Census of Fatal Occupational Injuries

The Injuries, Illnesses, and Fatalities (IIF) program provides annual information on the 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).

CFOI is a census that collects and publishes a complete count of work-related fatal injuries and descriptive data on their circumstances.

Quick Facts: Census of Fatal Occupational Injuries	
Subject areas	Workplace injuries, illnesses, and fatalities
Key measures	Fatal workplace injuries
How the data are obtained	Administrative records
Classification system	Demographic, Industry, Occupation
Periodicity of data availability	Annual
Geographic detail	Metro area, National, State
Scope	Government, Military, Private sector, State and local government
Key products	• News release: Census of Fatal Occupational Injuries Summary • Chart package • National and state rates
Program webpage	https://www.bls.gov/iif/oshcfoi1.htm

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Concepts

Since 1992, the Census of Fatal Occupational Injuries (CFOI) has collected and published a comprehensive count of work-related fatal injuries and descriptive data on their circumstances. Limited information on fatalities had been available since 1972 from the Survey of Occupational Injuries and Illnesses (SOII).

CFOI data help safety and health experts and policymakers monitor the number and types of deadly work injuries over time and to identify factors associated with particularly high risks, such as driving a tractor trailer, being a Hispanic or Latino worker, and working in the commercial fishing industry.[1] Fatal injury profiles can be generated from the CFOI database for specific worker groups (such as the self-employed or female workers), for certain types of machinery (such as farm equipment), and for specific fatal circumstances (such as pedestrian fatalities in a work zone). Such profiles help identify existing work standards that may require revision and highlight safety problems where intervention strategies may need to be developed.

CFOI is widely regarded as the preeminent source for data on fatal injuries in the workplace. In 1994 and 1995, several groups of safety experts, including the National Safety Council and the National Center for Health Statistics, endorsed CFOI as the official count of work-related fatalities, in preference to other, less comprehensive measures.

In accordance with Bureau of Labor Statistics (BLS) policies, individually identifiable data collected by CFOI are used exclusively for statistical purposes and are confidential. Some of these data are collected under a pledge of confidentiality and therefore are protected under the Confidential Information Protection and Statistical Efficiency Act of 2002 (CIPSEA).

Scope of CFOI

CFOI includes data for *all* fatal work injuries as long as the decedents were engaged in an activity related to work. Further clarification on the scope of CFOI can be found on the CFOI scope page.

CFOI includes data for all fatal work injuries, regardless of whether the decedent was working in a job covered by the Occupational Safety and Health Administration (OSHA) or other federal or state agencies or whether the job is covered by state workers' compensation. Consequently, comparisons made between the BLS fatality census counts and those released by other federal or state agencies should take into account the different coverage requirements and definitions used by each agency.

Fatal occupational illnesses *are not included* in CFOI. The latency period of many occupational illnesses and the difficulties associated with linking illnesses directly to the workplace pose substantial obstacles to compiling a complete census of fatal illnesses within a given year. Determinations of work-relatedness are far more difficult for occupational illnesses than they are for occupational injuries. Thus, information on illness-related deaths is excluded from the CFOI count.

Differences in coverage between CFOI and SOII

CFOI covers not only private, state government, and local government wage and salary workers covered in SOII, but also workers on small farms, the self-employed, family workers, and federal government workers not covered by SOII. Table 1 details the differences between CFOI and SOII.

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
See footnotes at end of table.		
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)
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.

At-work and injury definitions for CFOI

For a fatality to be included in CFOI, the decedent must have been self-employed, working for pay, or volunteering at the time of the incident; engaged in a legal work activity; and present at the site of the incident as a job requirement.[2] These criteria are generally broader than those used by federal and state agencies administering specific laws and regulations. Fatalities that occur during a person's normal commute to or from work are excluded from CFOI counts.

An occupational injury is defined as any wound or damage to the body resulting from acute exposure to energy, such as heat, electricity, or impact from a vehicle crash or fall, or from the absence of such essentials as heat or oxygen, caused by a specific event or exposure within a single workday or shift. Included are open wounds, intracranial and internal injuries, heatstroke, hypothermia, asphyxiation, acute poisonings resulting from short-term exposures limited to the worker's shift, suicides and homicides, and work injuries listed as underlying or contributory causes of death.

There are many combinations of the general guidelines listed above that can deem a fatality to be work related or not. For detailed descriptions and examples of the scope criteria for CFOI, see the CFOI Scope Determination Handbook.

For more information on the CFOI scope, definitions, and variables of interest, see the CFOI definitions page. The frequently asked questions page also contains useful information.

Data elements

Over 30 data elements are collected, coded, and tabulated in CFOI, including information about the worker and the circumstances surrounding the fatal incident. Some of the elements collected include the following:

- **Case circumstances**
  - Date of death
  - Date of incident

    - Event or exposure
    - Location type (farm, street, warehouse, etc.)
    - Narrative of how incident occurred
    - Nature of injury
    - Part of body affected by injury
    - Primary source of injury
    - Secondary source of injury
    - State of injury/death
    - Metropolitan Statistical Area (MSA) of injury
    - Time of incident (month, day of week, time of day)
    - Time workday began
    - Worker activity (driving a vehicle, tending a store, etc.)
- **Worker characteristics**
    - Age
    - Country of birthplace
    - Gender
    - Race or ethnic origin
- **Employment information**
    - Employee status (wage and salary, self-employed, family business)
    - Industry of contracting entity (if any)
    - Industry of employer
    - Occupation
    - Ownership (private sector or state, local, or federal government)

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 can be found 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,[3] BLS began using computers to automatically assign SOC codes to a portion of SOII cases starting with reference year 2014 data. 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 Injuries, Illnesses, and Fatalities (IIF) 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, improvements, and corrections.

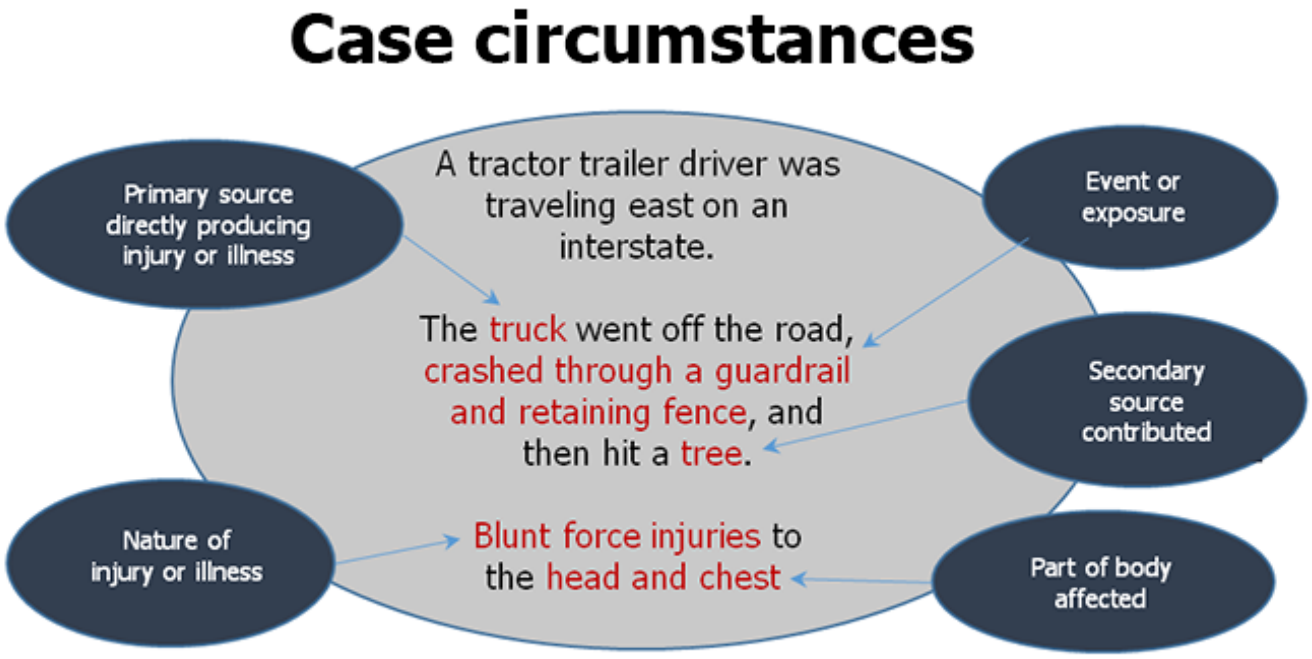
The OIICS revision in September 2010 was the first major revision since this classification system was first developed in 1992. BLS implemented a revised OIICS structure based on input from many stakeholders. In February 2008, BLS issued a Federal Register Notice requesting suggestions for proposed changes to OIICS. In addition, BLS sent out numerous letters and e-mails to stakeholders who use the OIICS to classify injury and illness data. In April 2010, BLS issued a draft of the revised OIICS 2.0 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 with case characteristics of prior years. More information can be found at the OIICS homepage. More information on the changes and process involved in updating the OIICS structure can be found in the article "Updated BLS Occupational Injury and Illness Classification System" and information on using OIICS as a safety and management tool can be found in the article "Using the BLS Occupational Injury and Illness Classification System as a Safety and Health Management Tool."

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 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 electric current
- **Primary source** — the object, substance, exposure, or bodily motion that was responsible for producing or inflicting the disabling condition, such as machinery, 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 a work-related injury is classified and how CFOI may use OIICS codes to describe an injury incident.

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



Source: U.S. Bureau of Labor Statistics

- **Nature of injury or illness:** 1850 Intracranial injuries and injuries to internal organs
- **Part of body:** 8300 Head and trunk
- **Event or exposure:** 2622 Vehicle struck object or animal on side of roadway
- **Primary source:** 8421 Semi, tractor-trailer, tanker truck
- **Secondary source:** 5871 Trees. Rule 3.11 explains what to do when the vehicle collides with multiple objects: the object that produced the most severe impact should be coded as secondary source in these types of instances. Here, the narrative states that the truck traveled through a guardrail and fence before colliding with a tree. From that, we infer that striking the tree was the most severe impact.
- **Note:** This case is still considered a roadway incident even though the object that was struck was on the side of the road.

Industry

From 1992 to 2002, SOII and CFOI used the 1987 Standard Industrial Classification (SIC) system to define industry. View the SIC manual for more information. The SIC system served as the foundation for SOII and CFOI statistics since the inception of each program—1972 and 1992, respectively, and was revised numerous times during its life cycle (most recently in 1987) to account for changes in the composition of the U.S. economy.

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. A timeline with the details of which coding structures are used for which year can be found in the history section.

North American Industry Classification System (NAICS)

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 healthcare provision, expansion of the services sector, and high-tech manufacturing.

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 the 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 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 were added by BLS 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 provide further industry detail in NAICS by adding 19 industries in subsector 238 specialty trade contractors. These additional industries will provide data about residential and nonresidential contractors. Some of the new industries will include residential and nonresidential roofing contractors, and residential and nonresidential electrical contractors.[4]

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 in 2003 constitute a break in series. Users are advised against making comparisons between occupation data in 2003 forward and the occupation data for previous years. More 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 to 2010 and uses the 2010

SOC for years 2011 forward. More details on the current SOC classification as it is used in the IIF programs are 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 CFOI and the component of SOII 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 Hispanics separately, whereas CFOI categorized Hispanics by race (e.g., Black or White) and also provided a total count of Hispanics. 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 Hispanics 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 37 percent of the cases involving days away from work for which race and ethnicity were not reported in the 2014 SOII.

CFOI specific variables

Worker activity in CFOI

Describes the activity engaged in by the worker at the time of the fatal injury. More information on worker activity and the coding structure can be found in the online manual.

Location in CFOI

Indicates the locale, such as, farm, residence, or road construction, where the incident or exposure occurred at the time of the fatal injury. More information on location and the coding structure can be found in the online manual.

Contracted workers in CFOI

This variable indicates whether the decedent was a contracted worker at the time of the incident. In CFOI, a contracted worker is a worker employed by one firm but working at the behest of another firm that exercises overall responsibility for the operations at the site where the decedent was killed. Some additional rules for classifying contracted workers in CFOI:

- A business-to-business relationship to establish contracted worker status must exist. For example, an HVAC repairman working at a private residence is not considered a contracted worker. That same HVAC repairman working at a restaurant is considered to be a contracted worker since a business-to-business relationship is present.
- Incidents that occur at sites where a potential contracting firm does not exercise overall responsibility for the site, such as a public roadway, are not included as contracted workers with certain exceptions.
- Suicides and other incidents that are initiated intentionally by the decedent are not included as contracted workers.

Contracted worker status can be inferred from available case data if not explicitly stated. If, for example, a security guard employed directly by a security firm is killed while working at a bar, the security guard must have been contracted by the bar or else he or she would not have been present.

Note that this definition of a contracted worker is unique to CFOI and likely differs from how contracted workers (sometimes called contractors) are defined elsewhere. Users should be cautious when comparing CFOI data on contracted workers to other data sources because of these definitional differences.

More information on contracted workers can be found in the article "Fatal occupational injuries involving contractors, 2011."

Birthplace in CFOI

This variable indicates the country of birth of the decedent and began being published in 2001. A list of the countries and regions can be found in the online manual.

Metropolitan statistical area in CFOI

Beginning in 1999, CFOI began publishing Metropolitan Statistical Area (MSA) information based on definitions from the Office of Management and Budget (OMB). For reference year 2014 forward, CFOI uses the MSA definitions in OMB Bulletin Number 13-01, February 2013. For more information on the definitions used in previous years please see the CFOI definitions page.

Multiple fatality incidents

CFOI captures whether the worker was killed in an incident where at least one other worker was killed, a multiple-fatality incident, or in an incident where no other worker was killed, a single-fatality incident. Incident type was first collected in 1993. This is done using a linked code and only links decedents in the same reference year. If, for example, there was an explosion at a plant and one worker died in December and another worker was hospitalized but did not die until January, these two cases would not be linked, as the deaths crossed the calendar year.

NOTES

[1] See, for example, Sean Smith, "Workplace hazards of truck drivers," *Monthly Labor Review*, April 2015, https://www.bls.gov/opub/mlr/2015/article/workplace-hazards-of-truck-drivers.htm, Christen Byler, "Hispanic/Latino fatal occupational injury rates," *Monthly Labor Review*, February 2013, pp. 14–23, https://www.bls.gov/opub/mlr/2015/article/workplace-hazards-of-truck-drivers-1.htm, and Jill Janocha, "Facts of the catch: occupational injuries, illnesses, and fatalities to fishing workers, 2003–2009," *Beyond the Numbers*, August 2012, vol. 1 no. 9, https://www.bls.gov/opub/btn/volume-1/facts-of-the-catch-occupational-injuries-illnesses-and-fatalities-to-fishing-workers-2003-2009.htm.

[2] See https://www.bls.gov/iif/oshcfdef.htm for more information on work relationship criteria.

[3] See Alexander C. Measure, "Automated Coding of Worker Injury Narratives," Joint Statistical Meetings, 2014,https://www.bls.gov/osmr/research-papers/2014/pdf/st140040.pdf.

[4] 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

The Census of Fatal Occupational Injuries (CFOI) is a cooperative venture in which the operating costs are shared equally between the state and federal governments. The CFOI program uses diverse state, federal, and independent data sources to identify, verify, and describe fatal work injuries. This ensures that counts are as complete and accurate as possible. Each year, states are responsible for data collection, followup, and coding on a timely basis. Collection of the data is continuous, starting on the first day of the calendar year of the reference period and ending in late fall of the following year, allowing ample time for source document collection, followup requests, and coding review. More information on the initial CFOI results and the methodology used can be found in the articles at Fatal work injuries: results from the 1992 national census and The changing character of fatal work injuries.

States obtain information on fatal work injuries from a number of different sources. A list of the types of source documents that may be used in the collection of information can be found below.

Confidentiality

All data collected in CFOI are subject to the BLS confidentiality requirements that prevent the disclosure of identifying information. The information that is gathered from our source document providers is used solely for statistical purposes. All BLS employees and the state grant agency partners who work with the CFOI 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. CFOI does have a micro data research file available upon approval of the research proposal and application. As a further precaution, BLS applies certain restrictions to the microdata available on the offsite research files. These include geographical and value restrictions that prevent identification of decedents and associated confidential information. More information on the research file is available in section 6.

Source documents collected

Most of the source documents that CFOI uses are considered confidential by their provider. In this context, “confidential” indicates that it was collected under a pledge of confidentiality (meaning that it can be used for statistical purposes only). One of the main reasons CFOI has been able to collect such complete and comprehensive data is the use of these confidential sources. In order to continue to receive these confidential sources, the Bureau of Labor Statistics (BLS) must agree to protect the case-level data it receives from them and report those data in accordance with the agreements the Bureau has with those providers.

These source document agreements are established at both the state and national levels. BLS enters into agreements with federal source document providers while our state partners set up agreements with source document providers within their states, typically state vital records departments, coroners, medical examiners, police, and so forth. Many of these providers at both the state and federal levels only make their information

available because BLS agrees to use the information for statistical purposes only. CFOI currently collects data in 55 jurisdictions—the 50 states, District of Columbia, New York City, Puerto Rico, the U.S. Virgin Islands, and Guam. Each jurisdiction has its own regulations with regard to the availability of data. Some jurisdictions have largely public documents, while others have largely confidential documents.

BLS state partners actively search for and request source documents. For the source documents provided to the states by the national BLS office, states are required to be matched to a case on the file, if determined to be an in-scope case, to ensure cases are not missed. There are also two Data Acceptance Programs (DAP) requiring all states report their annual collection practices to BLS to ensure that access to key source documents is continuing and that these documents are being utilized correctly. Overall, state agencies collect more than 20,000 individual source documents each year or about an average of four documents from different sources for each fatal injury. To avoid duplication in the counts, source documents are matched using the decedent's name and other information (for more information on verifying the data see the calculation section).

Updated figures on the number and type of source documents used in the published CFOI cases are available on the program's web page.

Source document categories received by CFOI at the BLS National Office

- Death certificate
- State workers' compensation report
- Medical examiner report
- Coroner report
- News media report
- Autopsy report
- Toxicology report
- Police report
- Occupational Safety and Health Administration (OSHA) 36 – fatality/catastrophe report (pre- investigation)
- OSHA 01 – inspection report
- OSHA 170 – investigation summary
- Other OSHA report
- Mine Safety and Health Administration (MSHA) report
- Federal Employee Compensation (FECA) report
- Fatality Assessment and Control Evaluation (FACE) report
- Department of Defense military report
- U.S. Coast Guard report
- Longshore and harbor workers incident report
- National Transportation Safety Board (NTSB) report
- Federal Emergency Management Agency (FEMA)/U.S. Fire Administration (USFA) report
- Agricultural report
- Other governmental report
- Informant report/questionnaire
- Employer report/questionnaire
- Hospital, physician, ambulance report
- Funeral home report

- Transfer from other state
- OSHA immigrant language report
- Federal Railroad Administration (FRA)
- National Highway Traffic Safety Administration (NHTSA)/Fatality Analysis Reporting System (FARS)
- Social Security Death Index
- Traffic bureau report
- Survey of Occupational Injuries and Illnesses (SOII)
- CFOI Online Source (CFOI maintains a list of the possible websites with workplace fatality information that is available upon request)
- Other state OSHA reports
- Internal fatality alert
- Other

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Design

The Census of Fatal Occupational Injuries (CFOI) aims to capture all workers in any employee status (wage and salary, self-employed, volunteer, etc.) in all sectors (private, federal (including resident military), state, and local government) that have been fatally injured while working in the United States, including territorial waters.

Because the CFOI is a census, there are no sampling frames, selection, refinement, or response rates. The CFOI program rigorously searches and collects data (as described in the data sources section) to ensure the final workplace fatality count is complete.

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Calculation

Data are collected using a variety of source documents (See data source section for more information.) and entered manually by state partners once a fatal occupational injury has been identified. As more information is gathered, the data are revised until the case has been fully coded.

The system uses a matching scheme to keep duplicate entries for the same fatal injury from being entered. After data entry but before tabulation, a final manual check and final computer-assisted check ensure there are no duplicates. The CFOI program is a true census in that few, if any, cases are missing from the data. This thoroughness is due to the use of multiple source documents rather than relying on a single data collection tool. Outside researchers have reached a consensus confirming the completeness of the data.

To ensure an accurate count of fatal occupational injuries, the CFOI requires that, for each case, the work relationship (that is, whether a fatality is work-related) be substantiated by two or more independent source documents or a source document and a followup questionnaire. Followup questionnaires are sent either to the employer or to another contact with knowledge of the incident. The followup questionnaire is also used to collect information that may be missing from the source documents. At the end of the collection period, fatal injuries for which the state has only one source document are reviewed by BLS. The case is included in the national database only if the state and BLS agree that there is sufficient information on the sole source document to determine that it is indeed work-related.

Data validation

There are many levels of data validation to verify the completeness and correctness of the coding of a case itself. Within the system, there are edits that might indicate missing information or a mismatch in codes according to various coding rules and structures. (See concepts section for more information.)

The CFOI program uses a three-tiered system of manual reviews of both the case and source documents to ensure correct information is being transcribed and coded, which is initiated by the regional BLS offices. Every case is subsequently also reviewed by the national BLS staff to ensure consistency throughout the nation and accuracy of the coding. During the national office review, cases with unusual circumstances may be further vetted by senior staff to ensure those cases meet the scope criteria for the CFOI, according to the definitions found on the CFOI definitions page.

Because the CFOI uses multiple documents, key variables are rarely missing or coded as unknown. The timetable for collecting and coding the CFOI starts at the beginning of the calendar year and runs until late fall of the following year (almost 2 full years for a January death and about 10 months for a December death) to help ensure that the CFOI data are complete and accurate. Ninety-nine to 100 percent of the data are known and coded for selected key data elements that are required to be entered, which excludes the general unknown code.

Data compilation

Data are collected (See data sources section.) and validated. Once data validation checks have been completed, data are compiled by simple aggregation. For a more complete listing of how the data are presented, see the presentation section.

Fatal injury rate methodology and calculation

Fatal injury rates depict the risk of incurring a fatal occupational injury faced by all workers or a subgroup of workers and are used to compare risk over time or with other worker groups. Workers can be grouped for comparison by a number of variables, including industry, worker's age, or gender. Because employment data are not collected by the CFOI, fatal injury rates are calculated using estimates of hours worked from the Current Population Survey (CPS).[1]

In 2008, the CFOI adopted hours-based employment as the denominator of fatal injury rates to measure fatal injury risk (rates were calculated retroactively using this new method for 2006 and 2007 data as well). This methodology is generally considered to be more accurate than employment-based rates per the standardized length of exposure to risk of occupational injury. It is defined as the average number of persons *at work* over the year multiplied by the average hours each employee works over the year. More information on the change from employment to hours-based fatal injury rates is available online. The article "Change to Hours-Based Fatality Rates in the Census of Fatal Occupational Injuries" details the impact of the methodology change.

National rates

To accurately describe fatal injury risk for a worker group, we must refer the numerator (fatal injuries) and denominator (total hours worked) of the rate to the same group of workers. The hours-worked data from the CPS used in the rate calculations do not include workers under the age of 16, volunteers, and members of the resident military. Therefore, fatal injuries occurring to these workers are also excluded from the numerator. Industry data for national rates are broken out by ownership: private, overall government, federal government, state government, and local government.

National fatal injury rates use data from the CPS. As opposed to the employment number, data on people *at work* exclude those who were temporarily absent from a job (classified in the zero-hours-worked category, *with a job but not at work*). Those not at work were absent from their jobs for the entire week for such reasons as bad weather, vacation, illness, or involvement in a labor dispute. Two estimates, *at work* and *average hours*, are combined to create the denominator, *annual total hours worked*:

$$EH = AW * H$$

where:

- *EH* = total hours worked by all employees in a group during the calendar year
- *AW* = at work (number of employees working in a group)

- *H* = average hours (average annual hours worked by an employee in that group)

The hours-based rate (expressed per 100,000 workers) is:

$$\left(\frac{N}{EH}\right) * 200{,}000{,}000$$

where:

- *N* = number of fatal injuries in a group
- *EH* = total hours worked by all employees in a group during the calendar year
- 200,000,000 = base for 100,000 equivalent full-time workers (working 40 hours per week, 50 weeks per year)

State rates

Unlike at the national level, *at work* and *average hours* data are not available at the state level. State rates by industry can be imputed by using national-level *average hours* and *at work* information to calculate the total annual number of hours for each worker industry group, regardless of ownership. State rates are not available by demographic, occupational groups, or for public and private sectors.

The rate represents the number of fatal occupational injuries per 100,000 full-time equivalent workers and was calculated as:

$$\left(\frac{N_S}{EH_S}\right) * 200{,}000{,}000$$

where:

- N_S = number of fatal work injuries in the state
- EH_S = total hours worked by all employees in the state during the calendar year
- 200,000,000 = base for 100,000 equivalent full-time workers (working 40 hours per week, 50 weeks per year)

State rates by industry were imputed by using national-level *average hours* and *at work* information from CPS to calculate the average annual number of hours for each employee, because these data are not available at the state level. EH_S (total hours worked by all employees in the state during the calendar year) was calculated as:

$$EH_S = HW_N * E_S$$

where:

- E_S = State employment
- HW_N = average annual number of hours for each employee at the national level
- The *N* subscript denotes a national number; an S subscript denotes a state number.

Table 1 presents data to be used in an example:

Table 1

Industry	A Employment (in thousands) E_N	B At work (Employment in thousands) AW_N	C Average annual hours (Weekly hours x 50) H_N	D Total hours (Annual, in thousands) $EH_N=AW_N*H_N$	E Adjustment (Annual total hours, per employee) $HW_N = EH_N / E_N$
See footnotes at end of table.					
All industry	145,362	139,824	1,945	271,957,680	1,871
Construction	10,974	10,558	1,980	20,904,840	1,904

Note: Source U.S. Bureau of Labor Statistics, Census of Fatal Occupational Injuries and Current Population Survey, data 2008: national, all ownerships

For the national rates, compute:

$$\frac{N}{EH} * 200{,}000{,}000$$

To get *EH*, the total hours for the year, multiply *at work* and *average hours*. This first step involves columns B, C, and D in table 1. So to get the national denominator:

$$AW_N * H_N = (139{,}824{,}000 * 1{,}945) = 271{,}957{,}680{,}000 = EH_N$$

Then take the total number of fatal injuries in 2008, 5,084 (5,214 minus the number of workers under the age of 16, volunteers, and members of the resident military), and divide by EH_N and multiply by 200,000,000:

$$\left(\frac{5{,}084}{271{,}957{,}680{,}000}\right) * 200{,}000{,}000 = 3.7$$

This would be read as 3.7 fatal occupational injuries per 100,000 full-time equivalent workers.

For the state rates, the information for columns B, C, and D in table 1 is not available, so to impute the state *average hours*, divide the national total hours (column D) by the national employment (column A) to get the average annual number of hours per employee (HW_N, column E, is the imputed number).

The last step, to get the denominator for the state rate, is to multiply the average annual number of hours per employee HW_N by the state employment, using data from California, presented in table 2, as an example:

Table 2

State	Employment (in thousands) E_S	Fatalities N_S
California total	17,045	448
California construction	1,294	67

To get the state rate, the calculation is as follows:

$$\frac{N_S}{E_S * HW_N} * 200{,}000{,}000$$

Using our values from table 1 and table 2, the calculation is as follows:

$$\frac{448}{17{,}045{,}000 * 1{,}871} * 200{,}000{,}000 = 2.8$$

This would be read as 2.8 fatal occupational injuries per 100,000 full-time equivalent workers.

CFOI rates prior to 2008

CFOI fatal injury rates published by BLS for the years 1992 through 2007 were employment-based rates and measured the risk of fatal injury for those employed during a given period, regardless of hours worked. The following is the formula for calculating a fatality rate from 1992 through 2007:

$$\left(\frac{N}{W}\right) * 100{,}000$$

where:

- *N* = the number of fatally injured workers, 16 years and older
- *W* = the number of employed workers, 16 years and older.

For example, in computing the 2005 national fatality rate from 2005 CFOI:

$$N = 5{,}734 - 23\ workers\ under\ age\ 16 = 5{,}711$$

And, from CPS, 2005 annual averages, plus resident military figures derived from the U.S. Department of Defense:

$$W = 142{,}894{,}000$$

So the fatality rate is calculated as:

$$\left(\frac{5{,}711}{142{,}894{,}000}\right) * 100{,}000 = 4.0\ fatalities\ per\ 100{,}000\ workers$$

Comparisons of national and state rates

CFOI uses the Local Area Unemployment Statistics (LAUS) data to calculate state rates, because the CPS does not produce employment estimates by state.

State industry rates are not directly comparable to national industry rates. Due to the difference in the way LAUS and CPS calculate their employment data, state rates include government workers in their respective industry sector and are not broken out separately, both the numerator and denominator include a different group of workers than that of the national rates.

If users decide to add up all the states in one industry and average out their rates to compare it to the national average, they will not get the national average due to this data difference, with the all-ownership/state rates most likely being slightly higher because of the added fatal injuries and different employment data. For more information on fatal injury rates and how they can be used, see our Frequently Asked Question on Rates.

Comparisons of state rates to other state rates

State industry rates are not comparable to other states because of the large differences in the industry composition of employment by state. For example, comparing rates for a state with a large agricultural economy with that of a state with a large industrial economy would be ill-advised because agriculture has one of the highest fatal injury rates while manufacturing has one of the lowest. In addition, the number of fatalities and their circumstances can vary markedly within a state from one year to the next, in part reflecting single incidents involving multiple deaths, such as airplane crashes and natural disasters.

CPS data limitations

There are several *limitations* of using CPS data in CFOI rate calculations:

- Employment sampling errors: The CPS data used to calculate rates are estimates based on a sample rather than a complete count. Therefore, the CPS estimates and fatality rates have sampling errors. The measurement error in the fatality rates is a result of the sampling error of the CPS data used as the denominators. The rates calculated using the CPS may differ from those that would have been obtained from a census of employed persons. See Explanatory Notes and Estimates of Error in the February 2004 Employment and Earnings for an explanation of CPS sampling and estimation methodology, and standard error computations. The relative standard errors of the CPS estimates can be used to approximate confidence ranges for the fatality rates. These standard errors are measured by CFOI but are not releasable due to confidentiality concerns.

- Primary job versus job at the time of incident: The CPS annual average employment data used in the rate calculations count workers according to their primary job, whereas CFOI uses the job held when fatally injured, which may differ.

- State of residence versus state of incident: CPS counts workers by their state of residence, whereas CFOI counts workers by state of incident.

- The annual average of hours worked represent total hours at work for CPS respondents, including those that work more than one job. Total hours worked for respondents with multiple jobs will be recorded in the occupation and industry of the primary job.

- Rates are calculated at the level of detail available from the CPS data. In addition, because the methodology change in 2008, rates are only calculated for those occupations and industries that met minimum thresholds of having at least 15 fatal injuries and 40 million hours worked for national data. The threshold for calculating state fatal injury rates is 5 fatal injuries. See the following section on using fatality rates to evaluate risk for more discussion on the importance of thresholds.

Using fatality rates to evaluate risk and dangerous jobs

Fatal injury rates depict the risk of incurring a fatal work injury for workers in a given worker group expressed as the proportion of fatal injuries per total hours worked annually per 100,000 full-time equivalent workers. This allows risks to be compared among different worker groups. Occupations with few fatal injuries and low employment in the reference year are removed from annual fatal injury rate analyses. Therefore rates produced in prior years may not appear in future years if they do not meet this threshold.

The article "Dangerous Jobs" illustrates the difficulty and impracticality of measuring fatal injury rates for occupations with few workers. The article explains why numbers of deaths, fatal injury rates, and other factors should be considered together when analyzing the danger of particular jobs and uses the occupation elephant trainer in a hypothetical case to illustrate the point.

Example: Is elephant trainer a dangerous job?

- On the one hand, because few workers are employed as elephant trainers, a small number of fatal injuries to elephant trainers would make the fatal injury rate extremely high for a single year, despite their low number of deaths. On the other hand, in most years, this occupation incurs no deaths, rendering their fatality rate 0 and ranking them among the least at risk for incurring a fatal injury.

- "Elephant trainer" is a hypothetical occupational classification. The classification BLS uses groups these workers with either "artists and performers" or "animal caretakers," both of which include many more people than just elephant handlers.

There are many other elements that factor into any definition of a "dangerous job" such as the likelihood of incurring a nonfatal injury, the potential severity of that nonfatal injury, the safety precautions necessary to perform the job, and the physical and mental rigors the job entails.

Because there is no universal definition of "dangerous" or "hazardous," the Injuries, Illnesses, and Fatalities (IIF) program does not frame occupations as the "most dangerous" in a particular year. The IIF program also has certain minimum thresholds that must be met for a fatal injury rate to be published. As such, fatal injury rates are not calculated for many occupations that have a relatively small number of fatal work injuries and employment. Please see "Using fatality rates to evaluate risk and dangerous jobs" for more information.

NOTES

[1] For further discussion, see John W. Ruser, "Denominator Choice in the Calculation of Workplace Fatality Rates," *American Journal of Industrial Medicine*, February 1998.

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Presentation

Summary information including the key fatal injury circumstances (event/exposure, occupation, and industry) and the demographics of workers fatally injured on the job, along with overall counts, are included in a national news release issued annually about a year[1] after the end of the reference period. The latest news release for the Census of Fatal Occupational Injuries (CFOI) can be found at the Injuries, Illnesses, and Fatalities (IIF) program homepage. Data are available at the national, state, and metropolitan statistical area (MSA) level. More information on the schedule of the data releases can be found on the news release page.

CFOI provides annual fatal injury counts by case circumstances and worker characteristics in a variety of ways. Following is a list of the cross-tabulations that appear on the CFOI homepage and are produced every year.

- Industry by selected event or exposure
- Industry by transportation incident and homicide
- Industry by worker status
- Primary and secondary source by major private industry division
- Occupation by event or exposure
- Occupation by transportation incident and homicide
- Worker characteristics (worker status, gender, age, race or ethnic origin) by event or exposure
- Event or exposure by age
- Event or exposure by major private industry sector

These tables are available at the CFOI homepage for the latest year of data. Also found on the CFOI homepage are the chart package, national fatal injury rates, MSA tables, and special profiles for various topics of interest including homicides and Hispanic or Latino workers. For more information on methodology for calculating rates or a description of the variables collected and coded for CFOI see the calculation section. All of the rates produced by the CFOI program are available online.

Besides national data, state-specific data on workplace fatalities are available from participating state agencies. A list of state agencies along with their telephone numbers is available online or by calling (202) 691-6170. The state page also contains a basic data table for each state as well as state fatal injury rates (for methodology on calculating state rates, please see the calculation section).

Data tools

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

In the CFOI for reference year 2011 forward, it is possible for a total value to be suppressed (meaning not published) for confidentiality purposes while one or more component pieces of the total value are published. In these cases, the total value does not meet CFOI's publishability criteria and is therefore suppressed, but one or more component pieces do meet the CFOI publishability criteria and are published.

In these cases, the detailed category is composed of cases that are all from public source documents, whereas the higher level, or aggregate category, that is not publishable is made up of cases that are not all from public source documents.

Profiles on the Web

The Profiles on the Web system allows users to create customized tables of the number of work-related fatal injuries 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 retrieve very specific data points on our databases page. There are single and multiscreen data searches, as well as a series report. More information on the way the CFOI data are classified into series identification codes can be found online.

The discontinued data series (resulting from the breaks in series) are at the bottom of the database page.

Flat files

Flat files of data from the entire CFOI database or parts of the database 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 CFOI series have experienced several breaks due to changes in coding systems. Data from these separate series may not be comparable to one another. The following flat file series identifiers cover available CFOI data reflective of the series breaks (See history section for more.):

cf —1992–2002 (1987 SIC, BOC)

fi —2003–2010 (2002 NAICS, 2000 SOC)

fw—2011 forward (OIICS 2.01)

Special tabulations

In addition to the data available online, some fatality data may be available by the CFOI program directly. Special data queries with multiple cross tabulations are able to be run for multiple or aggregated years (with some limitations). A request can be submitted from the online form.

CFOI microdata/Research file

BLS may approve access to an offsite CFOI microdata research file of individual cases with masked state and personal identifiers. The CFOI research file contains coded information from various sources, compiled into a dataset in which the characteristics for each case included in published CFOI counts has its own row. Some of these data are collected under a pledge of confidentiality and therefore are protected under the Confidential Information Protection and Statistical Efficiency Act of 2002 (CIPSEA). The CFOI microdata research file is available only to researchers who agree to protect the confidentiality of the data and have the safeguards in place to do so. In addition, proposed projects must have a well-defined research question of scientific merit that is of a purely statistical nature. Final approval for access rests with the BLS Commissioner.

Researchers must submit an application of their proposed research topic and usage of the data. Upon approval, BLS will prepare a letter of agreement, which must be signed by the Commissioner of the Bureau of Labor Statistics and an official of the recipient's organization, such as a president, vice president, provost, director of sponsored research, director of contract and grant administration, or similar official, before release of the CFOI research file. By signing the letter of agreement, the researcher and the researcher's organization agree to adhere to BLS confidentiality policy as applicable to the CFOI research file. In addition, all individuals who will have access to the CFOI data must sign an agent agreement acknowledging their understanding of BLS confidentiality policy before accessing the CFOI data. Applications can be submitted at any time but are processed twice a year. Deadlines for processing are March 15 and September 15. Applications received after these dates will not be processed until the next application deadline. The application review process takes approximately 8 to 10 weeks.

The application is available by request. The research file coordinator can be reached at CFOIresfile22@bls.gov, or by calling 202-691-6170. Procedures for obtaining access to the research file can be found online.

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 online library.

A list of some of the articles, as well as special compendiums with both SOII and CFOI data, can be found on the IIF publications page.

The IIF program also publishes fact sheets periodically on topics of interest based on national events related to our data. They can be found on the fact sheet homepage.

Data correction

If an error is found in a published CFOI 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.

NOTES

[1] Data before 2015 were released twice for each reference year. The first was preliminary data released about 9 months after the reference period, followed by a revised and final release of the data about 16 months after the end of the reference period, or about 7 months after the preliminary data. Beginning with the 2015 reference year, final data from the Census of Fatal Occupational Injuries (CFOI) will be released in December —4 months earlier than in past years.

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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

Technical references:

Abraham, Katharine G., William L. Weber, and Martin E. Personick. "Improvements in the BLS safety and health statistical program." *Monthly Labor Review*, April 1996, pp. 3–12. https://www.bls.gov/opub/mlr/1996/04/art1full.pdf.

Brown, Jeff. "Nonfatal injuries and illnesses in state and local government workplaces in 2008." *Monthly Labor Review*, February 2011, pp. 33–40. https://www.bls.gov/opub/mlr/2011/02/art3full.pdf.

Davis, Letitia K., et al. "Data sources for fatality surveillance in commercial fishing: Massachusetts, 1987–91." *Compensation and Working Conditions*, July 1994, pp. 7–13.

Drudi, Dino. "A century-long quest for meaningful and accurate occupational injury and illness statistics." *Compensation and Working Conditions*, winter 1997, pp. 19–27. https://www.bls.gov/opub/mlr/cwc/a-century-long-quest-for-meaningful-and-accurate-occupational-injury-and-illness-statistics.pdf.

Drudi, Dino. "The quest for meaningful and accurate occupational injury and illness statistics." *Monthly Labor Review*, December 2015. https://www.bls.gov/opub/mlr/2015/article/the-quest-for-meaningful-and-accurate-occupational-health-and-safety-statistics.htm.

Northwood, Joyce, Eric Sygnatur, and Janice Windau. “Updated BLS Occupational Injury and Illness Classification System.” *Monthly Labor Review*, August 2012, pp. 19–28. https://www.bls.gov/opub/mlr/2012/08/art3full.pdf.

Richardson, Scott and Rene Reyes. "Fatal work injuries in construction in Texas, 1991–93," *Compensation and Working Conditions*, April 1995, pp. 1–18. https://www.bls.gov/iif/oshwc/cfar0012.pdf.

Toscano, Guy A. and Janice Windau. "The Changing Character of Fatal Work Injuries," *Monthly Labor Review*, October 1994, pp. 17–28. https://www.bls.gov/opub/mlr/1994/10/art2full.pdf.

Toscano, Guy A. and Janice Windau. "Fatal Work Injuries from the 1992 National Census," *Monthly Labor Review,* October 1993, pp. 39–48. https://www.bls.gov/opub/mlr/1993/10/art3full.pdf.

Toscano, Guy A., Janice Windau, and Dino Drudi. "Using the BLS Occupational Injury and Illness Classification System as a Safety Management Tool." *Compensation and Working Conditions*, June 1996, pp. 19–28. https://www.bls.gov/iif/oshwc/cfar0014.pdf.

Toscano, Guy A., and William Weber, "Violence in the workplace." *Compensation and Working Conditions*, April 1995. https://www.bls.gov/iif/oshwc/cfar0005.pdf.

U.S. Bureau of Labor Statistics. *Contractor data from the Census of Fatal Occupational Injuries (CFOI).* Details on the first data reported on fatal occupational injuries incurred by contracted workers, reference year 2011. https://www.bls.gov/iif/oshwc/cfoi/contractor2011.pdf.

U.S. Bureau of Labor Statistics. *Corrections to Survey of Occupational Injuries and Illnesses data, 2011 and 2012*. https://www.bls.gov/bls/errata/iif_errata_1014.htm.

U.S. Bureau of Labor Statistics. *Days of job transfer or restriction pilot study*. https://www.bls.gov/iif/days-of-job-transfer-or-restriction.htm.

U.S. Bureau of Labor Statistics. *Census of Fatal Occupational Injuries—hours-based rates*. Explanation of the differences between employment-based fatal injury rates and the hours-based fatal injury rates that are currently published. https://www.bls.gov/iif/oshnotice10.htm.

U.S. Bureau of Labor Statistics. *Monthly Labor Review*. Articles on safety and health topics. https://www.bls.gov/opub/mlr/subject/a.htm.

U.S. Bureau of Labor Statistics. *Occupational Injury and Illness Classification System (OIICS) manual*, version 2.0, September 2010. Detailed BLS coding structures used to classify workplace injuries resulting in death and for nonfatal injuries and illnesses resulting in days away from work, with explanatory article. https://www.bls.gov/iif/oshoiics.htm.

U.S. Bureau of Labor Statistics. *Standard Occupational Classification.* https://www.bls.gov/soc.

U.S. Bureau of Labor Statistics. *Using Survey data to evaluate your firm's injury and illness experience.* Guidelines to assist employers in comparing their injury and illness experience to others with similar-size workforces in the same industry. https://www.bls.gov/iif/osheval.htm.

U.S. Bureau of Labor Statistics. *Workplace injuries and illnesses, Nonfatal occupational injuries and illnesses requiring days away from work,* and *National census of fatal occupational injuries.* News releases issued annually. Available for 1994 forward at https://www.bls.gov/iif.

U.S. Census Bureau. *North American Industry Classification System*. https://www.census.gov/eos/www/naics/.

U.S. Department of Labor. "Safety and Health in the Workplace." *Report on the American Workforce*, 1994, chapter 3.

U.S. Department of Labor. *OSHA Injury and Illness Recordkeeping*. http://www.osha.gov/recordkeeping/index.html.

U.S. Occupational Safety and Health Administration. *Standard Industrial Classification.* http://www.osha.gov/pls/imis/sic_manual.html.

Wiatrowski, William J. "Occupational safety and health statistics: new data for a new century." *Monthly Labor Review*, October 2005, pp. 3–10. https://www.bls.gov/opub/mlr/2005/10/art1full.pdf.

Wiatrowski, William J. “Using workplace safety and health data for injury prevention.” *Monthly Labor Review*, October 2013. https://www.bls.gov/opub/mlr/2013/article/using-workplace-safety-data-for-prevention.htm.

Wiatrowski, William J. and Jill A. Janocha. “Comparing fatal work injuries in the United States and the European Union,” *Monthly Labor Review*, June 2013. https://www.bls.gov/opub/mlr/2014/article/comparing-fatal-work-injuries-us-eu.htm.

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