthcare professional recommends keeping an employee from doing the routine functions of his or her job or from working the full workday that the employee would have been scheduled to work before the injury or illness occurred. This may include the following instances:
  - An employee is assigned to another job temporarily.
  - An employee works at a permanent job less than full time.
  - An employee works at a permanently assigned job but is unable to perform all duties normally connected with it.
  - The day on which the injury or illness occurred is not counted as a day of job transfer or restriction. Workers who continue working after incurring an injury or illness in their regularly scheduled shift but produce fewer goods or services are not considered to be in restricted activity status. They must be restricted from performing their routine work functions to be counted in this category.
- *Other recordable cases* are those which are recordable injuries or illnesses under OSHA recordkeeping guidelines but do not result in any days away from work, nor a job transfer or restriction, beyond the day of the injury or onset of illness. For example, John cut his finger on machinery during his Wednesday afternoon work shift. The injury required medical attention, for which John received sutures at the local emergency room. John was able to return to his normally scheduled workday on the following day (Thursday) and performed his typical work duties without any restrictions.

Differences in coverage between SOII and CFOI

SOII covers private, state government, and local government wage and salary workers, while CFOI also covers workers on small farms, the self-employed, family workers, and federal government workers.

Because of these scope coverage differences, outlined in table 1, CFOI and SOII data are not directly comparable.

Table 1: Scope of covered incidents in CFOI and SOII

Characteristic	CFOI	SOII
Collection method	Uses multiple source documents (e.g., death certificates, workers' compensation reports, and media reports) to substantiate each case, ensuring a census.	Uses a sample of approximately 230,000 establishments to generate detailed estimates. Mandatory survey from BLS for private sector establishments.[1]
Geographic scope	Data are collected from each state, the District of Columbia, New York City, Puerto Rico, the U.S. Virgin Islands, and Guam.	Data are collected from participating states, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and Guam.[2]
Private sector workers	Included	Included
Government workers	Includes federal, state, local, foreign, and other government workers	Includes state and local workers since 2008 uniformly across the nation[3]

Table 1: Scope of covered incidents in CFOI and SOII

Self-employed	Included	Not included[4]
Volunteer workers	Included[5]	Varies[6]
Agriculture, forestry, fishing and hunting	Included	Agriculture establishments with more than 10 employees[7]
Mining	Included	Included[8]
Railroad	Included	Included[9]
Treatment of temporary workers	Coded to the industry in which they are directly employed[10]	Coded to the industry in which they were injured
Specific industries	All included	Private households and Postal workers not included [11]
Illnesses	Not included	Included
Age of workers included	All	All
Cases that occur in territorial waters	Included	Included[12]

Footnotes:

[1] Government establishments are not necessarily required by law to respond. "For State and local government employers, your State laws determine whether (SOII) is mandatory." https://www.bls.gov/respondents/iif/faqs.htm#17.

[2] Data for nonparticipating states are collected and used solely for the tabulation of national estimates.

[3] SOII does not cover workers regulated by other federal agencies, 29 U.S.C. § 653(b)(1) (2011) For example, mines regulated by the Mine Safety and Health Administration or rail transportation firms regulated by the Federal Railroad Administration, nor does it cover federal workers per 29 U.S.C. § 652(5) (2011).

[4] Self-employed workers are not covered by the Occupational Safety Act of 1970. https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=12775.

[5] See Census of Fatal Occupational Injuries (CFOI): Definitions, https://www.bls.gov/iif/oshcfdef.htm and Fatal Occupational Injuries to Volunteer Workers, 2003–2007 (Gunter, 2010).

[6] Different state OSHA plans may cover volunteers. For more information on if a state covers volunteers, please contact the respective state OSHA office. National OSHA regulations do not cover volunteer workers, please see 29 C.F.R. § 1904(31)(a) (2013). See also: http://webapps.dol.gov/elaws/osha/recordkeeping/05.aspx.

[7] The "small agriculture" exclusion is due to a recurring appropriations rider for OSHA that exempts agricultural operations employing 10 or fewer employees from the 1970 OSH Act in its entirety, including mandatory response to the BLS annual survey (Pollack and Gellerman Keimig, 1987: 19). See for example, OSHA Directive CPL-02-00-051.

[8] Mining data are collected by the Mine Safety and Health Administration (MSHA) and are provided to SOII for inclusion in the estimates.

[9] Railroad data are collected by the Federal railroad Administration (FRA) and are provided to SOII for inclusion in the estimates.

[10] Starting in 2011, CFOI began collecting information on contractors and now temporary workers are coded to their directly employed industry as in the past, but also the industry to which they were fatally injured in as well, contractor industry. For more information on contractor data in CFOI see: https://www.bls.gov/iif/oshcfdef.htm.

[11] Though technically no longer excluded from coverage under the Occupational Safety and Health Act of 1970 due to amended language in the 1998 Postal Employees Safety Enhancement Act, BLS has not yet modified SOII to include the U.S. Postal Service. See, for example: https://www.osha.gov/Other_Docs/USPS/USPS.html.

[12] Cases that occur in territorial waters within 3 nautical miles from the general coastline or 9 nautical miles (3 leagues) from Texas, Florida, and Puerto Rico are included. For additional rules including if the vessel is attached to the seabed see: https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=29408.

Injury, illness, and fatality common classifications

BLS publishes statistics on nonfatal workplace injuries and illnesses from SOII and fatal workplace injuries from CFOI. Most of these data can be located at the IIF homepage. SOII and CFOI share several systems to classify industry, occupation, case circumstances, and worker characteristics. Changes among these systems over the past several years have affected SOII (both estimates by industry and by case circumstances and worker

characteristics) and CFOI outputs, as described below. More information on these classifications and how they have affected the data series in the online notice, the presentation section and the history section.

BLS has long relied on state, regional, and national staff to manually assign SOC and Occupational Injury and Illness Classification System (OIICS) codes, but in recent years their role in SOII coding has begun to shift. Motivated by a desire to improve coding quality and by evidence that new automated techniques might result in classification accuracies similar to those achieved by staff, BLS began using computers to automatically assign SOC codes to a portion of SOII cases starting with reference year 2014 data.[1] For reference year 2015, BLS expanded autocoding further to include some OIICS coding as well. BLS state and regional staff remain responsible for assigning many codes and are instructed to review and validate all automatically assigned codes.

Occupational Injury and Illness Classification System (OIICS)

BLS developed OIICS to provide a consistent set of classifications of the circumstances of the characteristics associated with workplace injuries, illnesses, and fatalities. OIICS is used to classify the circumstances of each injury, illness, and fatality case. BLS developed the original OIICS structure with input from data users and states participating in the BLS Occupational Safety and Health Statistics (OSHS) federal/state cooperative programs. The original system was released in December 1992 and approved for use as the American National Standard for Information Management for Occupational Safety and Health in 1995 (ANSI Z16.2—1995). In September 2007, BLS updated OIICS classifications to incorporate various interpretations and corrections.

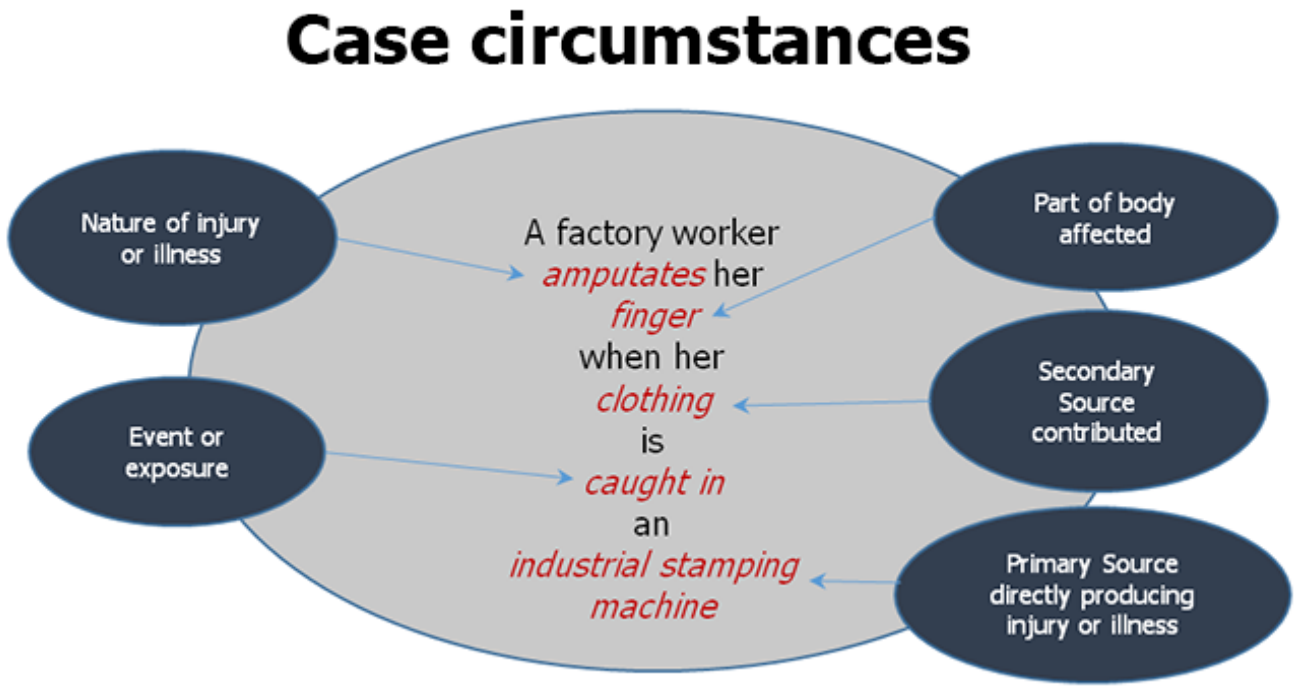
The OIICS revision in September 2010 was the first major revision since this classification system was first developed in 1992. BLS implemented a revised OIICS structure based on input from many stakeholders. In February 2008, BLS issued a Federal Register Notice requesting suggestions for proposed changes to OIICS. In addition, BLS sent out numerous letters and emails to stakeholders who use the OIICS to classify injury and illness data. In April 2010, BLS issued a draft of the revised OIICS 2.01 manual to interested parties requesting their comments. The team evaluated the comments received, made revisions, and issued the completed OIICS 2.01 manual in September 2010. Due to substantial differences between OIICS 2.01 and the original OIICS structure, which was used from 1992 to 2010, BLS advises against making comparisons of the case characteristics from 2011 forward to prior years. More on OIICS can be found here: https://www.bls.gov/iif/oshoiics.htm.

SOII and CFOI use five classifications to describe each incident that led to a serious nonfatal injury or illness or a fatal injury:

- **Nature of injury or illness**—the physical characteristics of the disabling injury or illness, such as cuts and lacerations, fractures, sprains and strains, or electrocution
- **Part of body affected**—the part of body directly linked to the nature of injury or illness cited, such as finger, arm, back, or body systems
- **Event or exposure**—the manner in which the injury or illness was produced or inflicted, such as caught in running equipment; slips, trips, or falls; overexertion; or contact with electrical current
- **Primary source**—the object, substance, exposure, or bodily motion that was responsible for producing or inflicting the disabling condition, such as machinery, ground, patient, or electrical wiring
- **Secondary source**—the object, substance, or person, if any, that generated the source of injury or illness or that contributed to the event or exposure, such as ice or water that contributed to a fall

Exhibit 1 is an illustrative example of how SOII may use OIICS codes to describe the case circumstances of an injury or illness incident:

Exhibit 1. Five classifications describe an incident that led to a work-related injury



Source: U.S. Bureau of Labor Statistics

- **Nature:** 1311 Amputation
- **Part:** 4420 Finger(s), fingernail(s), unspecified
- **Event:** 6410 Caught in running equipment or machinery, unspecified
- **Primary source:** 3560 Presses, except printing, unspecified
- **Secondary source:** 9110 Clothing, unspecified

Industry

From 1992 to 2002, SOII and CFOI used the 1987 Standard Industrial Classification (SIC) system to define industry. Despite periodic updates to the SIC system, increasing criticism led to the development of a new, more comprehensive system that reflects more recent and rapid economic changes. Many industrial changes were not accounted for under the SIC system, such as recent developments in information services, new forms of health care provision, expansion of the services sector, and high-tech manufacturing.

The North American Industry Classification System (NAICS) was adopted to define industry beginning with the 2003 reference year. Because of the substantial differences between NAICS and the SIC system, the results by industry in 2003 constitute a break in series. NAICS 2002 was used to define industry for reference years 2003–08; NAICS 2007 was used to define industry for reference years 2009–13; NAICS 2012 was adopted to define industry starting with the 2014 reference year. Users are advised against making comparisons between industry data for 2003 forward and the industry data for previous years. Note that the change from NAICS 2007 to NAICS 2012 resulted in a break in series among industry-level estimates from SOII; however, no series break resulted for the CFOI data. More details on the current NAICS classification as it is used in the IIF programs are below. You can also find a timeline with the details of which coding structures are used for which year in the history section.

North American Industry Classification System (NAICS)

NAICS was developed in cooperation with Canada and Mexico to replace the SIC system, and it was one of the most profound changes for statistical programs focused on measuring economic activities. NAICS uses a process-oriented conceptual framework to group establishments into industries according to the activity in which they are primarily engaged. Establishments using similar raw material inputs, similar capital equipment, and similar labor are classified in the same industry. In other words, establishments that do similar things in similar ways are classified together.

NAICS provides the means to ensure that SOII and CFOI statistics accurately reflect changes in a dynamic U.S. economy. The downside of this change is that these improved statistics resulted in time series breaks due to the significant differences between SIC and NAICS. Every sector of the economy was restructured and redefined under NAICS. A new Information sector combined communications, publishing, motion picture and sound recording, and online services, recognizing our information-based economy. NAICS restructured the manufacturing sector to recognize new high-tech industries. A new subsector was devoted to computers and electronics, including reproduction of software. Retail trade was redefined. In addition, eating and drinking places were transferred to a new accommodation and food services sector. The difference between the retail trade and wholesale trade sectors is now based on how each store conducts business. For example, many computer stores were reclassified from wholesale to retail. Nine new service sectors and 250 new service-providing industries were recognized with the adoption of NAICS in 2003.

NAICS uses a 6-digit hierarchical coding system to classify economic activities into 20 industry sectors—4 sectors are mainly goods-producing sectors, and 16 are entirely service-providing sectors. The 6-digit hierarchical structure of NAICS 2012 allowed for the identification of 1,065 industries. NAICS is revised on a 5-year cycle to reflect changes in the economy, resulting in new standards for 2007 and 2012. These changes were incorporated into SOII and CFOI industry data 2 years later, for 2009 and 2014 respectively. These changes resulted in a series break for SOII industry data from 2013 to 2014, and footnotes should be consulted to check for incompatibility in other cases. For additional information regarding differences between NAICS 2002, NAICS 2007, and NAICS 2012, visit the U.S. Census Bureau NAICS webpage. See the presentation section for more information on the series.

The following list identifies the individual goods-producing and service-providing industry sectors according to NAICS 2012 classifications:

Goods-producing NAICS industry sectors:

- Agriculture, forestry, fishing and hunting (NAICS 11)
- Mining (NAICS 21)
- Construction (NAICS 23)
- Manufacturing (NAICS 31–33)

Service-providing NAICS industry sectors:

- Wholesale trade (NAICS 42)
- Retail trade (NAICS 44–45)
- Transportation and warehousing (NAICS 48–49)
- Utilities (NAICS 22)
- Information (NAICS 51)
- Finance and insurance (NAICS 52)
- Real estate and rental and leasing (NAICS 53)
- Professional, scientific, and technical services (NAICS 54)
- Management of companies and enterprises (NAICS 55)
- Administrative and support and waste management and remediation services (NAICS 56)
- Education services (NAICS 61)
- Health care and social assistance (NAICS 62)
- Arts, entertainment, and recreation (NAICS 71)
- Accommodation and food services (NAICS 72)
- Other services (except public administration) (NAICS 81)
- Public administration (NAICS 92)

In addition to these NAICS sectors, SOII and CFOI statistics are tabulated for several additional NAICS aggregations that are unique to BLS, including the following:

- Natural resources and mining—combining agriculture, forestry, fishing and hunting (NAICS 11), and mining (NAICS 21)
- Trade, transportation, and utilities—combining wholesale (NAICS 42) and retail trade (NAICS 44–45), transportation and warehousing (NAICS 48–49), and utilities (NAICS 22)
- Financial activities—combining finance and insurance (NAICS 52) and real estate and rental and leasing (NAICS 53)
- Professional and business services—combining professional, scientific, and technical services (NAICS 54); management of companies and enterprises (NAICS 55); and administrative and support and waste management and remediation services (NAICS 56)
- Education and health services—combining education services (NAICS 61) and health care and social assistance (NAICS 62)
- Leisure and hospitality—combining arts, entertainment, and recreation (NAICS 71) and accommodation and food services (NAICS 72)

Residential construction industries include residential building construction industries (NAICS 2361) as well as additional specialty trade contractors that BLS added during the implementation of the NAICS.

These special trade contractors (NAICS 238) have a residential/nonresidential element that is unique to BLS:

The Bureau of Labor Statistics will attempt to provide further industry detail in NAICS by adding 19 industries in subsector 238, specialty trade contractors. These additional industries will provide data, where available, about residential and nonresidential contractors. Some of the new industries will include residential and nonresidential roofing contractors, and residential and nonresidential electrical contractors.[2]

The 19 industries are:

- 238110 Poured concrete foundation and structure contractors
- 238120 Structural steel and precast concrete contractors
- 238130 Framing contractors
- 238140 Masonry contractors
- 238150 Glass and glazing contractors
- 238160 Roofing contractors
- 238170 Siding contractors
- 238190 Other foundation, structure, and building exterior contractors
- 238210 Electrical contractors and other wiring installation contractors
- 238220 Plumbing, heating, and air-conditioning contractors
- 238290 Other building equipment contractors
- 238310 Drywall and insulation contractors
- 238320 Painting and wall covering contractors
- 238330 Flooring contractors
- 238340 Tile and terrazzo contractors
- 238350 Finish carpentry contractors
- 238390 Other building finishing contractors
- 238910 Site preparation contractors
- 238990 All other specialty trade contractors

Occupation

From 1992 to 2002, the program used the U.S. Census Bureau (BOC) occupational classification system. Beginning with the 2003 reference year, SOII and CFOI began using the Standard Occupational Classification (SOC) system to define occupations. Due to the substantial differences between the SOC and BOC systems, the results by occupation for 2003 constitute a break in series. Users are advised against making comparisons between occupation data for 2003 forward and the occupation data for previous years. information on BOC can be found in the online BOC technical paper.. More information on SOC can be found on the SOC homepage. Please note that SOII and CFOI used the 2000 SOC to classify occupation data for years 2003–10 and uses the 2010 SOC for years 2011 forward. More details on the current SOC classification as it is used in the IIF programs is below.

Standard Occupational Classification (SOC)

Beginning with the 2011 reference year, CFOI and SOII began using the 2010 SOC system for coding occupations. Before 2011, the 2000 SOC for occupations was used. While the changes to the new structure (SOC 2010) were not extensive, comparisons of SOC 2000 and SOC 2010 occupations should be made with caution.

The 2010 SOC system classifies workers at four levels of aggregation:

- Major group
- Minor group
- Broad occupation
- Detailed occupation

All occupations are clustered into one of 23 major groups, within which are 97 minor groups, 461 broad occupations, and 840 detailed occupations. Occupations with similar skills or work activities are grouped at each of the four levels of hierarchy to facilitate comparisons. For example, life, physical, and social science occupations (19-0000) is divided into four minor groups: life scientists (19-1000), physical scientists (19-2000), social scientists and related workers (19-3000), and life, physical, and social science technicians (19-4000). Life scientists contains broad occupations such as agriculture and food scientists (19-1010), and biological scientists (19-1020). The broad occupation biological scientists includes detailed occupations such as biochemists and biophysicists (19-1021) and microbiologists (19-1022).

Each item in the hierarchy is designated by a six-digit code. The first two digits of the SOC code represent the major group; the third digit represents the minor group; the fourth and fifth digits represent the broad occupation; and the detailed occupation is represented by the sixth digit. Major group codes end with 0000 (e.g., 33-0000, protective service occupations), minor groups end with 000 (e.g., 33-2000, fire fighting workers), and broad occupations end with 0 (e.g., 33-2020, fire inspectors). (The zeros are not always printed.) All residuals ("other," "miscellaneous," or "all other"), whether at the detailed or broad occupation or minor group level, contain a 9 at the level of the residual. Detailed residual occupations end in 9 (e.g., 33-9199, protective service workers, all other), broad occupations that are minor group residuals end in 90 (e.g., 33-9190, miscellaneous protective service workers), and minor groups that are major group residuals end in 9000 (e.g., 33-9000, other protective service workers):

33-0000 protective service occupations

33-9000 other protective service workers

33-9190 miscellaneous protective service workers

33-9199 protective service workers, all other

Race and ethnicity standards

Both the Census of Fatal Occupational Injuries (CFOI) and the component of the Survey of Occupational Injuries and Illnesses capturing case circumstances and worker characteristics were implemented in 1992, following recommendations of a National Academies of Science review highlighting the need to capture detailed case circumstances and worker characteristics for fatal and nonfatal workplace incidents, respectively. At their inception, each of these series used separate methods to categorize the race or ethnicity of injured or ill workers. For example, SOII categorized Hispanic workers separately, while CFOI categorized Hispanic workers by race (e.g.,

Black or White) and also provided a total count of Hispanic workers. The remaining race and ethnicity categories for both series were:

- White
- Black
- Asian or Pacific Islander
- American Indian or Native Alaskan

The classification of workers by race and ethnicity for CFOI and SOII is based on the 1997 Standards for Federal Data on Race and Ethnicity as defined by the Office of Management and Budget.

In 1999, CFOI amended race categories so that Hispanic workers no longer counted as a race, but solely as an ethnicity. Three additional changes were also incorporated to race and ethnicity categories:

- Asian became a separate category
- Native Hawaiian was combined with Pacific Islander to form a new category, Native Hawaiian or Pacific Islander
- Multirace was added

In 2002, SOII incorporated these same race categories. One result of this revision is that individuals may be categorized in more than one race or ethnic group. Race and ethnicity is one of the few data elements that are optional in SOII. This resulted in 39 percent of the cases involving days away from work for which race and ethnicity were not reported in the 2014 SOII.

NOTES

[1] See *Automated Coding of Worker Injury Narratives*, https://www.bls.gov/osmr/research-papers/2014/pdf/st140040.pdf.
[2] An excerpt from James A. Walker and John B. Murphy, "Implementing the North American Industry Classification System at BLS," *Monthly Labor Review*," December 2001, p. 18, https://www.bls.gov/opub/mlr/2001/12/art2full.pdf.

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Data Sources

Although SOII began as a mail-based survey, most of the SOII data are now collected electronically. Data collection methods for SOII have evolved significantly in recent years in response to BLS goals to collect data more efficiently and to provide more timely and accurate data to its users. Expanded use of available technologies —namely the Internet and other electronic resources as alternative means for responding to SOII—has reduced data collection and processing times. The result has been more timely publication of SOII estimates.

Establishments selected to participate in SOII are notified by BLS in writing in advance of the year for which they will be required to provide data. This notification process ensures that even those establishments not normally required by OSHA to maintain injury and illness logs and case forms will do so for the survey year. Employers then receive instructions on how to record and report their injury and illness experience from state agencies, or the BLS itself in nonparticipating states, early in the year following the year which they are required to record. These packets arrive via mail, but the instructions recommend electronic submission.

Employers have the following options available to meet their requirement to respond to SOII:

- *Internet*. The Internet Data Collection Facility (IDCF) is a centralized platform used by SOII and other BLS programs. The IDCF provides a uniform, manageable, and secure environment for BLS survey collection via the Internet. BLS first used the IDCF for the 2002 survey year. The IDCF survey instrument is a Web-based tool that provides sampled employers the ability to respond to SOII online. Employers can enter their injury and illness data, along with employment and hours worked, using an Internet-based system that is designed to resemble as closely as possible the hard copy survey forms that employers traditionally received and responded to by mail. Approximately 73 percent of responses to the 2014 SOII were submitted via the IDCF.
- *Fax form*. Employers may request a standardized fax form that they can complete and fax back to BLS.
- *Telephone*. Employers may call a SOII representative and report their data over the phone.
- *Mail*. Employers may elect to receive and report their data using a hard-copy, paper survey form that is mailed to them and returned via mail to BLS.

Survey responses received by mail, fax, or telephone are manually keyed into the SOII data collection system. Internet responses remove this manual processing because data are entered directly by the employer in the IDCF and then uploaded into the SOII data collection system. Therefore, Internet responses reduce processing time and remove the risk of errors associated with the manual keying of data required of SOII responses received in hard copy format (e.g., mail or fax). Electronic reporting options may also include in-line edits that assist respondents or immediately identify erroneous data that can be corrected by respondents before submitting their data. All responses, regardless of which reporting option was used, are electronically edited. Responses that do not meet the computer screening criteria or pass senior staff review are subsequently verified with the employer.

Regardless of which option an employer chooses for responding to SOII, each form has been designed to resemble employer OSHA recordkeeping forms to allow for easy transcription.

The SOII data collection form is organized into distinct sections, as follows:

- **Section 1**: *Establishment information*
  This section asks employers to provide basic information about their establishment, including the number of employee hours worked (needed in the calculation of incidence rates) and the reporting unit's average annual employment.
- **Section 2**: *Summary of work-related injuries and illnesses*
  This section asks employers to summarize the number of injuries and illnesses incurred by employees at their establishment, as well as the type of injury and illness cases that occurred. These data can be copied directly from employer injury and illness logs.
- **Section 3**: *Reporting cases*
  This section asks employers to provide detailed information on the worker and the circumstances of the injury or illness for cases that resulted in at least 1 day away from work or, for cases that resulted in job transfer or restriction for selected industries participating in the days of job transfer or restriction (DJTR) pilot study. These worker and case details can be copied from the employer's OSHA case forms. State agency and BLS personnel review the summary data (section 2) and codify the details for the cases reported in this section (see discussion of OIICS in the concepts section) of serious cases (section 3), verifying and correcting apparent inconsistencies by contacting the employer again.
- **Section 4**: *Contact information*
  This section asks employers to provide contact information for the individual who completed the survey form in case there are discrepancies in the reported data that require correction.
- **Section 5**: *If you need help …*
  This section provides employers with contact phone numbers within each state should they have questions or require assistance in completing the survey form.

Every year, by midsummer, the active data collection phase of SOII is completed and the preparation of data for both national and state estimates of nonfatal occupational injuries and illnesses begins. Estimates of the incidence rates and counts of employer-reported injuries and illnesses by detailed industry and type of case are published in late-October. A subsequent release in November provides estimates on the details of the case circumstances and worker characteristics for injuries and illnesses that involved days away from work.

Mining data are collected by the Mine Safety and Health Administration (MSHA), and railroad data are collected by the Federal Railroad Administration (FRA), which are then provided to SOII for inclusion in the estimates.

Confidentiality

All data collected in the SOII are subject to the BLS confidentiality requirements that prevent the disclosure of identifying information. Data collected from SOII are used solely for statistical purposes. All BLS employees and the state grant agency partners who work with the SOII data take an oath of confidentiality and are subject to fines and imprisonment for improperly disclosing information provided by respondents. Confidentiality certification training is required annually.

At BLS, the data are processed and stored on secure servers, with access limited to employees having security clearances.

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Design

A two-stage process is used to select a sample from which estimates are generated for the Survey of Occupational Injuries and Illnesses (SOII). The first stage involves the selection from a frame that is compiled from multiple sources, primarily the Quarterly Census of Employment and Wages (QCEW). The frame includes all in-scope establishments that will be required to participate in SOII (i.e., sample units). The units are selected to create a stratified sample that takes into account industry, ownership, and establishment size. The second stage is the selection of sample cases involving days away from work and sample cases involving job transfer or work restriction from the establishments that have been selected. All cases involving days away from work are collected from most establishments. However, as a way to reduce respondent burden, establishments that have a large number of cases involving days away from work are instructed to report a subsample of their cases that occurred in specified time periods. Cases involving job transfer or work restriction are collected from establishments in select industries.

Because SOII is a federal–state cooperative program and the data are designed to meet the needs of the states,[1] an independent sample is selected for each participating state or U.S. territory.[2] The sample is selected to represent all in-scope private industries, state government, and local government. The sample size for SOII is dependent upon the:

- number and kind of cases for which estimates are needed
- industries for which estimates are desired
- characteristics of the population being sampled
- target reliability of the estimates
- survey design employed.

One criterion of the SOII design is identifying target estimation industries (TEIs). TEIs, which are selected by each state, are North American Industry Classification System (NAICS) industries or groups of industries for which a state wishes to produce an estimate. For example, a state may select to target estimates for hospitals (NAICS 622). This TEI would include establishments in general medical and surgical hospitals (NAICS 622110), psychiatric and substance abuse hospitals (NAICS 622210), and specialty hospitals, except psychiatric and substance abuse (NAICS 622310). A sampling cell is defined by state, ownership, TEI, and size class for which an estimate will be tabulated. Size classes are based on an establishment's average annual employment, as defined below:

- Size class 1 = establishments with 1–10 employees
- Size class 2 = establishments with 11–49 employees
- Size class 3 = establishments with 50–249 employees
- Size class 4 = establishments with 250–999 employees
- Size class 5 = establishments with 1,000 or more employees

In SOII, the variability of the incidence rate for total recordable cases (TRC) of injuries and illnesses is used as the primary variable for determining allocation of the sample, because there is a high correlation between these cases and other important characteristics of the data being estimated. Historical TRC rates by state are used to calculate the variance. The optimal allocation procedure distributes the sample to the industries in a manner intended to

minimize the variance of the total number of recordable cases in the universe or, alternatively, the incidence rate of recordable cases in the universe. In strata with higher variability of the data, a larger sampling is selected. For some sampling cells, it is necessary to select all frame units in the cell in order to meet minimum sampling requirements or to ensure that an adequate number of units are sampled to produce accurate and reliable estimates for the cell.

Once sampling is complete and all necessary reviews and adjustments have been made, sampling weights are calculated for units selected in each sampling cell. A maximum weight threshold is applied to sample units. Sampling weights are calculated by dividing the number of frame units in the sampling cell by the number of sample units in that cell as follows:

$$Sample\ weight = \frac{N_u}{n_s}$$

where:

N_U = the number of frame units available for selection in the sampling cell
n_S = the number of units sampled.

For example, if there are 100 frame units in a sampling cell from which 5 units are selected for the sample, then the weight assigned to each of the sample units would be 100 divided by 5, or 20.

NOTES

[1] Contact information for SOII state partners is available at https://www.bls.gov/iif/oshstate.htm.

[2] Data for nonparticipating states are collected by BLS regional staff. Data for these states are used in tabulation of national estimates; however, state-level estimates are not available separately for nonparticipating states.

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Calculation

Nonfatal workplace injury and illness data collected for the Survey of Injuries and Illnesses (SOII) are used to tabulate estimates for two separate data series—annual summary (industry-level) estimates and more detailed case circumstance and worker characteristic estimates for cases that involved days away from work. Part of the estimation process involves weighting sample units and cases to represent all injuries and illnesses from units on the frame from which the sample was selected. Sample unit, case weighting, and calculation of incidence rates are described in the sections that follow.

Weighting for summary estimates

By means of a weighting procedure, sample units represent all units in their state, industry, employment size class, and ownership (private sector, state government, or local government), also referred to as a sampling cell. An *original summary weight* (OSW) for each sample unit is determined by the inverse of the sampling ratio (number of units selected relative to the number of frame units available for selection) for the sampling cell from which the unit was selected. (See example in SOII sample design section.)

Prior to the tabulation of summary estimates, the original summary weight for a sample unit is adjusted by numerical factors to account for nonresponse from some sample units, benchmarking the sampling frame to the current survey year, and the occasional inability for some sample units to report data for the unit as it was sampled. A *final summary weight* (FSW) used in the tabulation of estimates is determined by applying these factors to the original weight:

Unit nonresponse adjustment factor (UNRAF). Because a small proportion of SOII participants do not respond, weights of responding employers in a sampling cell are adjusted to account for nonrespondents by applying a unit nonresponse adjustment factor.

Outlier adjustment factor (OAF). An OAF is applied when an establishment experiences a rare circumstance that makes its case count or hours worked unrepresentative of its sampling cell. Including such data with the original sampling weight would have an undue influence on the estimates. For example, an establishment reports an unusually high number of illness cases and comments that these were the result of a severe and uncommon scabies outbreak. The outlier adjustment factor adjusts the unit's weight to 1 to avoid an overrepresentation of this uncommon occurrence. An adjustment factor to distribute the remaining weighted employment of the outlier unit is also applied to each of the remaining useable units in the sampling cell.

Benchmark factors (BMF). The sample for a particular survey year must be drawn prior to that year, so that selected establishments may be prenotified of their obligation to maintain logs throughout the year. As a result, the universe file from which the sampling frame was developed is not current to the reference year of the survey, making it necessary to adjust the data before publication to reflect current employment levels. This procedure is known as benchmarking. For the SOII, all estimates of totals are adjusted by benchmark factors at the state, industry, and ownership level, and at the national, industry, and ownership level as well. The benchmarking procedure requires a source of accurate employment data which can be converted into annual average

employment figures at the industry level for which separate estimates are desired. The SOII uses employment data primarily derived from the BLS Quarterly Census of Employment and Wages.

Reaggregation factor (REAG). Because there are occasional instances when a sample unit may be unable to report data for the unit as it was sampled, adjustments are made to account for these situations by applying a reaggregation factor to the unit's original summary weight. For example, a sample unit that was involved in a merger may report data covering both the original sample unit and the unit or units with which it merged, requiring an adjustment to the weight to account for the additional unit(s) included in the reported data.

Therefore, the final summary weight for a sample unit is determined by the product of the original summary weight and these four adjustment factors, or:

FSW= OSW x UNRAF x OAF x BMF x REAG

where:

FSW = Final summary weight

OSW = Original summary weight

UNRAF = Unit nonresponse adjustment factor

OAF = Outlier adjustment factor

BMF = Benchmark factor

REAG = Reaggregation factor

Weighting for case and demographic estimates

This applies to SOII cases involving days away from work (DAFW). Each case involving days away from work is weighted by the respective sample unit's final summary weight with which it is associated. In addition, the final summary weight that is applied to each case is adjusted for several factors to ensure that the number of usable cases that have been submitted are equal to the days away from work cases used in the tabulation of summary estimates. These factors are used to adjust for case subsampling (See section on the SOII sample design for discussion of subsampling.) and case nonresponse for those establishments that did not provide information on all cases involving days away from work which occurred in their establishment in the survey year.

Case subsampling factor (CSSF). At the establishment level, the CSSF is applied to adjust for instances in which the number of usable days away from work (DAFW) case forms that are submitted differ from the number of DAFW cases that are reported on the summary. For example, 39 DAFW cases are reported on the sample unit's summary, but 15 case forms are submitted and used, to minimize the burden on the respondent. This CSSF is designed to weight the number of DAFW cases for which usable data were reported to equal the total number of

DAFW cases indicated on the summary (that is, the number of DAFW cases that the establishment experienced). A maximum threshold is applied to this factor, beyond which further adjustments are accomplished through other factors described below. The CSSF is the ratio of DAFW cases reported on the summary to the number of DAFW cases for which data were submitted, or

$$CSSF = \frac{DAFW\ cases\ (summary)}{DAFW\ cases\ (submitted)}$$

Case nonresponse adjustment factor (CNRAF). This is applied at the sampling cell level. The CNAF is applied after the CSSF in instances where the CSSF failed to adequately adjust reported summary DAFW cases to equal the submitted usable DAFW cases for a sampling cell. The CNRAF is designed to adjust for cases that were not reported as a result of nonresponse within the sampling cell. A maximum threshold is applied to this factor, beyond which further adjustments are accomplished through the CRAF discussed below. The CNRAF is calculated as

where:

FSW = Final summary weight

BMF = Benchmark factor

CSSF = Case subsampling factor.

Case ratio adjustment factor (CRAF). This is applied after both the CSSF and CNRAF factors have been applied but have failed to adjust for missing cases. The CRAF is applied at the estimation cell level (target estimation industry and size class). The CRAF is calculated as

where:

FSW = Final summary weight

CSSF = Case subsampling factor

CNRAF = Case nonresponse adjustment factor.

Incidence rate calculation

Incidence rates are calculated using the total case counts obtained through the weighting and benchmarking procedures described above. The adjusted estimates for a particular characteristic, such as injury and illness cases involving days away from work, are aggregated to the appropriate level of industry detail. The total is multiplied by 200,000 for injuries and illnesses combined and for injuries only (that is, 40 hours per week multiplied by 50 weeks—the base of hours commonly regarded as worked by 100 full-time employees during a calendar

year). The product is then divided by the weighted and benchmarked estimate of hours worked as reported in the SOII for the industry segment. The formula for calculating the incidence rate is:

$$\text{Incidence rate} = \frac{(Sum\ of\ characteristics\ reported) \times 200{,}000}{Sum\ of\ number\ of\ hours\ worked}$$

Incidence rates for higher levels of industry detail are produced using aggregated weighted and benchmarked totals. Incidence rates may be computed by industry, employment size, state, various case circumstances, and select worker characteristics. Incidence rates for illnesses and for case and worker characteristic categories are published per 10,000 full-time employees, using 20,000,000 hours instead of 200,000 hours in the formula shown above. (The 20,000,000 hours refers to 10,000 full-time employees working 40 hours per week, 50 weeks per year.) Incidence rates per 10,000 workers can be converted to rates per 100 workers by moving the decimal point left two places and rounding the resulting rate to the nearest tenth.

Reliability of SOII estimates

Estimates from the SOII are based on a scientifically selected probability sample, rather than a census of the entire population. (See section on SOII sample design.) Sampling methodology makes it possible to collect data from a sample from which inferences can be made regarding the characteristics of the population from which the sample was selected. These sample-based estimates may differ from the results obtained from a census of the population. The sample used for the SOII was one of many possible samples, each of which could have produced different estimates. The variation in the sample estimates across all possible samples that could have been drawn is measured by the relative standard error (RSE), which is used to calculate a confidence interval around a sample estimate.

The 95-percent confidence interval is the interval centered on the sample estimate and includes all values that are within 1.96 times the estimate's standard error. If several different samples were selected and used to estimate a population value (such as injury and illness incidence rates), the 95-percent confidence interval would include the true population value approximately 95 percent of the time.

To calculate the 95-percent confidence range given an RSE:

1. Divide the RSE by 100 and multiply by the survey estimate to determine the standard error.
2. Multiply the standard error by 1.96 to determine the confidence error.
3. The survey estimate plus or minus the confidence error is the 95-percent confidence range.

For example, in 2014 the total injury and illness case incidence rate for nursing care facilities (NAICS 6231) was 7.4 cases per 100 full-time workers, with an estimated RSE of 1.2 percent.

1. Divide 1.2 by 100 and multiply by 7.4 for a standard error of 0.0864.
2. Multiply the 0.0864 standard error by 1.96 to get a confidence error of 0.169

3. Hence, we are 95-percent confident that the interval between 7.2 and 7.6 (or 7.4 ± (1.96 × 7.4 × 0.012)) includes the true value of the incidence rate for total recordable injury and illness cases in nursing care facilities in 2014.

All estimates derived from a sample survey are subject to sampling and nonsampling errors. Sampling errors occur because observations are made on a sample, not on the entire population. Percent-relative standard errors, which are a measure of the sampling error in the estimates, are calculated as part of the SOII estimation process. Both the estimates and the percent-relative standard errors of the estimates can be found at the Industry Injury and Illness Data webpage. Relative standard error estimates for case circumstances and worker characteristic data may be obtained by contacting IIFStaff@bls.gov.

Nonsampling errors in the estimates can be attributed to many sources. Some examples are the inability to obtain information about all cases in the sample, mistakes in recording or coding the data, or definitional difficulties. Although not measured, nonsampling errors will always occur when statistics are gathered. To minimize the nonsampling errors in the estimates, standard procedures are applied to each respondent's information. Completed survey forms are automatically reviewed to ensure the consistency and viability of each case, followed by manual review at the regional and national offices, and apparent inconsistencies are verified with the employer.

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Presentation

The presentation of SOII data is released in the fall, and contains two data components. One, sometimes referred to as the summary, provides estimates of numbers and incidence rates of employer-reported nonfatal injuries and illnesses at the industry level for all types of cases. A second, sometimes referred to as the case and demographics release, details case circumstances and worker characteristics for the subset of the cases that involved days away from work. Prepared tables containing the data can be found for industry data at https://www.bls.gov/iif/oshsum.htm and for case and demographics at https://www.bls.gov/iif/oshcdnew.htm. A schedule of releases from the Injuries, Illnesses, and Fatalities program, which includes SOII, can be found at https://www.bls.gov/iif/osh_nwrl.htm.

Also on the SOII homepages, you will find a chart package, supplemental highlights, quartile incidence rates (for industries), and special profiles for various topics such as musculoskeletal disorders. For more information on methodology for calculating rates or a description of the variables collected and coded for SOII, see the calculation section. All of the rates produced by the SOII program are published online.

In addition to national estimates, state-specific estimates on workplace injuries and illnesses are available for participating state agencies. A list of state agencies and their telephone numbers is available from BLS at (202) 691-6170 or online at https://www.bls.gov/iif/oshstate.htm. The state page also contains a basic data table for each state as well as state nonfatal injury rates (for methodology on calculating rates, please see the calculation section).

Data tools

A variety of tools are available both online and through special request to aid data users. To accommodate the series breaks in SOII (please see the history section for more information) the online data tools can be run for the periods 1992–2002, 2003–2010, 2011–2013 (industry data), and 2011 forward (case and demographics) individually, but cannot cross over these time periods.

Profiles on the Web

The Profiles on the Web system allows users to create customized tables of the number or incidence rate of work-related nonfatal injuries and illnesses based on user-specified criteria. This is a good way to get an overview of the data available in an area of interest, both in magnitude and detail.

Databases

There are various ways to obtain very specific data points available from the BLS public database page for Injuries, Illnesses, and Fatalities at https://www.bls.gov/iif/data.htm. Data users may use a single-screen or multiscreen data search interface to enter search criteria (both obtain data from the same source and provide the same types of output). Output data are presented in HTML, text, or Excel formats (per user preference). Each data point returned is associated with a unique series identifier (ID) and reference period. The series identification (ID)

is composed of a series of codes associated with various survey classification titles. For additional information on series IDs, see https://download.bls.gov/pub/time.series/is/ for employer-reported nonfatal injuries and illnesses at the industry level and https://download.bls.gov/pub/time.series/cs/ (read the .txt files first).

If you already know the specific series ID that you wish to obtain data for, you may use the series report tool https://data.bls.gov/cgi-bin/srgate to simply enter the series ID without having to enter search criteria.

You can also find discontinued data series (resulting from the breaks in series) at the bottom of the database page.

Flat files

Flat files containing all SOII estimates are available through the BLS download server site. Each data series on the BLS download site includes a two-character series designator. Clicking on the series designator expands the directory to provide a list of the files included with each series. Included with each series (generally the last file in each series directory) is a text file that provides: (1) a survey definition and a listing of the FTP files listed in the survey directory; (2) time series, series file, data file, and mapping file definitions and relationships; (3) series, data, and mapping file formats and definitions; and (4) a data element directory. The SOII series have experienced several breaks due to changes in coding systems. Data from these separate series may not be comparable to one another. Consequently, the following flat file series identifiers cover available SOII data reflective of these series breaks:

- SOII — Summary data series:
  - hs — 1976–1988 (1972 SIC)
  - sh — 1989–2001 (1987 SIC)
  - si — 2002 (New OSHA recordkeeping)
  - ii — 2003–2013 (2007 NAICS)
  - is — 2014 forward (2012 NAICS)

- SOII — Case and demographics data series:
  - cd — 1992–2001 (1987 SIC)
  - hc — 2002 (New OSHA recordkeeping)
  - ch — 2003 forward (2007 NAICS)
  - cs — 2011 forward (OIICS 2.01)

Special tabulations

Additional data may be available through contacting the SOII program directly. Special data queries with multiple cross-tabulations for multiple or aggregated years may be run upon request (with some limitations). To request such data, email iifstaff@bls.gov.

SOII microdata

SOII data are collected under a pledge of confidentiality and are protected under the Confidential Information Protection and Statistical Efficiency Act of 2002 (CIPSEA).

BLS allows limited access to SOII microdata for safety researchers and others involved in promoting safety in the workplace. The microdata are available onsite at the BLS national office in Washington, D.C., or at Federal Statistical Research Data Centers (FSRDCs) to researchers who agree to protect the confidentiality of the data and have the safeguards in place to do so. Those seeking to access the microdata must submit a research plan, and final approval for access rests with the Commissioner of BLS. Proposed projects must have a well-defined research question of scientific merit that is of a purely statistical nature. More information about obtaining access to SOII microdata can be found at the BLS restricted data access webpage.

Publications

Articles and detailed tables containing both national and state data are published regularly in the BLS online publications *Beyond the Numbers (BTN)*, *Monthly Labor Review (MLR)*, *The Economics Daily (TED)*, and other publications. There are also some articles in the no-longer-published *Compensation and Working Conditions* that are accessible on the BLS website through the MLR archive.

You can find a list of some of the articles, as well as special compendiums with both SOII and CFOI data, on the IIF publications page.

The IIF program also periodically publishes fact sheets relating the data to current events.

Data are also available at https://www.bls.gov/iif/oshcont1.htm and are published in private safety and trade journals. In addition, state data through 1987 are available on microfiche from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161. A list of states (including telephone numbers) that can provide more current state estimates is available from the BLS Office of Safety, Health, and Working Conditions at (202) 691-6170, or the list can be accessed online at https://www.bls.gov/iif/oshstate.htm.

Data correction

If an error is found in a published SOII data product (news release, data table, etc.), the product is corrected and republished or incorrect data products are removed. Corrected products will clearly note that a correction was made. A record of the error is added to the list of BLS errata, and data users who have signed up to receive notifications from the IIF program are alerted via email. All relevant documentation is updated, and, if appropriate, new webpages are created to document the error and its correction.

Publication guidelines for SOII estimates

Nonfatal occupational injury and illness estimates were published for more than 1,100 NAICS industries (including aggregates) in 2014 including select industries within state and local government, which were published for the first time for the 2008 survey year. Data for the SOII are collected under a strict pledge of confidentiality that these

data will be used solely for statistical purposes and will not be disclosed for other purposes. The number of publishable industries may vary from year to year, depending on the number of industries that fail to meet publication guidelines. Industry estimates may not be published if one of the following situations exists:

- Publication might disclose confidential information.
- The relative standard error of the estimate for days away from work, job transfer, or restriction cases for the industry exceeds a specified limit.
- The benchmark factor for the industry falls outside an acceptable range.

Data for an unpublished industry are included in the total for the aggregate industry level of which it is a part. Also, selected estimates are suppressed within publishable industries if the relative standard error for the estimate exceeds a specified limit.

For case circumstances and worker characteristics, estimates are rounded to the nearest 10 and are suppressed if one of the following situations occurred:

- The number of cases is fewer than 15.
- The number of cases is 15 or greater and the relative standard error for the estimate exceeds a specified limit or if the estimate does not meet confidentiality standards.

Uses and limitations of SOII estimates

National and state policymakers use SOII estimates as an indicator of the magnitude of and trends in occupational safety and health issues. The Occupational Safety and Health Administration (OSHA) uses the statistics to help measure the effectiveness of its enforcement and outreach programs in reducing work-related injuries and illnesses. Private industry labor and management parties use SOII estimates in evaluating safety programs. Other users include insurance carriers involved in workers' compensation, industrial hygienists, manufacturers of safety equipment, researchers, and others concerned with job safety and health.

Many factors can influence counts and rates of injuries and illnesses in a given year. These include not only the year's injury and illness experiences but also employers' understanding of which cases are work-related under current OSHA recordkeeping guidelines. The number of injuries and illnesses reported in a given year also can be affected by changes in the level of economic activity, working conditions and work practices, worker experience and training, and the number of hours worked.

Each year, the SOII measures the number of new work-related illness cases that are recognized and reported. But some conditions, such as long-term latent illnesses caused by exposure to carcinogens, often are difficult to associate with the workplace and are not adequately recognized and reported, and therefore are believed to be understated in the SOII. In contrast, the overwhelming majority of the reported new illnesses are those which are easier to directly link to workplace activity (such as contact dermatitis or carpal tunnel syndrome).

SOII estimates have recently come under increased criticism for undercounting all types of workplace injuries and illness, not just long-term latent illnesses. In 2009, BLS received Congressional funding to investigate this issue and initiated an ongoing SOII data quality research program. Like the academic research studies that preceded it, initial BLS research matching SOII data to eligible workers' compensation records in several states points to an undercount of injuries and illnesses by SOII. The overall magnitude of the undercount has proven more difficult to pinpoint. Much of the subsequent research shifted to interviews with employers to learn more about their injury and illness recordkeeping practices and their understanding of OSHA injury and illness recordkeeping rules. Initial results of these interviews point to employer misunderstanding of OSHA recordkeeping rules that could at least partially explain the undercount observed in both academic and early BLS-funded studies. Recent undercount research has shifted focus into studying the feasibility of collecting injury and illness data directly from workers. Data collected from workers would avoid errors associated with employer misreporting and may also be a way to bypass filters to workplace injury and illness reporting that can cause both workers and employers not to report eligible cases. More information on the SOII data quality research program can be found at www.bls.gov/iif/undercount.htm.

Data quality research

BLS is conducting ongoing research to investigate the completeness of the injury and illness counts from SOII. The purpose of this research is to better understand the reasons for an undercount of occupational injuries and illnesses reported by SOII and to identify ways to improve the collection of occupational injury and illness data. More information can be found on our Data Quality Research Page.

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History

Data on safety and health conditions for workers on the job have been produced by the Bureau of Labor Statistics (BLS) since before World War I. The first safety and health report issued by BLS summarized industrial accidents in the iron and steel industries in 1912, presenting information on the frequency and severity of injuries, the occupation of the injured workers, and the nature of their injuries.[1]

Work-related illnesses also were the subject of BLS studies conducted in the early 1900s, such as the pioneering research on lead poisoning in the workplace done by Dr. Alice Hamilton.[2]

The current BLS Survey of Occupational Injuries and Illnesses (SOII) evolved from annual BLS surveys first conducted in the 1940s, when injury recordkeeping standards became sufficiently uniform to permit the collection of nationwide work injury data. Spanning three decades, those nationwide surveys proved useful in measuring and monitoring injury frequency and severity, but they had two major limitations. First, the survey data were compiled from and represented only employers who volunteered to record and report work injuries. Second, work injuries were limited to those that resulted in death, permanent impairment, or temporary disability, defined as unable to perform regular job duties beyond the day of injury. Thus, survey estimates excluded many employers and, by definition, numerous cases that required medical treatment (beyond first aid) or restricted work duties but did not result in days away from work.

These and other limitations were addressed in a landmark piece of safety legislation passed by the U.S. Congress: the Occupational Safety and Health Act of 1970 (OSH Act). Under the OSH Act Congress delegated the responsibility for developing a comprehensive statistical system covering work-related injuries, illnesses, and fatalities in private industry to the BLS. The separation of responsibilities at the national level between data collection (BLS), regulatory action (OSHA), and safety and health research (CDC/NIOSH) was the original vision of the OSH Act and still remains our primary operating principle. Our data providers and stakeholders rely on BLS data being compiled without bias, without regulatory retribution, or without the possibility of confidentially-collected information being released. Since OSHA and NIOSH use our data for regulatory and formal advisory purposes, it is important that we remain separate from them to maintain impartiality. The 1970 act and its implementing regulations required that most private industry employers regularly maintain records and prepare reports on work-related injuries and illnesses, which include all disabling, serious, or significant injuries and illnesses, whether or not involving time away from work.[3]

In 1972, the BLS, in cooperation with many state governments, designed the Survey of Occupational Injuries and Illnesses (SOII) to estimate the number and frequency of work-related injuries and illnesses by detailed industry for the nation and for states participating in the SOII. The data published from the survey continues to be a great resource to the safety and health community when deciding how to allocate prevention resources among diverse industries, across which, workers' risks of injury and illness vary widely.

As originally designed, however, the SOII had limitations. Although the survey identified industries with dangerous work settings, it failed to produce a reliable count of workplace fatalities. Also, the SOII shed little light on worker

demographics or the circumstances of an injury or illness. For example, the survey did not ask about the manner in which an incident occurred and which occupations were involved.

In 1987, a congressionally funded National Academy of Sciences (NAS) study recommended that these deficiencies be corrected by collecting detailed data on severe, nonfatal occupational injuries and illnesses reported in the SOII and by compiling complete accounts of occupational fatalities from administrative records, such as death certificates and workers' compensation reports.[4] This critical review of the SOII provided the impetus for the redesign of the SOII and the creation of the Census of Fatal Occupational Injuries (CFOI).

Some of the NAS recommendations suggested using multiple data sources such as death certificates and workers' compensation reports to identify and profile fatal work injuries for all workers. More specifically, the Keystone Dialogue Group recommended the development of a method for counting work-related fatalities, stating 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."[5] In this regard, fatality estimates made by different organizations at that time varied greatly from 3,000 to 11,000 deaths nationally per year.[6]

The CFOI approach to compiling data on fatal work injuries was initially tested in a BLS cooperative effort with the Texas Department of Health during 1988. That study, which collected fatality data retrospectively for 1986, highlighted the need for multiple data sources and the feasibility of matching fatalities and their circumstances across those sources.[7] This approach was tested again in Texas and Colorado in 1990, with results confirming that the same kind of data could be obtained from multiple data sources on a current basis.[8] The CFOI was initially implemented in 32 states and New York City in 1991 and expanded to cover all 50 states and the District of Columbia in 1992. As of 2011, the U.S. territories Puerto Rico, Virgin Islands, Guam, and America Samoa are also included.

Several changes that have had significant impacts on data from the BLS safety and health statistics program, including updated recordkeeping requirements, new industry and occupation classification systems, and changes in race and ethnicity standards, are discussed in the concepts section.

Timeline

The following timeline illustrates key developments in identifying and quantifying the annual number of work-related injuries, illnesses, and fatalities. Most changes were milestones in program development, such as the Occupational Safety and Health Act of 1970 and the National Academy of Sciences' National Research Council report, while others were fundamentally philosophical, such as the New Deal's new attitudes toward labor law and regulation.

Key developments

- **1894:** BLS begins publishing extensively on new developments in state and foreign social legislation and practices, including accident prevention and workers' compensation. In the years preceding World War I, BLS begins to give special attention to industrial accidents and occupational diseases.

- **1912:** BLS issues its first annual report on injury rates in the iron and steel industry. A few years later, cooperative arrangements with Massachusetts, New York, and Ohio are established for reporting industrial accidents; additional states later join the program.
- **1926:** BLS introduces an annual survey tracking the frequency and severity of industrial injuries for several manufacturing industries using data compiled from state records, as well as reports from establishments in targeted industries. By 1930, BLS data covered a quarter of the workforce in some 30 manufacturing industries.
- **1939:** Occupational fatality data are added to the survey.
- **WWII (1941-45):** BLS publishes monthly injury data for industries of particular wartime importance. After the war, BLS adds more industries; by 1966, more than 650 industries were included.
- **1970:** The Occupational Safety and Health Act of 1970 instituted common definitions and recordkeeping standards and required employers to maintain accurate workplace injury and illness records.
- **1974:** Data from SOII (summary) are first published, for survey year 1972.
- **1987:** The National Academy of Sciences' National Research Council completes a study that leads to a substantial redesign of the occupational injury, illness, and fatalities statistical program.

(Years below indicate the year of data the change started)

- **1992:** BLS restructures the survey to include data on characteristics of injured or ill workers and circumstances of the specific nonfatal injury or illness involving lost workday cases and launches a census to capture all fatal occupational injuries. (Modern CFOI and SOII program started)
- **1992:** BOC system is used to classify occupation, SIC to classify industry, and original OIICS to code the case characteristics of injuries illnesses and fatalities.
- **1994:** CFOI begins publishing a preliminary report, followed by a revised and final report of occupational fatalities.
- **1999:** CFOI begins collecting and publishing MSA data. (See the CFOI definitions page and the concepts section for more information.)
- **Early 2000s:** BLS begins to provide a variety of web-based tools to facilitate reporting and data dissemination.
- **2001:** CFOI begins collecting data on birthplace. (See the CFOI definitions page for more information.)
- **2002:** OSHA recordkeeping changes result in SOII series break.
- **2003:** SOII and CFOI series break, BLS moves to the Standard Occupation Classification (SOC) system, 2000 edition to code occupations and the North American Industrial Classification System (NAICS), 2002 edition to code industry.
- **2008:** SOII begins publishing national estimates for state and local government.
- **2009:** SOII and CFOI adopt NAICS 2007 edition, not resulting in a series break.
- **2011:** SOII and CFOI series break, BLS moves to the Occupational Injury and Illness Classification (OIICS) 2.01 to code case characteristics. BLS also adopts SOC 2010 edition definitions. CFOI begins collecting and publishing data on contracted workers. (See the CFOI definitions page and concepts section for more information.)
- **2014:** SOII and CFOI adopt NAICS 2012 edition. This does not result in a series break for CFOI or SOII—Case and Demographics, but does result in a series break for SOII—Annual Summary.
- **2015:** CFOI discontinues issuing a preliminary data release, and began publishing a single final data release in December, 4 months earlier than in previous years).

More information on the history of the Injuries, Illnesses, and Fatalities (IIF) program can be found on the IIF History homepage. For more information on the historical development of occupational injury, illness and fatality data, see the articles "Improvements in the BLS safety and health statistical system," "Occupational safety and

health statistics: new data for a new century," "A Century-Long Quest for Meaningful and Accurate Occupational Injury and Illness Statistics," and "The quest for meaningful and accurate occupational health and safety statistics". For more information on the OSHA record keeping changes see the article "Occupational injury and illness: new recordkeeping requirements".

NOTES

[1] The Safety Movement in the Iron and Steel Industry, Bulletin 234 (Bureau of Labor Statistics, 1918).
[2] The White-Lead Industry in the United States, Bulletin 95 (Bureau of Labor, 1911).
[3] See section 24(a) of the Occupational Safety and Health Act of 1970 (Public Law 91–596).
[4] See E.S. Pollack and D.F. Keimig, eds., *Counting Injuries and Illnesses in the Workplace: Proposals for a Better System* (Washington, National Research Council, National Academy Press, 1987), pp. 103–06.
[5] See the Keystone Center's final report, "Keystone National Policy Dialogue on Work-Related Illness and Injury Recordkeeping," (Keystone, CO, January 1989), pp. 47. For an account of various attempts to count fatalities at work, see Dino Drudi, "The evolution of occupational fatality statistics in the United States," *Compensation and Working Conditions*, July 1995.
[6] See BLS Survey of Occupational Injuries and Illnesses (1972–91); the National Safety Council Accidents Facts; and the National Institute for Occupational Safety and Health's National Traumatic Occupational Fatality Study A Decade of Surveillance, 1980–1989.
[7] 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. The study also found that, for verification purposes, timeliness is important in maximizing respondents' recall and in reducing the number of those failing to respond because they have relocated.
[8] 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.

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More Information

Special topic surveys

In addition to the Survey of Occupational Injuries and Illnesses (SOII) and Census of Fatal Occupational Injuries (CFOI) products normally produced in any reference year, BLS has conducted, in conjunction with other governmental agencies, various "special topic" surveys regarding occupational safety and health-related topics. These special surveys have included the following topics:

- Survey of Respirator Use and Practices
- Survey of Workplace Violence Prevention
- Employer Interview Survey
- Employee/Household Survey
- Automated coding

Survey of Respirator Use and Practices

The Survey of Respirator Use and Practices was a special survey of U.S. employers regarding the use of respiratory protective devices conducted by BLS for the National Institute for Occupational Safety and Health (NIOSH), Centers for Disease Control and Prevention (CDC). This voluntary survey provided estimates of the number of establishments and employees who used respirators during a 12-month period by type of respirator and type of use. The survey also collected data on the characteristics of the respirator program at the establishment, assessment of medical fitness to wear respirators, characteristics of respirator training at the establishment, usefulness of NIOSH approval labels and respirator manufacturers' instructions, substances protected against by the use of respirators, and fit testing methods used for respirators. Results from this survey are available at Respirator Use and Practices.

Survey of Workplace Violence Prevention

The Survey of Workplace Violence Prevention was another special survey conducted by BLS for NIOSH. This survey studied the maintenance of a safe work environment, including the prevalence of security features, risks facing employees, employer policies and training, and related topics. Data from this survey are available for private industry and state and local government by industry and size of establishment, where size is measured by the number of workers employed. Results from this survey are available at https://www.bls.gov/iif/osh_wpvs.htm.

Employer Interview Surveys

In 2012, BLS partnered with four states to conduct a series of employer telephone interviews with recent SOII respondents to obtain information on employer injury and illness recordkeeping practices. With its state partners, BLS worked to develop a standardized survey instrument. States contacted a sufficient number of employers to generalize the results of the survey to all employers in that particular state. Additional information on these employer interviews can be found in the 2016 *Monthly Labor Review* article "An update on SOII undercount research activities."

Results from these employer telephone interviews indicated that many respondents lacked OSHA recordkeeping knowledge. This lack of knowledge may result in an overreporting of less severe injuries and illnesses cases, many that did not need to be recorded or reported per OSHA recordkeeping criteria, combined with an underreporting of more severe injury and illness cases in which the worker missed at least one day away from work. Detailed analysis of the results of these interviews can be found in the 2016 Joint Statistical Meeting article "Identifying patterns in employer reporting errors in the BLS Survey of Occupational Injuries and Illnesses."

Following the four-state study, BLS partnered with Westat to conduct a nationwide followup survey of 2013 SOII respondents regarding their injury and illness recordkeeping practices. Initial results from this study point to similar conclusions, with a lack of respondent knowledge of recordkeeping rules possibly contributing to injury and illness cases going unrecorded and unreported to BLS.

Employee/Household Survey

In 2014, BLS began to examine the feasibility of collecting occupational injury and illness data directly from workers to complement the employer-provided data BLS collects via SOII. Research has shown that various filters, or barriers to reporting, can occur when employers collect and report injuries and illnesses. These barriers may be mitigated or avoided by contacting workers directly for this information.

Following some initial exploratory research conducted with Westat, BLS worked with NORC to develop and refine a survey instrument for use in data collection. BLS is using this survey instrument in its work with another contractor, ICF, to conduct a pilot test to determine the feasibility of collecting occupational injury and illness data directly from workers. The results of this pilot will inform future BLS decisions regarding the feasibility of a worker survey.

Automated coding

SOII collects data from sampled establishments on OSHA forms 300 and 301. We use the information provided on these forms to generate detailed statistics on the characteristics of cases involving injury or illness. Prior to survey year 2014, BLS exclusively relied on humans to code cases, on the basis of a careful reading and analysis of the case narrative. In 2014, BLS began using computer assisted coding to code a subset of cases. For more information on these efforts and results, please see our automated coding page.

Job transfer or work restriction

The Bureau of Labor Statistics is conducting an ongoing pilot study to learn more about occupational injuries and illnesses that resulted in days of job transfer or work restriction. The purpose of this study is to compare the case circumstances and worker characteristics of injuries and illnesses that require days away from work to recuperate and those that lead to days of job transfer or restriction only, without time away from work. The regular Survey of Occupational Injuries and Illnesses (SOII) includes only data on the case circumstances and worker characteristics on *days-away-from-work cases*; this study is an expansion of SOII to collect and report the same detail for *days-of-job-transfer-or-restriction cases*.

The study began with an initial set of six North American Industry Classification System (NAICS) subsectors collected for data years 2011–13. For data year 2014, case circumstance and worker characteristic data for days of job transfer or work restriction cases for a different set of industries were collected. Data and additional information are available at https://www.bls.gov/iif/days-of-job-transfer-or-restriction.htm.

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