

New Trends of Fatal Falls in the Construction Industry

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OVERVIEW

The seventh annual [National Safety Stand-Down](#) is taking place this month despite the COVID-19 pandemic. This event is part of the [National Campaign to Prevent Falls in Construction](#) that was launched in 2012 by the National Occupational Research Agenda (NORA) Construction Sector Council, CPWR – The Center for Construction Research and Training, the National Institute for Occupational Safety and Health (NIOSH), and the Occupational Safety and Health Administration (OSHA). The campaign aims to raise public awareness of fall hazards and to reinforce the importance of fall prevention. To support the campaign, this special issue of the Data Bulletin reports trends of fatal falls in the construction industry, highlighting changes in fatal falls to a lower level in recent years based on the most recent data. The fatality numbers were obtained from the U.S. Bureau of Labor Statistics (BLS) Census of Fatal Occupational Injuries (CFOI). Construction employment was estimated from the Current Population Survey (CPS). To calculate injury rates, employment was adjusted for the number of hours worked (full-time equivalent or FTE), assuming that full-time employees work 2,000 hours per year.



THIS ISSUE

In support of the 2020 National Safety Stand-Down to Prevent Falls in Construction, this special issue reports recent trends of fatal falls in the construction industry.

KEY FINDINGS

In 2018, the number of fatal falls in construction decreased to 340 from 389 in 2017 despite an increase in overall fatalities.

Chart 2

The rate of fatal falls to a lower level in construction dropped to 2.8 per 100,000 full-time equivalent (FTE) workers in 2018, its lowest point since 2003.¹

Chart 4

Both the rate and number of fatal falls to a lower level in construction decreased consecutively in 2017 and 2018, dropping a total of 20.6% and 13.7%, respectively.

Chart 5

The number of fatal injuries associated with the three primary sources of fall hazards (roofs, ladders, and scaffolds) all decreased from 2016 to 2018.

Chart 6b

From 2016 to 2018, fatal falls to a lower level dropped 15.4% in the Roofing subsector, but increased 6.6% in Residential Building Construction.

Chart 8b

NEXT DATA BULLETIN

Value Produced by the Construction Industry During the COVID-19 Pandemic

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¹The U.S. Bureau of Labor Statistics (BLS) converted from the Standard Industrial Classification (SIC) system to the North American Industry Classification System (NAICS) in 2003.

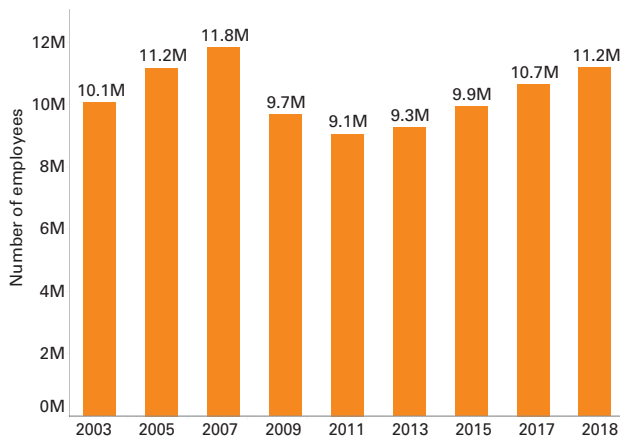
Photo courtesy: Occupational Safety and Health Administration (OSHA)

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

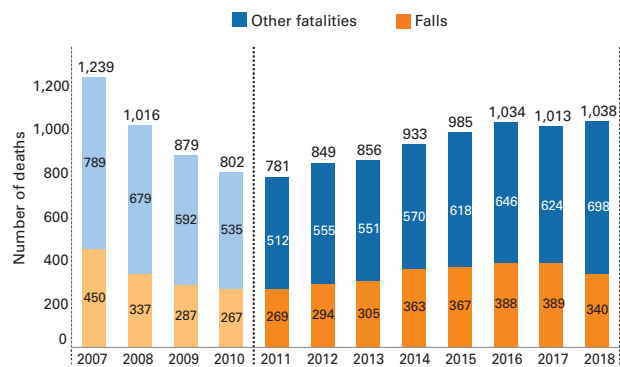
Construction employment has increased steadily since 2011, reaching 11.2 million in 2018 and nearing its peak pre-recession level of 11.8 million in 2007 (chart 1).

Following the growth in employment, the total number of construction fatalities in 2018 climbed to 1,038, the highest level since 2011 (chart 2). However, the number of fall fatalities decreased by 12.6% between 2017 and 2018, from 389 to 340.

1. Construction employment in the United States, 2003-2018 (selected years)



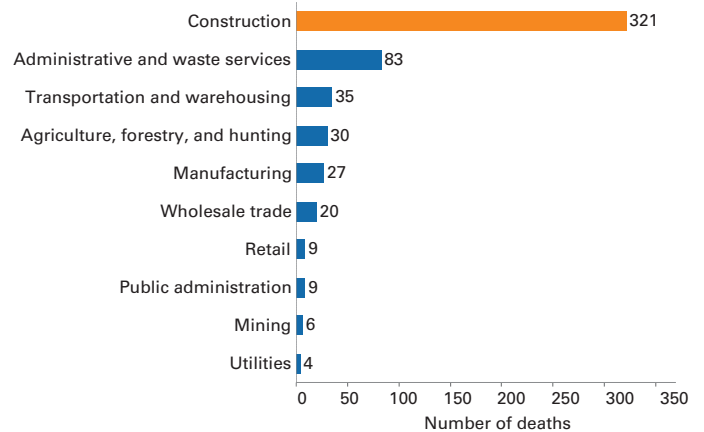
2. Number of fatalities in construction, falls and other fatalities, 2007-2018*



*In 2011, the CFOI switched to version 2.01 of the Occupational Injury and Illness Classification System (OIICS), which categorizes slips, trips, and falls together.

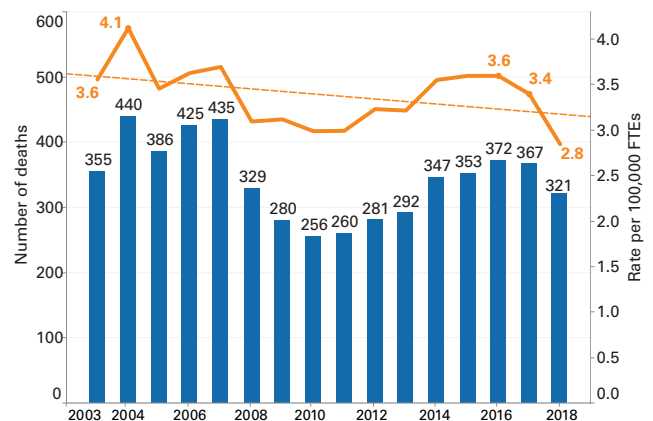
Most fatal falls in construction were to a lower level. In 2018, 321 of the 340 fatal falls were to a lower level, more than any other major industry sector (chart 3).

3. Number of fatal falls to a lower level, by major industry, 2018

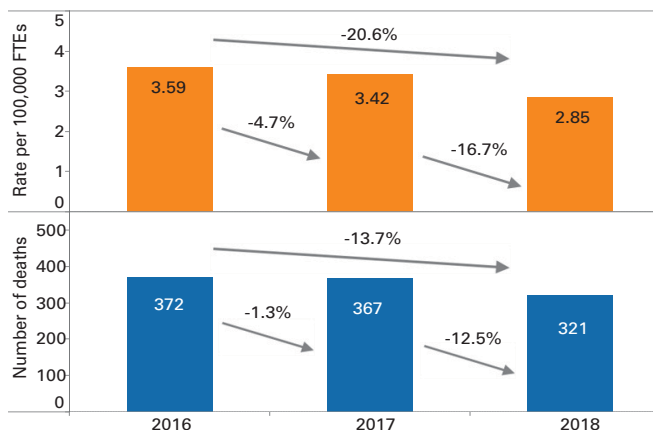


Nevertheless, both the rate and number of fatal falls to a lower level in construction decreased since 2016. In 2018, the rate dropped to 2.8 per 100,000 full-time equivalent (FTE) workers, its lowest point since 2003¹ (chart 4). Compared to 2016, the rate and number of fatal falls to a lower level in construction decreased by 20.6% and 13.7% in 2018, respectively (chart 5).

4. Number and rate of fatal falls to a lower level in construction, 2003-2018

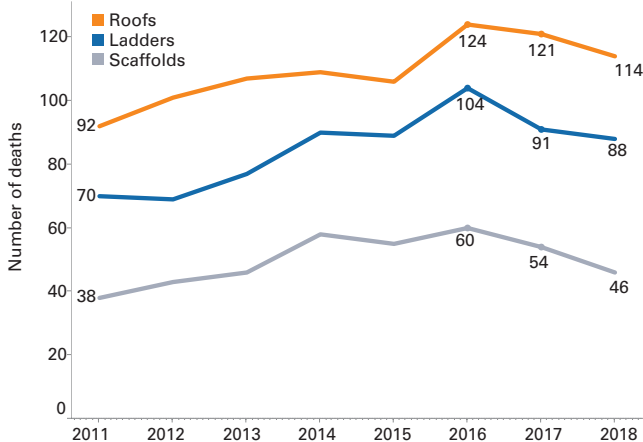


5. Changes in fatal falls to a lower level in construction, 2016-2018

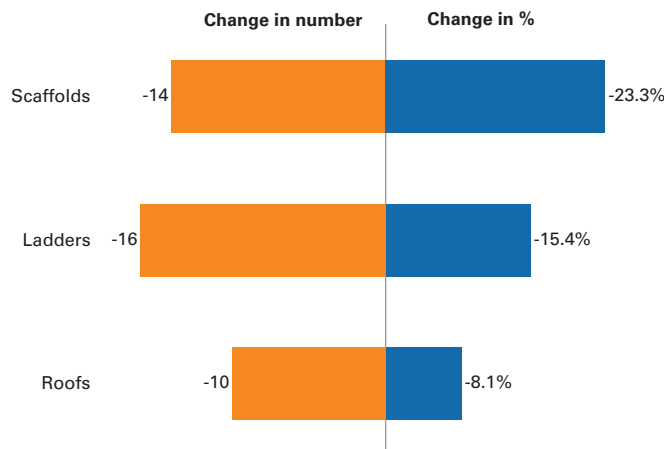


Roofs, ladders, and scaffolds are the three major sources of [fatal falls in construction](#). Similar to the trend of fatal falls, the number of fatalities associated with these three sources all decreased in recent years (chart 6a). Between 2016 and 2018, the largest reduction was among fatalities involving scaffolds (-23.3%), followed by ladders (-15.4%), and then roofs (-8.1%; chart 6b).

6a. Number of fatalities in construction, by selected primary source, 2011-2018

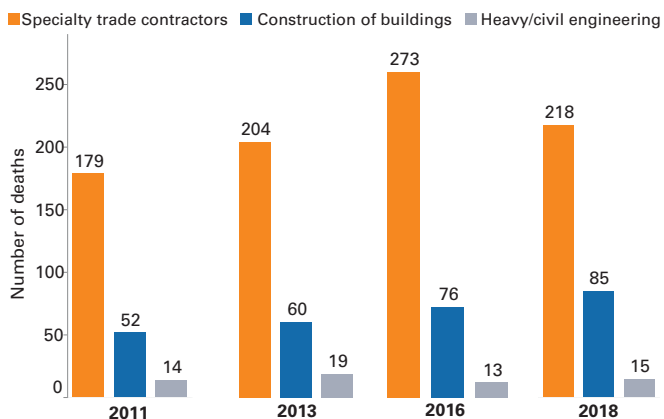


6b. Primary sources of fatal falls in construction, changes from 2016 to 2018

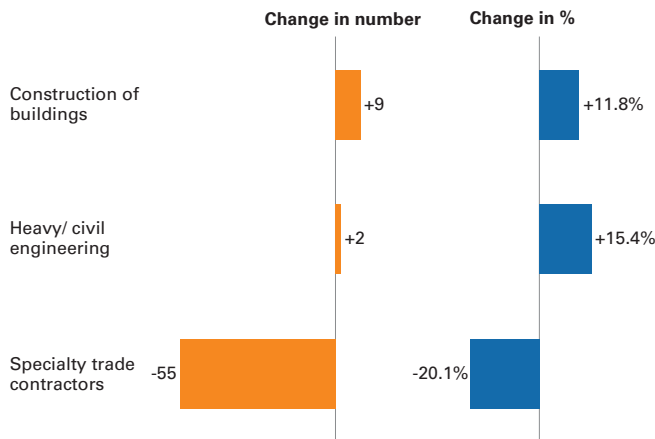


Most fatal injuries due to falls to a lower level in construction occurred in Specialty Trade Contractors (NAICS 238)—one of the three major subsectors in the industry. In 2018, Specialty Trade Contractors reported 218 deaths from falls to a lower level, accounting for the largest proportion of such fatal falls in the construction industry (chart 7a). On the other hand, such fatalities were lowest in Heavy/Civil Engineering Construction (NAICS 237). The number of fatal falls to a lower level in Specialty Trade Contractors decreased substantially between 2016 and 2018 (-20.1%), while it increased in Heavy/Civil Engineering Construction (+15.4%) and Construction of Buildings (+11.8%; chart 7b).

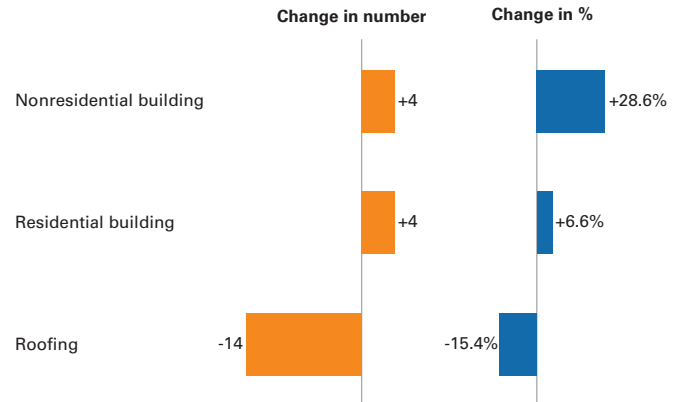
7a. Number of fatal falls to a lower level, by major construction subsector, 2011-2018 (selected years)



7b. Number of fatal falls to a lower level in construction, by major subsector, changes from 2016 to 2018



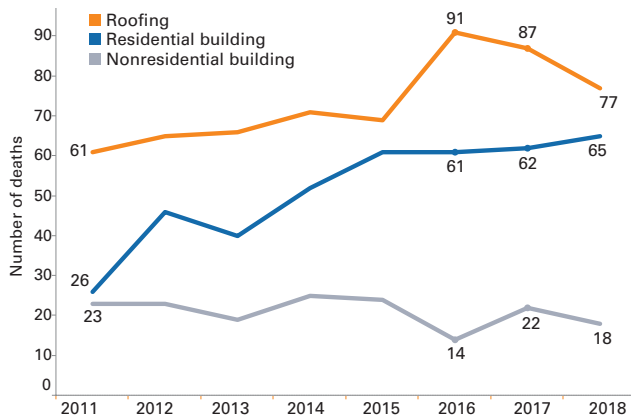
8b. Number of fatal falls to a lower level among construction subsectors with high fall risk, changes from 2016 to 2018



Roofing Contractors (NAICS 23816) typically have [the highest number of fatal falls](#). The number of fatal falls to a lower level jumped to 91 in 2016 for Roofing (chart 8a), and then decreased in both 2017 and 2018, dropping 15.4% overall in two years (chart 8b). In contrast, such fatalities in Residential Building Construction (NAICS 23611) increased to 65 in 2018, 6.6% higher than 2016 (61 deaths), and approximately 2.5 times higher than 2011 (26 deaths).

The number of such fatal falls has fluctuated in Nonresidential Building Construction (NAICS 2362) since 2011, and increased from 14 deaths in 2016 to 18 deaths in 2018.

8a. Number of fatal falls to a lower level among construction subsectors with high fall risk, 2011-2018



While construction employment has continued to increase, both the number and rate of fatalities from falls to a lower level – the leading cause of construction fatalities—dropped in 2017 and again in 2018. The rate of fatal falls to a lower level decreased more than 20% over these two years, reaching its lowest point since at least 2003. In particular, the number of fatal falls to a lower level fell 15% in Roofing Contractors, the construction subsector with the highest risk of fatal falls. Reductions from 2016 to 2018 were also observed in fatalities associated with all three primary sources of fall injuries, and the drop in scaffolding fatalities was significant. These findings suggest that falls are preventable, and ongoing fall prevention efforts, including the National Campaign to Prevent Falls in Construction, are effective.

Although the findings are encouraging, the data show that construction remained the industry with the largest number of fatal falls to a lower level among all major industry sectors, and the number of fatal falls in Residential Construction continued to grow. To protect workers from fall injuries, construction contractors should PLAN ahead, PROVIDE the right equipment to workers, and TRAIN workers to use the equipment safely not just during the Stand-Down week of September 14-18, but all year long as part of the ongoing national campaign. To assist construction employers in fall prevention, CPWR and its partners have developed numerous free materials and resources that can be found on the Falls Campaign website: <https://stopconstructionfalls.com/about-the-campaign/>.

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.

DATA SOURCE

U.S. Bureau of Labor Statistics, 2003-2018 Census of Fatal Occupational Injuries (CFOI)

U.S. Bureau of Labor Statistics, 2003-2018 Current Population Survey (CPS)

REFERENCES

CPWR [2020]. Stop Construction Falls <https://stopconstructionfalls.com/about-the-campaign/> (Accessed September 2020).

CPWR [2019]. Trends of fall injuries and prevention in the construction industry. <https://www.cpwr.com/wp-content/uploads/2020/06/Quarter2-QDR-2019.pdf> (Accessed September 2020).

CPWR DATA CENTER'S RESEARCH ON FALL INJURIES IN CONSTRUCTION (SELECTED)

Data Reports:

CPWR [2018]. Fatal injuries among small construction establishments. https://www.cpwr.com/wp-content/uploads/publications/publications_Quarter3-QDR-2018_0.pdf

CPWR [2017]. Fall injuries and prevention in the construction industry. https://www.cpwr.com/wp-content/uploads/publications/publications_Quarter1-QDR-2017.pdf

CPWR [2015]. Fatal and nonfatal injuries among construction trades between 2003 and 2014. https://www.cpwr.com/wp-content/uploads/publications/publications_Third-Quarter-QDR-final_2.pdf

CPWR [2014]. New trends in fatalities among construction workers. https://www.cpwr.com/wp-content/uploads/publications/publications_New-Trends-in-Fatalities-among-Construction-Workers.pdf

Peer-Reviewed Journal Articles

Dong XS, Largay JA, Choi SD, Wang X, Cain CT, Romano N. [2017]. Fatal falls and PFAS use in the construction industry: Findings from the NIOSH FACE reports. *Accident Analysis and Prevention*, May;102:136-43.

Dong XS, Largay JA, Wang X, Cain CT, Romano N. [2017]. The construction FACE database - codifying the NIOSH FACE reports. *Journal of Safety Research*, Sep;62:217-25.

Dong XS, Wang X, Largay JA, Lippy B, Cain CT, Stafford EP, Platner JW. [2016]. Chapter 4: Fall risk characteristics in the construction industry. In Hongwei Hsiao (Ed.), *Fall Prevention and Protection: Principles, Guidelines, and Practices* (Human Factors and Ergonomics Series). CRC Press, Taylor & Francis Group, pages 41-61.

Dong XS, Largay JA, Wang X, Windau JA. [2014]. Fatalities in the construction industry: Findings from a revision of the BLS Occupational Injury and Illness Classification System. *Monthly Labor Review*, <https://www.bls.gov/opub/mlr/2014/article/fatalities-in-the-construction-industry.htm>

Dong XS, Wang X, Largay JA, Platner JW, Stafford E, Cain CT, Choi SD. [2014]. Fatal falls in the U.S. residential construction industry. *American Journal of Industrial Medicine*, Sep;57(9):992-1000.

Dong XS, Ringen K, Welch L, Dement J. [2014]. Risks of a lifetime in construction, Part I: traumatic injuries. *American Journal of Industrial Medicine*, Sep;57(9):973-83.

Dong XS, Choi SD, Borchardt JG, Wang X, Largay JA. [2013]. Fatal falls from roofs among U.S. construction workers. *Journal of Safety Research*, Feb;44:17-24.

Dong XS, Wang X, Daw C. [2012]. Fatal falls among older construction workers. *Human Factors*, Jun;54(3):303-15.

Dong XS, Fujimoto A, Ringen K, Men Y. [2009]. Fatal falls among Hispanic construction workers. *Accident Analysis and Prevention*, Sep;41(5):1047-52.

ABOUT THE CPWR DATA CENTER

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
<http://choosehandsafety.org/>
- Construction Safety and Health Network
<https://safeconstructionnetwork.org/>
- Construction Solutions
<http://www.cpwrconstructionsolutions.org/>
- Construction Solutions ROI Calculator
<http://www.safecalc.org/>
- COVID-19 Construction Clearinghouse
<http://covid.elcosh.org/index.php>
- Exposure Control Database
<http://ecd.cpwrconstructionsolutions.org/>
- Stop Construction Falls
<http://stopconstructionfalls.com/>
- The Electronic Library of Construction Occupational Safety and Health
<http://www.elcosh.org/index.php>
- Work Safely with Silica
<http://www.silica-safe.org/>

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