

Appendix D. Standardized Coding of Occupational Injuries and Illnesses

Introduction

BLS developed a classification system that helps profile specific injury and illness conditions and their circumstances in a standardized manner, using information about the incident reported by survey respondents. This system helps answer the questions most often asked by safety and health professionals.

This appendix summarizes the four case characteristics that make up the BLS system: Nature of injury or illness, part of body affected, source of injury or illness, and event or exposure.

Besides detailed numeric codes, additional coding aids were developed for each of the four case characteristic structures. Among the aids developed were rules of selection, code descriptions, and edit criteria. The rules of selection and code descriptions offer guidance in choosing the appropriate categories to code. The edit criteria are designed for quality assurance, in that they identify which code combinations for a given case either must exist or are unlikely or definitely incompatible. Specific examples of each aid are included in the sections that follow.

Nature of injury or illness

The code structure for the nature of the injury or illness describes the principal physical characteristic of the work-related injury or illness. Sprains, strains, fractures, carpal tunnel syndrome, and pneumoconioses are a few possible outcomes of a workplace incident or exposure. The nature of the injury or illness provides basic information on the outcome of the work-related incident and, combined with data on the part of body affected and resultant lost days away from work, presents a valuable picture of the severity of workplace injuries and illnesses. The nature code serves as the basis for selection of other case characteristic categories, such as a specific body part. Other categories represent the consequences or circumstances associated with a particular disabling condition. The BLS classification structure for the nature of the injury or illness has seven divisions:

- Traumatic injuries and disorders
- Systemic diseases or disorders
- Infectious and parasitic diseases
- Neoplasms, tumors, and cancer
- Symptoms, signs, and ill-defined conditions
- Other diseases, conditions, or disorders (such as job-related stress)
- Multiple diseases, conditions, or disorders

The first division encompasses traumatic injuries and disorders, effects of external agents, and poisoning. Usually a traumatic injury or disorder is the result of an incident, event, or exposure; the division's categories account for a large majority of cases reported in the occupational environment. Within the division, data are coded and published at a detailed level—for example, separately for chemical, electric, and heat burns. When two or more injuries or illnesses are indicated on the source document for a given case, the more severe condition is coded; for instance, a wrist fracture is chosen over a sprained finger. However, if the multiple injuries are of unknown or equal severity, then the multiple diseases, conditions, or disorders classification is used. For example, the nature classification for a worker with a fractured and burned leg would be fractures and burns. Some source documents describe the disabling condition in general terms only, such as crushed finger or hurt back. Such cases are coded as one of the nonspecified injuries and disorders categories, such as crushing injuries, back pain, or soreness and pain in other areas of the body.

Systemic diseases and disorders had the largest number of reported cases. This division includes information on hundreds of specific diseases and disorders, including carpal tunnel syndrome, welder's flash, inguinal hernia, tendonitis, and allergic dermatitis, to cite a few prominent listings. Viral diseases such as chickenpox account for most of the cases listed within the division of infectious and parasitic diseases. The division of neoplasms, tumors, and cancer includes long-term latent illnesses that often are difficult to relate to the workplace, are not adequately recognized and reported by employers, and thus are believed to be understated in the survey. As the name implies, the symptoms, signs, and ill-defined conditions division includes cases in which no specific diagnosis is identified and none can be inferred from information on the source document. Loss of consciousness is included in this division, for example, but if the loss is heat related, it is coded as the traumatic condition heat syncope. Mental disorders or syndromes, such as neurotic reaction to stress, dominate the division of other diseases, conditions, or disorders.

The multiple diseases, conditions, or disorders division in the nature of injury and illness structure classifies multiple physical characteristics found in two or more of the five other divisions within which diseases and disorders are classified. As stated earlier, classifying cases as multiple suggests that the disabling conditions cited in the source document are of unknown or equal severity.

Part of body affected

This classification structure provides data that are valuable to safety and health practitioners focusing on, say, back injuries or eye disorders. By linking nature and body part codes, one can discern a more complete and precise picture of the damage incurred—for example, an amputated finger distinguished from a fractured finger or an amputated toe from an amputated leg.

The BLS classification structure for the part of the body affected contains eight divisions: Head, neck (including throat), trunk, upper extremities, lower extremities, body systems, multiple body parts, and other body parts. Each division is composed of several specific body parts, some of which are defined separately in greater detail. The trunk, for instance, contains specific codes for the shoulder, chest, back, abdomen, pelvic region, and multiple trunk locations. Within the back grouping are separate codes for the lumbar, thoracic, sacral, and coccygeal regions, as well as multiple back regions. Coding is done at the most detailed level that the source document's information supports.

Traumatic injuries and disorders usually are coded to the external part or location, including specific locations for the mouth and back. Two exceptions to this rule are intracranial injury (including concussion), where "brain" is the designated body part; and an injury or illness such as hypothermia, which affects an entire body system rather than a particular body part, where "body systems" is the designated body part. An internal body part is paired with a disease, disorder, or condition that originates at, or is limited to, that internal part—for example, liver and hepatitis. Many of these "mandatory" combinations are part of the consistency checks within the survey edit system.

When an injury or illness affects two or more body parts within a given division, say a foot and ankle are burned, the appropriate category within "multiple locations" is selected, for example, "foot and ankle." But if the body parts affected are from two or more divisions, say dislocated shoulder and fractured upper arm, then the divisional classification "multiple body parts" applies.

Source of injury or illness

The source of injury or illness identifies the object, substance, bodily motion, or exposure that directly produced or inflicted the injury or illness. If a worker is cut on the head by a falling brick, for example, the brick is the source of injury. There is a direct relationship between the source and the nature of the injury or illness. If a worker slips on oil and falls to the floor breaking an elbow, hitting the floor produces the fracture, so the floor is the source of injury.

The source of the injury does not equate to its cause, as cause is a more complex and subjective concept that is seldom linked to just one factor. In the previous example in which the worker fell, there are numerous candidates for the cause of the injury: The oil; the cleaning staff who did not remove it right away; possibly the management, which failed to alert the cleaning staff; or the coworker or customer who originally spilled the oil. In addition, fatigue might be cited as a cause if the worker was tired and failed to notice a slippery floor warning. Thus, determining cause of injury or illness requires in-depth investigation

of the circumstances surrounding an incident, as well as sophisticated and objective analysis by safety and health experts. Both of these requirements are beyond the scope of case coding. The source classification, however, has objective selection criteria and can be supported by information on the reporting documents.

The BLS classification structure for the source of injury or illness is composed of several thousand individual items, arranged within the following divisions:

- Chemicals and chemical products
- Containers
- Furniture and fixtures
- Machinery
- Parts and materials
- Persons, plants, animals, and minerals
- Structures and surfaces
- Tools, instruments, and equipment
- Vehicles
- Other sources (such as “chips and particles”)

The chemicals and chemical products division includes chemicals and chemical products in various states—liquids, gases, fumes, vapors, and solids. The major groups of the division include acids; alkalies; aromatics and hydrocarbon derivatives including alcohols; halogens and halogen compounds (primarily chlorine and chlorine compounds); metallic particulates, trace elements, dusts, powders, and fumes; agricultural chemicals and other pesticides; general chemical products, such as medicines, soaps, paints, and solvents; coal, natural gas, and petroleum fuels and products (such as lubricating grease and cutting oils); and other chemicals, such as carbon monoxide and plastic resins.

Containers include receptacles commonly used to hold, store, or carry materials. They may be empty or full at the time of the incident. The major groups of the division include nonpressurized containers (most commonly boxes, crates, or cartons); pressurized containers (such as hoses and propane tanks); variable-restraint containers (such as bundles of roofing shingles, paper packages, and rolls of fabric); dishes, drinking cups, and beverage glasses; luggage and handbags; and skids and pallets (including those used as working surfaces).

Furniture and fixtures include the following major groups: Cases, cabinets, racks, and shelves (such as tool chests, garment racks, and store shelving); floor, wall, and window coverings (such as unrolled carpets and draperies); furniture (including beds, bedding, and mattresses); and other fixtures (such as lamps and bathtubs).

Machinery classifies machines in three different ways: By industry or process—for example, agricultural; by function—for example, heating and cooling; or by type of object processed—for example, woodworking. Machines that are primarily used for transporting people or materials are classified in the vehicles division. Handheld power tools are classified in the tools, instruments, and equipment division, as are machinery parts (such as saw blades) known to be unattached and independent of a machine at the time of the incident.

The major groups within the machinery division include agricultural and garden machinery (such as lawn mowers); construction, logging, and mining machinery (such as backhoes and drilling machines); heating, cooling, and cleaning machinery and appliances (especially refrigerators, furnaces, air conditioners, and vacuum cleaners); material handling machinery (including conveyors, elevators, and jacks); metalworking, woodworking, and special material machinery (such as sawing or spot-welding machinery and nonprinting presses); office and business machinery (such as computers and photocopiers); special process machinery (including food slicers, printing presses, and sewing machines); and miscellaneous machinery (such as televisions, air compressors, and vending machines).

Parts and materials are sources of injury and illness if they are unattached and independent of a machine, tool, or vehicle, or if it is unlikely that the machine, tool, or vehicle was involved in the injury. When cited as the source of injury or illness, general floor surface in a building or on the ground is matched to the appropriate entry in the division “structures and surfaces.”

Major groups within the parts and materials division include the solid elements of building materials (including lumber, wallboard, metal pipe or panels, and window panes); fasteners, connectors, ropes, and ties (such as nails and nonelectrical wire); unattached hoisting accessories (such as hooks and shackles); unattached machine, tool, and electric parts (including electrical wiring, motors, dies and molds, and saw blades); nonstructural metal materials (such as molten metal and precious metal ingots); tars, sealants, caulking, and insulating materials (primarily asphalt or roofing tar); nonmetal tarps and sheeting, such as plastic tarps; and unattached vehicle and mobile equipment parts (including tires, batteries, and unattached truck trailers).

Persons, plants, animals, and minerals classifies living organisms (including infectious and parasitic agents) and their products, as well as raw, metallic, and nonmetallic minerals. The vast majority of cases coded to this division are in one of two major groups: 1) Person—injured or ill worker or 2) person—other than injured or ill worker. Bodily motion or position of the injured or ill worker, the dominant subgroup of “person—injured or ill,” includes stresses or strains induced by free movement of the body or its parts, with no impact involved. All cases assigned to this subgroup also must carry an event or exposure of bodily reaction, repetitive motion, or sustained viewing. A healthcare patient or resident is cited as the source of the injury or illness for the large majority of cases in the subgroup, “person—other than injured or ill worker.”

Other major groups within the division include animal and animal products (such as dogs, horses, and leather hides); fresh or processed food products (such as meats and fats/oils); infectious and parasitic agents (primarily viruses); metallic minerals; nonmetallic minerals, except fuels (primarily rocks or crushed stone); and plants, trees, and vegetation in a natural or unprocessed condition (such as trees and logs).

Structures and surfaces classifies all types of structures and structural elements (including building structures and systems, sewers, scaffolds, towers, doors, and walls) as well as walking, working, and road surfaces. Excluded from this division are independent, unattached parts or materials (such as bricks and structural metals), as well as ladders, both fixed and temporary.

The dominant major group within this division is floors, walkways, and ground surfaces. These surfaces can be temporary or permanent, indoor or outdoor, above or below ground, and so forth. Classified separately within this major group are escalators; floors (primarily floor of building); ground (including athletic fields); sidewalks, paths, and outdoor walkways (such as bicycle paths and hiking trails); stairs and steps; streets and roads (including driveways); surfaces below ground level, not elsewhere classified (such as ditches and trenches); parking lots; and other common surfaces, primarily ramps, runways (including airport), and loading docks. The next major group within this division that is important is “other structural elements (door, roof, wall and so forth),” whether they are independent or part of a building or other structure. “Structures,” which primarily includes scaffolds, towers, and sewers, is another significant group.

Tools, instruments, and equipment classifies handtools (nonpowered, powered, and power not determined), ladders (fixed and movable), equipment (photographic, protective, recreation, and athletic), and instruments (medical and surgical), as well as other tools, instruments, and equipment, such as wheelchairs. Excluded from this division are incidents involving parts known to be unattached and independent of a tool, such as unattached saw blades, or incidents in which a tool was probably not involved.

Nonpowered handtools is the most common major group in this division. Such tools are classified according to their functions—for example, knives and other cutting tools or shovels and other digging tools. Handtools in this group are not powered by electricity, fuel (gasoline, coal), air, steam, water, or gunpowder. Powered handtools, another major group commonly cited, includes all hand-held tools that require a source of energy to operate, such as powered saws and welding torches. Cutting or turning handtools (wrenches, for example) are cited most often in the major group “handtools—power not determined.” “Ladders” largely are unspecified in that major group, but movable rather than fixed ladders are almost always cited when the source document provides sufficient information to make that distinction. Other items commonly cited within the remaining major groups of this division include needles and syringes (medical/surgical instruments); cameras (photographic equipment); lifelines, safety belts, and so

forth (protective equipment, except clothing); gymnastic and exercise equipment (recreational and athletic equipment); wheelchairs, healthcare, and orthopedic equipment (stretchers, for example); and pianos among tools, instruments, and equipment not classified in other major groups.

Vehicles for all modes of public, private, work-related, and recreational transportation make up this division. This includes those primarily designed to transport people (for example, automobiles, passenger trains); those chiefly for carrying or transferring goods (for example, forklifts, wheel barrows); and other vehicles such as bicycles, trucks, and off-road nonindustrial vehicles (e.g., all-terrain vehicles, golf carts). Machinery that is primarily used for agricultural, construction, logging, mining, manufacturing, and other processing purposes is excluded from this division. A vehicle code in this division is selected as the source of injury or illness whenever a “transportation incident” is selected as the event or exposure.

Motorized highway vehicle was the most commonly selected major group from this division. Besides trucks and automobiles, which are dominant categories, this category includes buses, vans, and other vehicles that are operated primarily on highways and used for transporting, hauling, delivering, and responding to emergencies. In terms of cases coded, the next two important major groups were plant and industrial powered vehicles and tractors, especially forklifts; and nonpowered plant and industrial vehicles, particularly carts, dollies, and handtrucks. Other major groups in this division included air vehicle; nonmotorized highway vehicle, primarily bicycles; nonindustrial off-road vehicle, such as golf carts; rail vehicle; and water vehicle.

The division of other sources classifies sources of injuries and illnesses that are not included in one of the previous six divisions. This division includes ammunition and explosive devices; apparel and textiles; atmospheric and environmental conditions; paper, books, and magazines; steam, vapors, and liquids not elsewhere classified (for example, water); and scrap, waste, and debris. The latter major group, which accounts for most of the division’s cases, classifies discarded fragments of unknown origin (such as ashes, garbage, sewage, and so forth), as well as other dirt, metal, wood, or unidentified particles.

Event or exposure

The event or exposure code structure describes the manner in which the injury or illness was inflicted or produced. It attempts to answer the broad question of “how” work injuries and illnesses occurred.

The BLS event or exposure classification structure comprises seven divisions:

- Contact with objects or equipment
- Falls
- Bodily reaction and exertion
- Exposure to harmful substances or environments
- Transportation accidents
- Fires and explosions
- Assaults and violent acts

Many injury-producing incidents, however, do not fall neatly into one of these divisions because the incidents are composed of a series of events. In those instances, one might capture information on a microevent but not on the overall incident that really merits prevention efforts. To illustrate, consider what occurs in a traffic accident: A car slides on the ice, hits the guardrail, crosses the median strip, and collides with a truck. The driver of the car has several injuries from striking parts of the car and being struck by broken glass.

If a microevent—such as hitting the windshield or being struck by flying glass—were coded within “contact with objects and equipment,” then the fact that the person was in a traffic accident, which was the fundamental reason for the injuries, would be missed.

To avoid such omissions, the code structure's rules of selection give certain primary events precedence over other events associated with them. These primary events, in order of precedence, include assaults and violent acts, transportation accidents, fires, and explosions.

Assaults and violent acts include cases in which a person was injured or made ill by intentional assaults or by violent, harmful actions of unknown intent. Usually, injuries involving normal worksite tasks of coworkers are considered accidental, rather than intentional or of unknown intent, and are classified elsewhere. For example, if a worker unintentionally dropped a brick on another worker, the event would be classified "struck by falling object," a detailed category within the division contact with objects or equipment. The assaults division includes days-away-from-work cases resulting from intentional violence, such as shootings during a robbery, rape, and attempted suicide, as well as harmful actions of unknown intent, such as healthcare patients striking their caregivers. Assaults by animals also are included in this division, except for venomous bites and stings, which are classified in the division "exposure to harmful substances or environments."

Transportation accidents cover events involving transportation vehicles, powered industrial vehicles, or powered mobile industrial equipment in which at least one vehicle (or piece of mobile equipment) is in normal operation and the injury/illness was due to collision or other type of traffic accident, loss of control, or a sudden stop, start, or jolting of a vehicle, regardless of the location of the event. This division contains very detailed information on many transportation incidents, including the direction and location of vehicles prior to collision; various kinds of noncollision incidents, the location of pedestrians struck by vehicles; and different types of railway, water, and aircraft incidents. Some incidents involving vehicles are not classified as transportation accidents. For example, falls from vehicles not in motion usually are classified as falls from nonmoving vehicle and workers struck by rising forklifts are coded struck by object, unless the impact also was due to the travel of the vehicle.

Fires and explosions have precedence over all other events and exposures except assaults and violent acts and transportation accidents. Accordingly, they include cases in which the person fell, jumped, inhaled a harmful substance, or was struck by or struck against an object as a result of a fire or explosion. Most fires included in this division either result from the unintended ignition of an object or substance, or become uncontrolled after originating at an intentional heat source, such as cooking oil. Fires resulting from explosions and those that cause explosions are coded as fires, because fires take precedence over explosions. An explosion is defined as a rapid expansion, outbreak, bursting, or upheaval, either unintentional or intentionally set. The category includes large explosions, such as a tank car, and small explosions, such as aerosol cans. For example, a hot water pressure system that explodes and burns a worker is classified as an explosion, taking precedence over contact with temperature extremes, a category in the division of exposure to harmful substances and environments.

Contact with objects and equipment applies to injuries produced by contact between the injured person and the source of the injury, except when contact was due to falls, transportation accidents, fires, explosions, assaults, or violent acts. Six categories are included in this division:

- "Struck against objects" applies to injuries produced by forcible contact or impact when the motion producing the contact is primarily that of the injured person, such as a worker bumping into a file cabinet.
- "Struck by object" includes cases in which the motion producing the contact is primarily that of the source of injury rather than the person, such as a nail discharged from a nail gun.
- "Caught in or compresses by equipment or objects" includes injuries resulting from being caught in running equipment or machinery as well as in rolling, sliding, and shifting objects.
- "Caught in or crushed in collapsing materials" includes cases involving landslides, cave-ins, engulfments, and collapsing structures.
- "Rubbed or abraded by friction or pressure" mostly contains cases of foreign matter irritating the eye.
- "Rubbed, abraded, or jarred by vibration" are nonimpact cases mostly resulting from vibration of vehicles, mobile equipment, or machinery.

Falls are events in which the injury was produced by impact between the injured person and the source of injury when the motion-producing contact was generated by gravity. They are classified into three broad groupings: Fall to lower level, jump to lower level, and fall on same level. Each of these groupings contains more specific codes, such as fall from roof edge; jump from scaffold; and fall to floor, walkway, or other surface. Jumps are differentiated from falls by the fact that they are controlled and voluntary even if the worker jumped to avoid an uncontrolled fall. A lower level is defined as a point of contact lower than the surface supporting the person at the inception of the fall. Same level signifies a point of contact at or above the surface level supporting the person at the inception of the fall. Excluded from this division are slips, trips, and other cases involving loss of balance that do not result in a fall, as well as falls from a vehicle involved in a transportation incident, as defined in that division.

Bodily reaction and exertion applies to cases, usually nonimpact, in which injury or illness resulted from free bodily motion, from excessive physical effort, or from repetition of a bodily motion. Bodily reaction, one of the division's three major groups, usually includes cases involving musculoskeletal or internal injury or illness resulting from the assumption of an unnatural position, whether from voluntary movements like climbing or from involuntary motions induced by sudden noise, fright, or efforts to recover from slips or loss of balance (not resulting in falls). Overexertion cases involve an outside source of injury or illness (such as a heavy container) against which excessive physical effort was directed (such as lifting or carrying) when the injury or illness occurred. Repetitive motion injuries or illnesses result from bodily motion that imposed stress or strain on some part of the body due to a task's repetitive nature. Three specific categories of repetitive motion are coded: Typing or key entry; repetitive use of tool; and repetitive placing, grasping, or moving objects, except tools. Two other groupings of cases are included in this division: Sustained viewing, such as eye strain from viewing terminal screens, and bodily conditions not elsewhere classified and not attributed to a specific event or exposure, such as heart attacks and strokes.

Exposure to harmful substances or environments includes nonimpact injuries and illnesses resulting from contact with, or exposure to, a condition or substance in the environment. Included in this division are specific major groupings for contact with electric current (such as direct or indirect contact with a machine or wiring); contact with temperature extremes (primarily hot objects or substances such as welding torch flames or roofing tar); exposure to air pressure changes; exposure to caustic, noxious, or allergenic substances, most commonly through skin contact or inhalation; exposure to noise, except for explosions; and exposure to radiation (particularly welding light). Two other groupings of cases also are included in this division: Exposure to traumatic or stressful event, not elsewhere classified (such as witnessing an accident) and oxygen deficiency not elsewhere classified (such as underwater submersion).