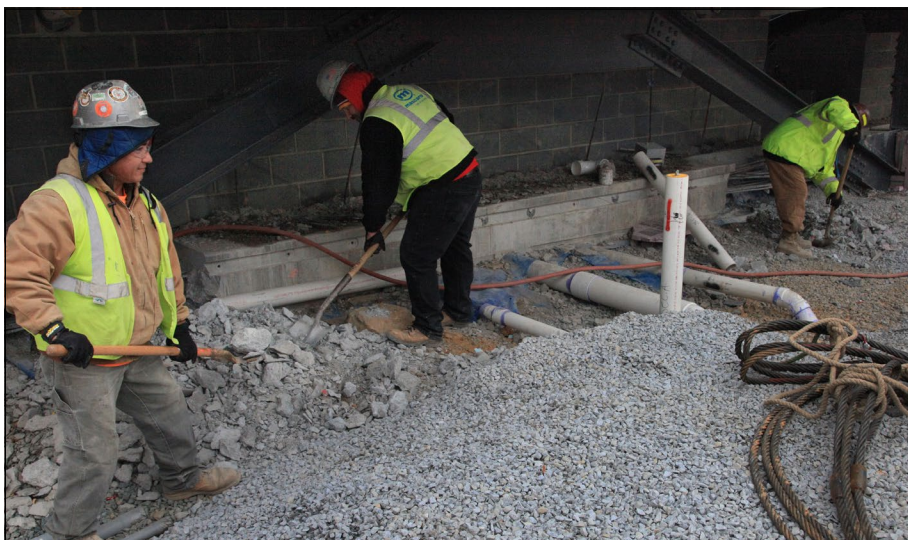


Fatal Injury Trends in the Construction Industry

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OVERVIEW

Construction is one of the most dangerous industries in the United States. [Construction Focus Four](#) hazards (falls, struck-by, electrocutions, and caught-in/between), defined by the Occupational Safety and Health Administration, remain leading fatal threats to workers in the industry. This Data Bulletin summarizes trends in fatal injuries among construction workers using publicly available data from the Census of Fatal Occupational Injuries (CFOI), a data collection from the U.S. Bureau of Labor Statistics (BLS). Due to changes in the injury coding system used by BLS,[†] injury analyses in this report span 2011 to 2019. Fatalities in both private and public construction sectors were included in the analyses. Fatal injuries were stratified by major demographics and the Construction Focus Four. Injury risk was measured by the number of injuries per 100,000 full-time workers (FTEs; assuming a full-time worker works 40 hours per week, 50 weeks per year). The Current Population Survey (CPS), another BLS data collection, was the source of employment estimates and the denominators for injury rate estimates. Definitions for fatal injury categories are included at the end of this report.



THIS ISSUE

This issue examines fatal injuries in construction from 2011 through 2019, identifying trends by Hispanic ethnicity, age, and injury cause and source.

KEY FINDINGS

The number of fatal injuries in construction reached 1,102 in 2019, the highest level since before 2011.
Chart 3

In 2019, 374 Hispanic construction workers died at workplaces, surging nearly 27% from 2018 and 90% since 2011. For comparison, Hispanic employment in construction rose 55% from 2011 to 2019.
Charts 1,3

Falls to a lower level caused 401 fatal injuries in 2019, a 25% growth from 2018.
Charts 6,7

Nearly two-thirds of fatal construction injuries in 2019 were caused by the Construction Focus Four hazards.
Charts 3,6

Roofs were the primary source of 146 fatal injuries in 2019 compared to 92 in 2011, and escalated more than 28% from 114 deaths in 2018.
Chart 8

NEXT DATA BULLETIN

Trends of fatal and nonfatal struck-by injuries in the construction industry

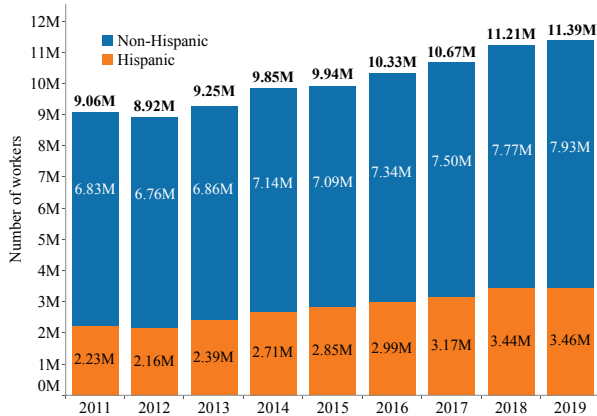
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Numbers in text and charts were calculated by the CPWR Data Center.

[†]In 2011, the CFOI switched to version 2.01 of the Occupational Injury and Illness Classification System (OIICS).
Cover photo: Earl Dotter for CPWR.

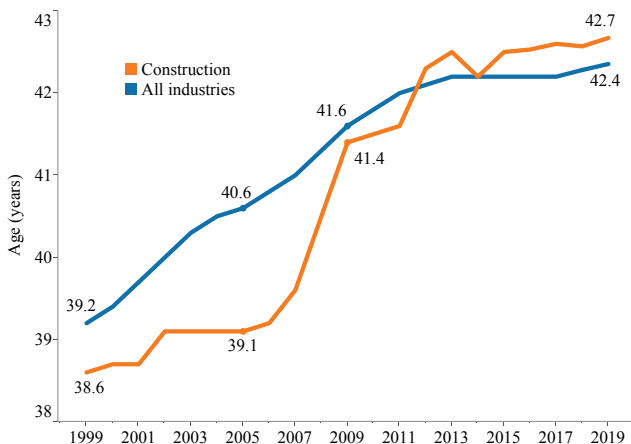
In 2019, construction employment climbed to 11.4 million workers, an increase of more than 25% since 2011 (chart 1). Employment growth was even more pronounced among Hispanic construction workers, rising by more than half (55%) during this period.

1. Number of construction workers, by Hispanic ethnicity, 2011-2019



Since 1999, the average age of the American workforce overall increased by 3.2 years, compared to an increase of 4.1 years in construction (chart 2). In 2019, the average worker age in construction was slightly higher than in all industries combined (42.7 years versus 42.4 years).

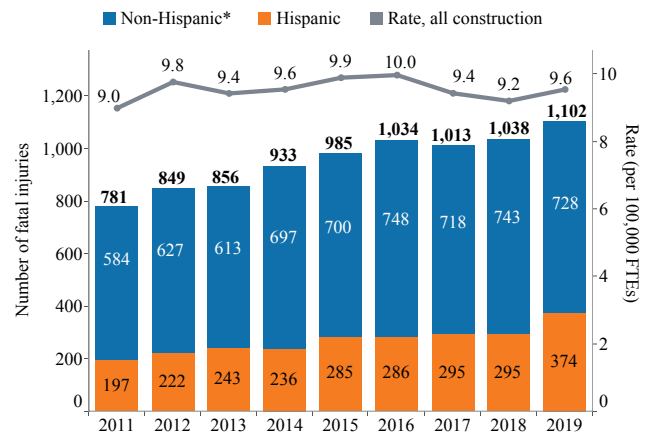
2. Average age of workers, construction versus all industries, 1999-2019



In 2019, the number of fatal injuries in construction rose to 1,102, a 41.1% increase since 2011 (chart 3). However, the rate of fatal injuries stayed relatively constant, hovering between 9 and 10 fatal injuries per 100,000 FTEs during this period.

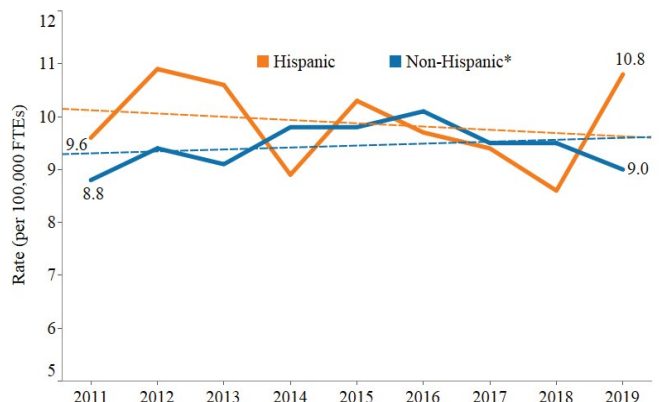
The increase in fatalities was especially pronounced for Hispanic construction workers, surging 89.8% from 2011 to 2019, and was significantly higher than their employment gains (see chart 1). The fatal injury rate among Hispanic workers also spiked in 2019 at 10.8 deaths per 100,000 FTEs, a 25.6% rise from 2018 (chart 4). Despite fluctuation between 2011 and 2019, the fatal injury rate among Hispanic workers had a downward trend overall, and the gap in death rates between Hispanic and non-Hispanic construction workers narrowed during the study period.

3. Fatal injuries in construction, by Hispanic ethnicity, 2011-2019



*Cases without ethnicity information categorized as non-Hispanic.

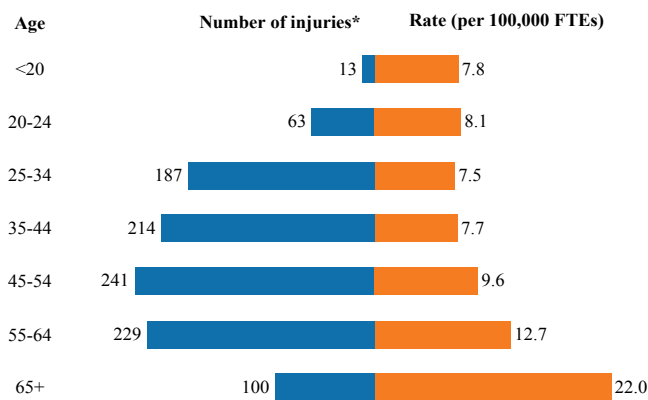
4. Rate of fatal injuries in construction, by Hispanic ethnicity, 2011-2019



*Cases without ethnicity information categorized as non-Hispanic.

On average, middle-aged construction workers (45-64 years) accounted for the most fatal injuries between 2016 and 2019 (chart 5). However, the 65+ age group had the highest rate of fatal injuries at 22 deaths per 100,000 FTEs, over double the rate for workers under 55 years (≤ 9.6 deaths per 100,000 FTEs).

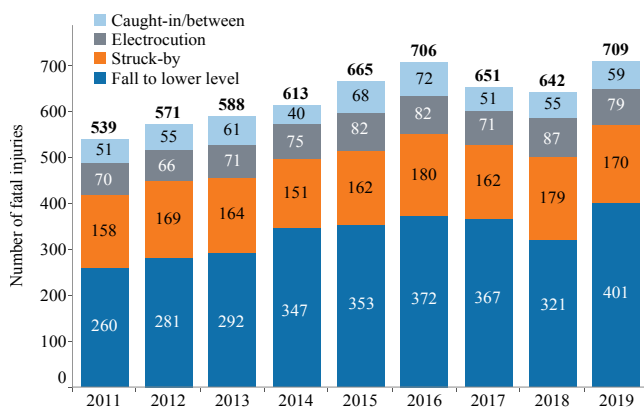
5. Number and rate of fatal injuries in construction, by age group, average of 2016-2019



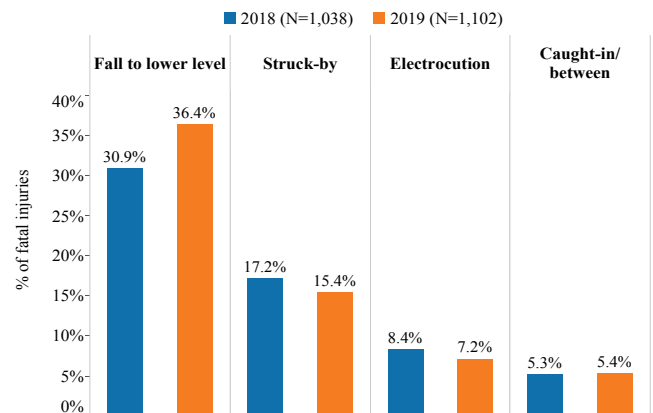
*Cases without age information are excluded.

The “Construction Focus Four” hazards defined by OSHA caused 709 deaths in 2019, or 64.3% of all construction fatalities that year (charts 6 and 7). Fatal falls to a lower level climbed to 401 in 2019, accounting for more than one in three (36.4%) construction deaths that year, a 25% increase compared to 2018. In contrast, the number and proportion of fatalities from struck-by incidents (170; 15.4%) and electrocutions (79; 7.2%) decreased from 2018 to 2019, while the number of fatalities due to caught-in/between incidents (59; 5.4%) remained relatively constant.

6. Number of fatal injuries caused by Construction Focus Four, 2011-2019

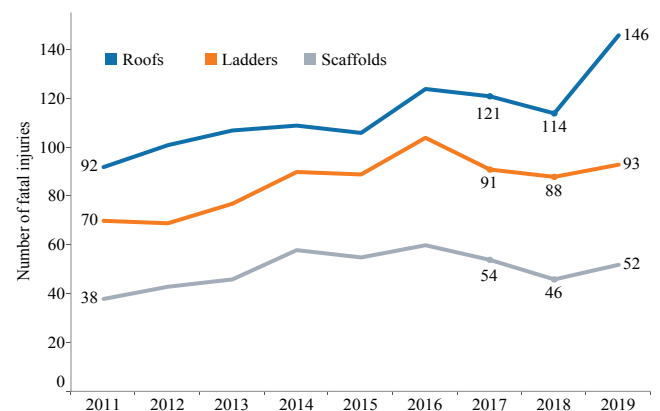


7. Percentage of fatalities caused by Construction Focus Four, 2018 versus 2019



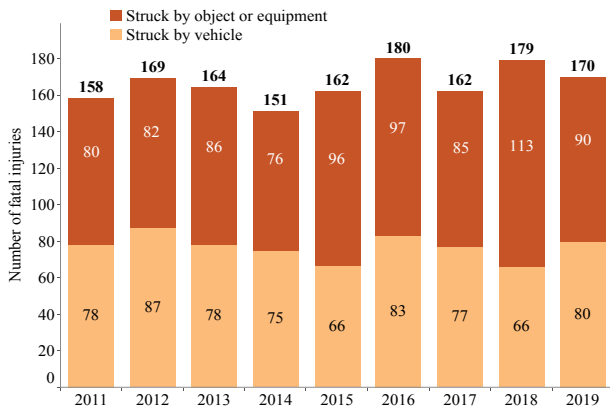
The number of construction fatalities for which roofs, ladders, or scaffolds were the primary source grew from 2011 to 2019 (chart 8), consistent with the increase in fatal falls to a lower level over these years (see chart 6). Roofs were involved in more construction fatalities than ladders or scaffolds each year of the time period. Moreover, deaths involving roofs spiked in 2019 at 146, a 28.1% increase from 2018.

8. Number of fatal injuries in construction, by selected primary source, 2011-2019



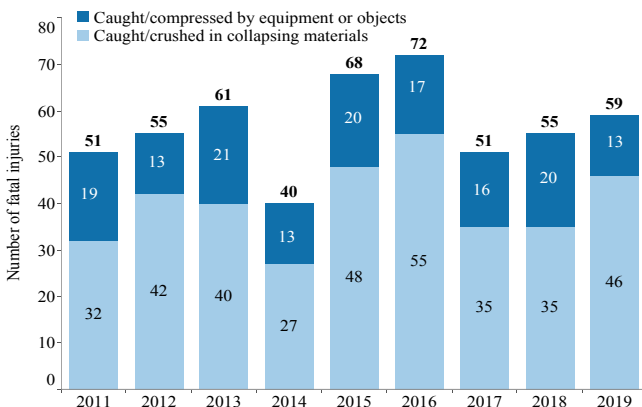
The number of struck-by fatalities rose 7.6% from 2011 to 2019 (chart 9). In 2019, the majority (52.9%) of struck-by fatalities involved objects or equipment, most commonly falling materials (supplemental chart S4). While the number of struck-by fatalities involving objects or equipment decreased 20.4% (23 fewer deaths) from 2018 to 2019, the number of struck-by fatalities involving a transport vehicle increased 21.2% (14 more deaths) during the same period.

9. Composition of fatal struck-by injuries in construction, 2011-2019



The number of caught-in/between fatalities fluctuated between 40 and 72 deaths each year from 2011 to 2019 (chart 10). More than two-thirds (70.3%) were caused by being struck, caught, or crushed in collapsing materials. From 2018 to 2019, the number of caught-in/between fatalities involving collapsing materials grew 31.4% (11 more deaths), while the number of such fatalities involving equipment or objects lowered 35% (7 fewer deaths).

10. Composition of fatal caught-in/between injuries in construction, 2011-2019



The number of fatal injuries in construction has continued to grow, reaching its highest level in 2019 since 2011. Fatalities among Hispanic construction workers are particularly concerning, with the number of fatal injuries rising about 90% from 2011 to 2019, outpacing their employment growth in the industry during the period.

Falls to a lower level were largely responsible for the increase in construction fatalities in 2019. Continued and enhanced efforts are critical to preventing falls among construction workers. Employers must proactively address fall hazards and provide sufficient protection, such as personal fall arrest systems (PFAS) for workers exposed to fall hazards. While this report is unable to analyze fatal falls by demographics due to data limitations, our previous research has found that Hispanic workers and older workers are more likely to suffer from fall injuries. Given growing Hispanic employment and increased fatalities in this worker group, employers should ensure that safety trainings effectively reach Hispanic workers, especially young and new immigrants, including meeting their cultural and bilingual needs. Similarly, work redesign and retraining may be necessary to improve the safety of older workers and sustain their employability so that their talents, knowledge, and experience can continue to benefit the construction industry.

CPWR manages a series of websites and training materials that address specific hazards and audiences, including [Construction Safety & Health Network](#), [Construction Solutions](#), [Hazard Alert cards](#), [Stop Construction Falls](#), and [Toolbox Talks](#). [OSHA](#) and [NIOSH](#) also provide program recommendations and safety resources to address construction hazards. These materials are available for free access and download.

ACCESS THE CHARTS & MORE

View the [charts](#) (including supplement charts) in PowerPoint and the [data](#) underlying the charts in Excel. Downloading will start when you click on each link.

DEFINITIONS

Primary source – Object, substance, or equipment that was responsible for an injury or that precipitated an event or exposure.

Focus Four Events/Exposures (i.e., Injury Causes):

1. Fall to a lower level (OIHCS 43*) – Injury caused by impact between a falling person and lower surface (e.g., fall from a roof to a ground level; fall from a ground level into an opening or body of water; fall from a collapsing structure).

2. Struck-by incident (OIICS 62* or 24*) – Injury in which a person is struck by a vehicle, object, or equipment. This includes:

A. Struck-by object or equipment (OIICS 62*)

- a. *Struck-by powered, non-transport vehicle (OIICS 621*)* – Injury in which a person is struck by a non-transport vehicle or mobile equipment, such as a forklift.
- b. *Struck-by falling object or equipment (OIICS 623*)* – Injury caused by a falling source, excluding a collapsing structure.
- c. *Struck by other object or equipment* – Injury in which a person is struck by other objects or equipment, not covered under event codes 621* or 623* (e.g., struck by a rolling or flying object).

B. Struck-by vehicle (OIICS 24*) – Pedestrian injury caused by a transport vehicle.

3. Electrocution (OIICS 51*) – Injury due to contact with electricity, including direct contact (e.g., touching a live wire) and indirect contact (e.g., contact with pipe touching power line).

4. Caught-in/between incident (OIICS 64* or 65*) – Injury in which a person or part of a person's body is caught in or compressed by equipment or objects, or is caught in or crushed by collapsing materials. This includes:

A. Caught in or compressed by equipment or objects (OIICS 64*)

- a. *Caught in running equipment or machinery (OIICS 641*)* – Injury in which a person is caught or crushed in running equipment (e.g., caught in automatic gate).
- b. *Caught in or compressed by other equipment or objects (OIICS 640, 642, 643, 644, or 649)* – Injury in which a person is compressed or pinched between moving or stationary objects or equipment, or is entangled in equipment such as wires.

B. Struck, caught, or crushed in collapsing structure, equipment, or material (OIICS 65*) – Injury in which a person is caught in or crushed by landslides, cave-ins, collapsing structures, or other collapsing materials (e.g., asphyxiations due to trenching cave-ins).

DATA SOURCES

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The CPWR Data Center is part of CPWR–The Center for Construction Research and Training. CPWR is a 501(c)(3) nonprofit research and training institution created by NABTU, and serves as its research arm. CPWR has focused on construction safety and health research since 1990. The Data Bulletin, a series of publications analyzing construction-related data, is part of our ongoing surveillance project funded by the National Institute for Occupational Safety and Health (NIOSH).

Besides cpwr.com, visit CPWR's other online resources to help reduce construction safety and health hazards:

- Choose Hand Safety
<https://choosehandsafety.org/>
- Construction Safety and Health Network
<https://safeconstructionnetwork.org/>
- Construction Solutions
<https://www.cpwrconstructionsolutions.org/>
- Construction Solutions ROI Calculator
<https://www.safecalc.org/>
- COVID-19 Construction Clearinghouse
<https://covid.elcosh.org/index.php>
- COVID-19 Exposure Control Planning Tool
<https://www.covidcpwr.org>
- Electronic Library of Construction Occupational Safety and Health
<https://www.elcosh.org/index.php>
- Exposure Control Database
<https://ecd.cpwrconstructionsolutions.org/>
- Safety Climate Assessment Tool (S-CAT)
<https://cpwr.com/safetyclimate>
- Safety Climate Assessment Tool for Small Contractors (S-CAT^{SC})
<https://www.cpwr.com/scat-sc>
- Stop Construction Falls
<https://stopconstructionfalls.com/>
- Work Safely with Silica
<https://www.silica-safe.org/>

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