

The Construction Chart Book

THE U.S. CONSTRUCTION INDUSTRY AND ITS WORKERS



eChart Book 2025
SEVENTH EDITION

CPWR  **THE CENTER FOR CONSTRUCTION
RESEARCH AND TRAINING**

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THE CONSTRUCTION CHART BOOK

The U.S. Construction Industry and Its Workers

Seventh Edition

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CPWR – the research and training arm of NABTU – is uniquely situated to serve workers, contractors, and the scientific community. A core function of CPWR’s work is to improve safety and health in the construction industry. This volume is part of that effort.

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For questions, contact datacenter@cpwr.com.

This chart book is posted at www.cpwr.com/research/data-center/construction-chart-book/.

FOREWORD

The Construction Chart Book: The U.S. Construction Industry and Its Workers has been the most comprehensive source of construction statistics since its launch in the 1990s. Developed through funding from the National Institute for Occupational Safety and Health (NIOSH), the Chart Book uses a wide range of publicly available data sources to explore trends and identify issues affecting construction workers and the industry.

This edition—the 7th—continues to cover the topics that formed the core of previous Chart Books, including construction industry economics, demographics, employment trends, exposures, hazards, and injuries/illnesses. This edition also highlights new issues, such as the COVID-19 pandemic, that have impacted the construction industry and workforce in the last five years.

Among the key findings:

- Employment in construction continues to grow, increasing 31.6% from 2011 to 2023. Chapter 10
- Hispanic construction workers account for almost a third of the workforce, increasing 18.1% from 2020 to 2022. Chapter 16
- The number of construction workers 55 years or older increased 73.3% from 2011 to 2024. Chapter 15
- While the number of self-employed construction workers has reached 2.7 million, they remain unprotected by OSHA safety and health standards. Chapter 23
- Falls continue to be the leading source of fatal work injuries, with a 12.9% increase in the rate of fatal falls, slips, and trips from 2011 to 2022. Chapter 42
- Musculoskeletal disorders remain a substantial problem, with 33,200 workers missing work from 2021 to 2022 because of them. Chapter 45

The 7th edition does more than update and expand data—it also offers new opportunities to understand it. [Interactive Dashboards with Dynamic Key Findings](#), with filters (specific years, for example) that update key findings and charts are available for most chapters. Because the Interactive Chart Book lives online, its data can be updated whenever new information becomes available.

The many improvements in the 7th edition have not changed the goal of the Chart Book, however. It continues to provide people across the construction industry with timely data that helps the industry flourish and enables every worker to come home safely every day.

CHRISTINA TRAHAN CAIN
Executive Director, CPWR

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INTRODUCTION

The Construction Chart Book, now in its 7th edition, has been providing people across the industry with accurate and timely construction statistics since 1997. To meet changing needs and practices, the Chart Book has evolved, adding data sources and introducing formats to make it an even more valuable resource.

Presented in 54 chapters and offering more than 200 charts and tables, the new edition consists of five sections. The *Industry, Business, and Owner* chapters present trends on construction establishments, construction spending, and business owners. The *Employment, Income, and Benefit* chapters examine data on groups such as aging, Hispanic, and women workers, as well as information on retirement plans and health insurance coverage.

Safety and health issues are covered in the remaining three sections. The *Injuries, Illnesses, and Other Health Topics* chapters include detailed information on fatal, nonfatal, and severe injuries, as well as leading causes of death and health risk factors. *Hazards and Exposure* chapters highlight data about construction sites, such as hazardous environments, lead, and nanomaterials. The *OSHA Enforcement* chapters cover trends of OSHA inspections and citations in the construction industry, including common exposures.

While the 7th edition covers topics similar to previous ones, it adds interactive dashboards that update dynamic key findings and charts through user-selected filters. These interactive pages, corresponding to the traditional chapters and available at cpwr.com/chartbook, not only enable users to meet their specific interests; they also allow data to be updated more regularly. We recommend the interactive pages be reviewed alongside the PDF, as the online pages have more detailed information than could be provided in the short, easy-to-read chapters the Chart Book is known for.

The Chart Book continues to use a variety of sources, many from Federal agencies such as the U.S. Census Bureau, U.S. Bureau of Labor Statistics, and National Center for Health Statistics. For the first time it draws on mortality data from the National Center for Health Statistics National Vital Statistics System, which added industry and occupation data starting with 2020.

To support additional learning, related CPWR resources are listed at the end of chapters. Each chapter also includes relevant information about each data source, such as if it has any major limitations. CPWR's Data Center does all calculations, and numbers presented may not be directly comparable to other publications due to different definitions. Please reach out to datacenter@cpwr.com with any questions.

Pulling and Classifying Data

The **Construction Chart Book** provides and analyzes information on the construction industry, including its labor force, employment trends, and worker safety and health. It draws on multiple data sources, with a description of those used appearing at the end of each chapter. The data in most of these sources requires it to be reduced to the construction industry, which is done using industry and occupation classification systems.

To show construction industry-specific trends, the **Construction Chart Book** uses the North American Industry Classification System (NAICS) and the Census industrial classification systems. Federal statistical agencies use NAICS to classify *establishments* as part of the process for collecting, analyzing, and publishing business economic data (U.S. Census Bureau, 2024). The U.S., Canada, and Mexico jointly developed NAICS to produce comparable statistics among North American countries. As highlighted in Figure 1, NAICS uses a six-digit classification system, with the first two-digits representing the main industry/sector. CPWR refers to the two-digit code as industry, three-digit code as major subsector, and the fourth through sixth digits as detailed subsector (Figure 1). Table 1 (see next page) shows the NAICS six-digit classification structure in construction (note: not all NAICS codes are included). NAICS replaced the Standard Industrial Classification (SIC) system in 1997, with revisions in 2002, 2007, 2012, 2017, and 2022. Revisions allow for tracking new and emerging industries, although significant revisions may impact comparability over time. From 2017 to 2022, there were no changes among the classification structure used for the construction industry (U.S. Census Bureau, n.d.-a).

Figure 1. NAICS and CPWR's Naming Structure

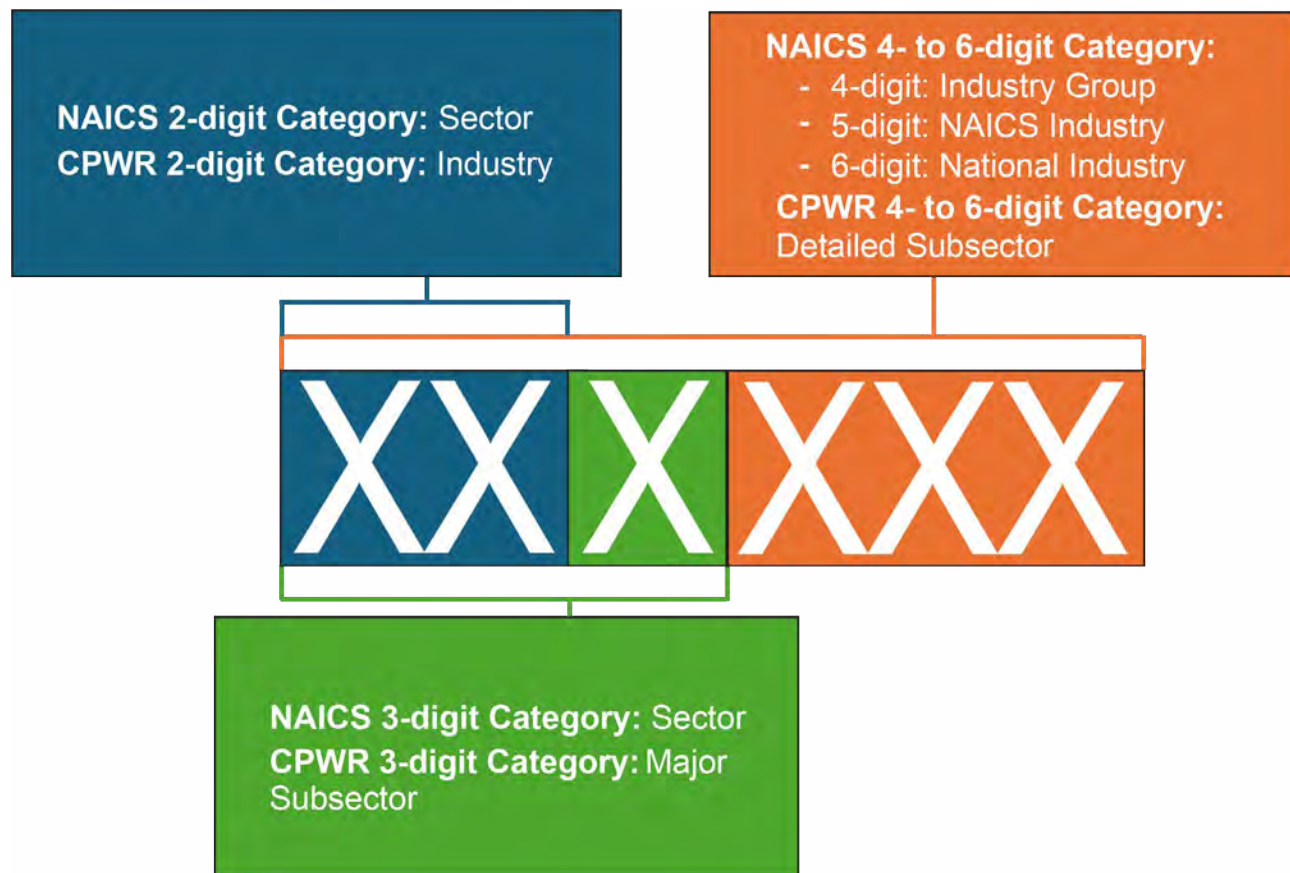


Table 1. Examples of NAICS six-digit classification structure*

Code	Number of Digits	NAICS Sector Category	CPWR Sector Category	Title
23	2	Industry/Sector	Industry	Construction
236	3	Subsector	Major subsector	Construction of Buildings
2361	4	Industry group	Detailed subsector	Residential Building Construction [^]
23611	5	NAICS industry	Detailed subsector	Residential Building Construction [^]
236115	6	National industry	Detailed subsector	New Single-Family Housing Construction
237	3	Subsector	Major subsector	Heavy and Civil Engineering Construction
2371	4	Industry group	Detailed subsector	Utility System Construction
23711	5	NAICS industry	Detailed subsector	Water and Sewer Line and Related Structures Construction
237110	6	National industry	Detailed subsector	Water and Sewer Line and Related Structures Construction
238	3	Subsector	Major subsector	Specialty Trade Contractors
2381	4	Industry group	Detailed subsector	Foundation, Structure, and Building Exterior Contractors
23811	5	NAICS industry	Detailed subsector	Poured Concrete Foundation and Structure Contractors
238110	6	National industry	Detailed subsector	Poured Concrete Foundation and Structure Contractors

*2- to 5-digit codes are comparable between Mexico, Canada, and U.S., while 6-digit codes are specific to the country of origin.

[^]Titles may match across digits if the code is not further split into lower-level detailed subsectors.

While NAICS has been widely adopted, data from household surveys done by the U.S. government code "industry" using the Census Bureau's industrial classification system. Census codes are adapted from NAICS, with approximately 20 sectors and 270 categories (U.S. Census Bureau, n.d.-b). The construction industry is currently coded as 0770, which corresponds to NAICS 23. Similar to NAICS, the Census industrial classification system is updated periodically: construction has been coded as 770 since 2003, but from 1983 to 2002 it was coded as 060. Unlike the NAICS, the Census industrial classification does not have codes for types of construction industries, meaning the industry/sector is the most detailed information available.

To obtain occupation-level information the **Construction Chart Book** uses two primary classification systems: 1) Standard Occupational Classification (SOC) system and 2) Census classification scheme. Federal statistical agencies use the SOC system, which has over 850 detailed occupations, to classify workers into categories for collecting, analyzing, and publishing business economic data (BLS, n.d.). Construction occupations are classified under 47-0000, which includes both construction and extraction occupations. Using 47-0000 Construction and Extraction impacts our ability to fully examine construction workers because 1) for some occupations extraction cannot be separated from construction and 2) it leaves out other occupations that may work within the construction industry (such as welders, truck drivers, administrative professionals) but fall into other occupational groups. To identify all construction workers, we typically examine all occupations that report working in the construction industry. For example, the top two industries for welders (51-4121) are manufacturing and construction, so to be included as a construction

worker, the individual would need to report working in the construction industry (Occupational Information Network, 2024). However, we do not always use this classification approach, and at times, we may include workers who fall under 47-0000 Construction and Extraction Occupations regardless of reported industry due to data availability. Occupation notes will be documented in each chapter as appropriate.

Household surveys use the Census classification scheme, which is based on the SOC system (U.S. Census Bureau, 2020). The Census occupation classification scheme uses 11 major groups and 23 detailed groups that summarize workers by the type of work they do. Construction trades fall under codes 6200-6950, and similar to data using the SOC system, all occupations are typically examined to identify those in other categories who report working in the construction industry.

The codes for the SOC and Census occupation classification schemes can be mapped to each other to produce comparable occupations or occupational categories. For example, SOC Construction and Extraction Occupations correspond to Census codes 6200-6950. Both classification systems allow us to look at individual occupations, as well as combine occupation codes to look at broader occupational groupings (e.g., *craftworkers*).

DEFINITIONS

- **Craftworkers** – Includes occupations that would perform construction work, excluding managerial, professional (architects, accountants, lawyers, etc.), and administrative support workers. This definition aligns with the use of production or blue-collar worker in previous Chart Books. Email datacenter@cpwr.com for occupation codes used.
- **Establishments (in construction)** – A single physical location occupied by a relatively permanent main or branch office in the construction industry (defined as NAICS 23). When multiple activities occur in one place under one ownership, a single establishment is classified by its major activity. The individual construction sites and projects of dispersed activities are not considered to be establishments.

DATA SOURCES AND NOTES

More information on industry and occupation classification can be found at:

- www.census.gov/naics/
- www.census.gov/programs-surveys/cps/technical-documentation/methodology/industry-and-occupation-classification.html

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Occupational Information Network (O*NET). (2024). Welders, Cutters, Solders, and Brazers 51-4121.00. Retrieved July 19, 2024, from www.onetonline.org/link/summary/51-4121.00.

U.S. Bureau of Labor Statistics (BLS). (n.d.). Standard Occupational Classification. Retrieved July 19, 2024, from www.bls.gov/soc/.

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U.S. Census Bureau. (2020). Appendix 10 Occupation Classification. www2.census.gov/programs-surveys/cps/methodology/Occupation%20Codes.pdf.

U.S. Census Bureau. (2024). North American Industry Classification System. www.census.gov/naics/.

Establishments by Payroll Status

Construction *establishments* are classified as either *payroll* or *nonemployer* (with no paid employees or payroll). Historically, nonemployer establishments have accounted for approximately 75% of establishments in construction (CPWR, 2018). From 1997 to 2012, nonemployer establishments, which include independent contractors, increased from 74% to 80% of all construction establishments.

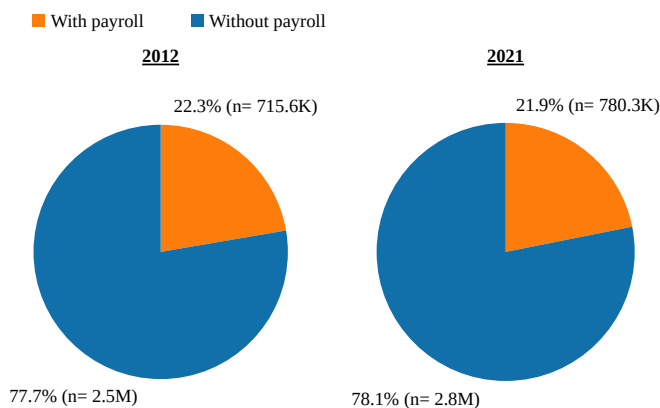
In many industries, the two establishment types are linked, with one report finding that increases in the number of nonemployer establishments in a given year resulted in growth in the number of payroll establishments over the next three years due to independent contractors eventually hiring employees (Moore, 2018). That study estimated that an average county with 1,000 new establishments without payroll would see 350 new payroll establishments in the following three years. This pattern is one reason it is important to understand how establishments with and without payroll change over time: this information can help guide decisions by business owners and government officials, as well as efforts to improve worker safety and health, as outreach methods differ by the type of establishment.

The U.S. Census Bureau produces the County Business Patterns (CBP), an annual series that provides information on establishments with paid employees (payroll), as well as Nonemployer Statistics (NES), an annual series on establishments with no paid employees (nonpayroll; U.S. Census Bureau, n.d.-c, n.d.-b). The CBP-NES Combined Report merges both data sources (U.S. Census Bureau, n.d.-a).

FINDINGS

Three out of four construction establishments are nonemployer (i.e. without payroll; Chart 2a). In 2021, there were 2.8 million (M) nonemployer establishments in construction, a 12.0% increase from the 2.5M in 2012. In comparison, there was a 9.0% increase in payroll establishments over that period, from 715.6 thousand (K) to 780.3K. A majority (71.7%) of employees worked for establishments with payroll (data not shown; assumes one worker for each establishment without payroll). This figure is consistent with research showing almost a quarter of the construction workforce being self-employed (Harris et al., 2023).

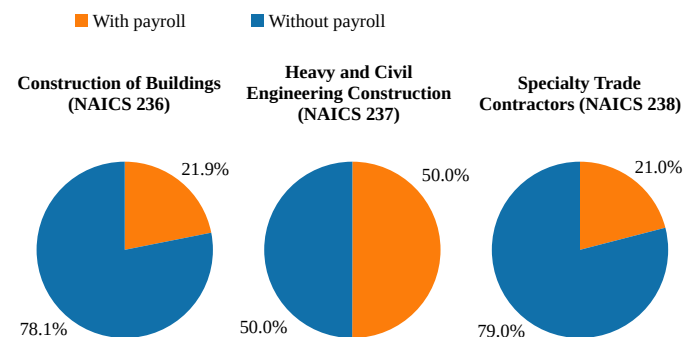
Chart 2a. Percentage of construction establishments, by payroll status (2012 versus 2021)



Source: U.S. Census Bureau, 2021 CBP-NES Combined Reports.

The proportion of establishments with and without payroll varies by *major subsector* (Chart 2b). Heavy and Civil Engineering Construction (NAICS 237) is split evenly between establishments with payroll (50.0%) and without (50.0%). In contrast, only one in five establishments in Construction of Buildings (NAICS 236; 21.9%) and Specialty Trade Contractors (NAICS 238; 21.0%) were payroll.

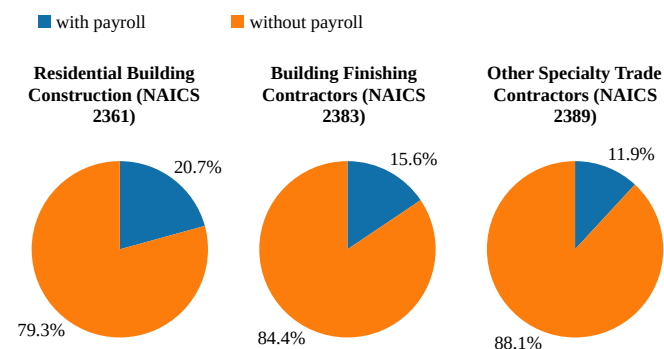
Chart 2b. Percentage of construction establishments, by major subsector and payroll status (2021)



Source: U.S. Census Bureau, 2021 CBP-NES Combined Reports.

Of the three *detailed subsectors* with the largest number of establishments, Residential Building Construction (NAICS 2361) had similar distribution by payroll status as its major subsector, Construction of Building (NAICS 236), with slightly over 20% of establishments being payroll (Chart 2c). In comparison, 15.6% of Building Finishing Contractors (NAICS 2383) and 11.9% of Other Specialty Trade Contractors (NAICS 2389) were establishments with payroll, lower than the 21.0% for all Specialty Trade Contractors (NAICS 238).

Chart 2c. Distribution of payroll status among the top* 3 detailed subsectors (2021)

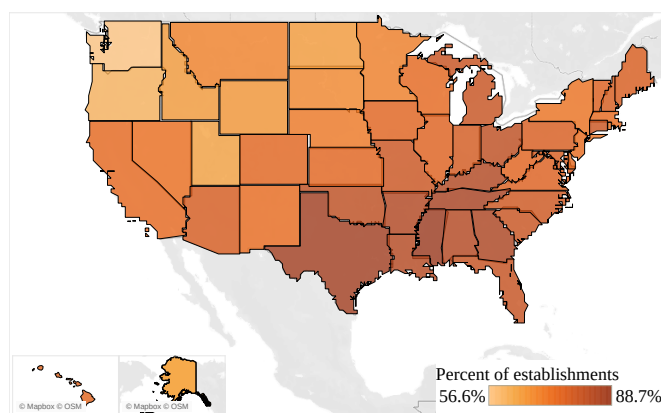


Source: U.S. Census Bureau, 2021 CBP-NES Combined Reports.

*Top defined on number of establishments.

The proportion of establishments with and without payroll also varies by state (Chart 2d). In 12 states and the District of Columbia, establishments without payroll made up more than 80% of construction establishments in 2021 (highest to lowest percentage): Mississippi, Texas, Tennessee, Georgia, Arkansas, Kentucky, Alabama, Louisiana, Oklahoma, Ohio, Florida, District of Columbia, and Michigan. There were 10 states in which payroll establishments accounted for more than 30% of establishments (highest to lowest percentage): Washington, Oregon, Alaska, Utah, Idaho, North Dakota, Wyoming, South Dakota, Montana, and Minnesota.

Chart 2d. Establishments without payroll as a percentage of all construction establishments, by state (2021)



Source: U.S. Census Bureau, 2021 CBP-NES Combined Reports.

TAKEAWAYS

These findings highlight differences in establishments with and without payroll. As the industry changes to meet demand, construction establishment trends need to be monitored because they provide indicators on how the industry is growing/performing. Information on the overall distribution of the construction workforce, which can be used to guide safety and health interventions, is crucial due to the difference in safety resources between payroll and nonemployer establishments (Schneider, n.d.).

RELATED CPWR PRODUCTS

- CPWR—The Center for Construction Research and Training. [2025]. Construction Establishments by Payroll Status. [dashboard]. www.cpwr.com/research/data-center/construction-chart-book/interactive-7th/industry-businesses/.
 - This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by year and major subsector.
- CPWR—The Center for Construction Research and Training. [2025]. Nonemployer Establishments and Revenue. [dashboard]. www.cpwr.com/research/data-center/construction-chart-book/interactive-7th/industry-businesses/.
- CPWR—The Center for Construction Research and Training. [2025]. Payroll Establishments and Employees. [dashboard]. www.cpwr.com/research/data-center/construction-chart-book/interactive-7th/industry-businesses/.

DEFINITIONS

- **Establishments (construction)** – *A single physical location occupied by a relatively permanent main or branch office. When multiple activities occur in one place under one ownership, a single establishment is counted by its major activity. The individual construction sites and projects of such dispersed activities are not considered to be establishments.*
 - **Nonemployer** – *Establishments with no paid employees, annual business receipt of \$1 or more (specific to construction industry), and are subject to federal income taxes. Independent contractors are an example of nonpayroll establishments.*
 - **Payroll** – *Establishments that have paid employees. Payroll includes all forms of compensation, including salaries, wages, commissions, dismissal pay, etc.*
- **Major subsector** – *3-digit NAICS code within construction (NAICS 23). See Chapter 1 "Pulling and Classifying Data" for details.*
 - **Detailed subsector** – *4-digit NAICS codes within construction.*

DATA SOURCES AND NOTES

U.S. Census Bureau. (2024). 2012-2021 CBP and NES Combined Reports. www.census.gov/.

- CBP-NES Combined Reports are available approximately 27 months after each reference year. For example, 2021 CBP-NES Combined Reports were not published until March 2024.

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Payroll Establishments and Employees

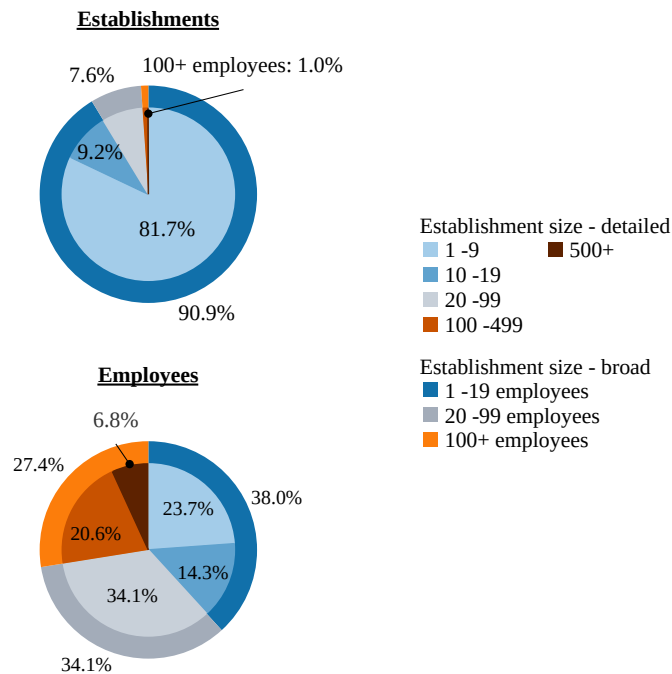
From 2012 to 2022, almost a quarter (22%) of construction *establishments* had *payroll* (see Chapter 2). A majority (82%) of construction payroll establishments employed fewer than 10 people in 2019 (Brown et al., 2021).

Data on the distribution of payroll establishments by size allows us to examine employee concentrations, assess business changes over time, and plan policies and programs, including those focused on injury and illness prevention among smaller establishments (U.S. Census Bureau, 2023). Research has found that workers employed by small establishments have an increased risk of injuries and illnesses, and these firms are less likely to implement safety and health measures (CPWR, n.d.; Dodge Construction Network, 2023).

FINDINGS

The number of establishments and employees were examined by *establishment size* (Chart 3a). From 2011 to 2022, 81.7% of construction payroll establishments had 10 or fewer employees, totaling 23.7% of the construction workforce. The largest percentage of construction workers at payroll establishments (34.1%) worked for medium-sized establishments (20 to 99 employees), which comprised 7.6% of payroll establishments. Construction establishments with 500 or more employees accounted for only 1.1% of establishments but employed 6.8% of workers.

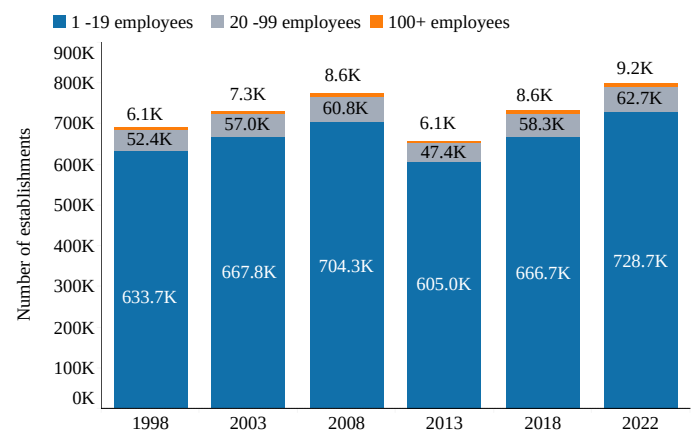
Chart 3a. Construction payroll establishments and employees, by detailed establishment size (2011-2022)



Source: U.S. Census Bureau, 2011-2022 County Business Patterns.

The number of payroll establishments in construction were then analyzed by year and size (Chart 3b). From 1998 to 2022, the number of these establishments grew 15.6% (from 692.3 thousand (K) to 800.6K). During the *Great Recession* from 2007 to 2010, there was a 15.9% decline in payroll establishments (811.5K to 682.7K; data not shown). Across all years examined, an overwhelming majority of these establishments (90.9%) employed fewer than 20 employees (Chart 3a). From 2013 to 2022, the number of payroll establishments with fewer than 20 employees increased 20.4% (605.0K to 728.7K). Meanwhile, the number of establishments with 100 or more employees grew 50.8% (6.1K to 9.2K) and establishments with 20 to 99 employees rose 32.3% (47.4K to 62.7K).

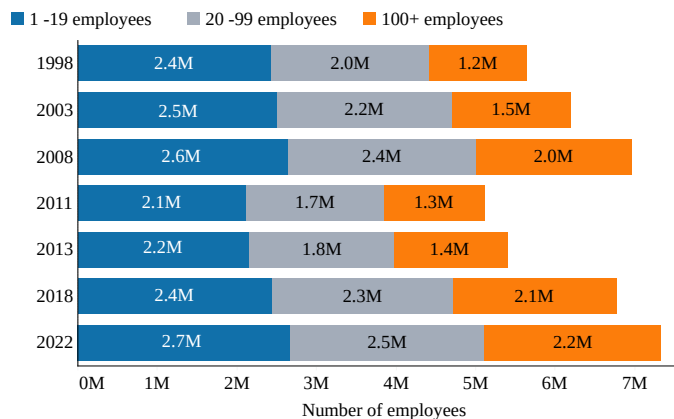
Chart 3b. Construction payroll establishments, by establishment size (1998-2022 selected years)



Source: U.S. Census Bureau, 1998-2022 County Business Patterns.

The number of employees at payroll establishments were analyzed by year and establishment size (Chart 3c). From 1998 to 2022, the total number of construction employees increased 30.4%, from 5.6 million (M) to 7.3M. The biggest increase in number of employees was among those working for establishments with more than 100 employees (+83.3%; 1.2M to 2.2M). There was also a 25% increase in the number of employees at establishments with 20 to 99 employees (2.0M to 2.5M) and a 12.5% rise at establishments with 1-19 employees (2.4M to 2.7M). In 2022, 36.3% of employees worked for construction establishments with 1 to 19 employees, compared to 39.9% in 2013. From 2013 to 2022, the percentage of workers employed by payroll establishments with more than 100 employees increased from 26.4% to 30.3%.

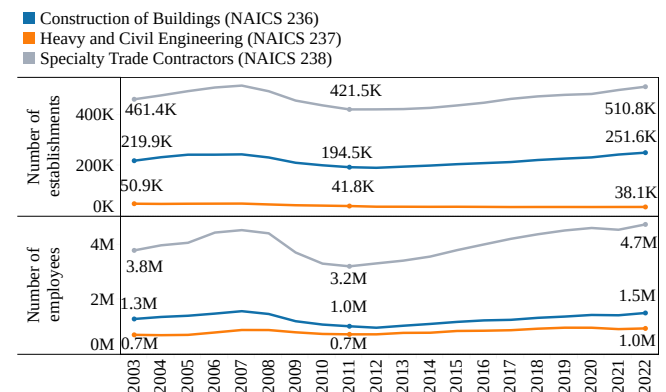
Chart 3c. Construction employees, by establishment size (1998-2022 selected years)



Source: U.S. Census Bureau, 1998-2022 County Business Patterns.

The distribution of establishments and employees was then examined by *major subsector* (Chart 3d). From 2011 to 2022, there was a 29.4% increase (from 194.5K to 251.6K) in the number of payroll establishments in Construction of Buildings (NAICS 236) and 21.2% increase (from 421.5K in 2011 to 510.8K in 2022) in the number of Specialty Trade Contractor (NAICS 238) establishments. Meanwhile, there was an 8.9% decrease (41.8K to 38.1K) in Heavy and Civil Engineering (NAICS 237) establishments. All major subsectors experienced increases in the number of employees during this period: Specialty Trade Contractors (NAICS 238; 46.9%; 3.2M to 4.7M), followed by Heavy and Civil Engineering (NAICS 237; 42.9%; 0.7M to 1.0M) and Construction of Buildings (NAICS 236; 50.0%; 1.0M to 1.5M).

Chart 3d. Number of construction payroll establishments and employees (2003-2022)



Source: U.S. Census Bureau, 2003-2022 County Business Patterns.

TAKEAWAYS

From 1998 to 2022, the number of construction payroll establishments grew 15.6% (from 692.3K to 800.6K). By 2022, 90.9% of them had fewer than 20 employees. Over this period, the number of establishments with 20-99 and over 100 employees increased faster than the number of smaller establishments.

Tracking trends over time allows us to examine employee concentrations, assess businesses changes, and plan future policies and programs that target the development and resource allocation of construction businesses. Monitoring these trends is important as the workforce and industry are expected to change (Building Radar, n.d.).

RELATED CPWR PRODUCTS

- CPWR–The Center for Construction Research and Training. [2025]. Construction Establishments by Payroll Status. [dashboard]. www.cpwr.com/research/data-center/construction-chart-book/interactive-7th/industry-businesses/.
 - This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by year and major subsector. It also includes information for detailed subsectors not discussed in this chapter.
- CPWR–The Center for Construction Research and Training. [2025]. Nonemployer Establishments and Revenue. [dashboard]. www.cpwr.com/research/data-center/construction-chart-book/interactive-7th/industry-businesses/.

DEFINITIONS

- **Establishment (in construction)** – *A single physical location occupied by a relatively permanent main or branch office in the construction industry (defined as NAICS 23). When multiple activities occur in one place under one ownership, a single establishment is counted by its major activity. The individual construction site and projects of such dispersed activities are not considered to be establishments.*
 - **Payroll** – *Establishments that have paid employees. Payroll includes all forms of compensation, including salaries, wages, commissions, dismissal pay, etc.*
- **Establishment size** – *The number of employees working for an establishment reported in the mid-March pay period.*
- **Great Recession** – *Period from 2007 to 2010 during which there was a decline in the global economy.*
- **Major subsector** – *3-digit NAICS codes within construction (NAICS 23). See Chapter 1 "Pulling and Classifying Data" for details.*

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Nonemployer Construction Establishments

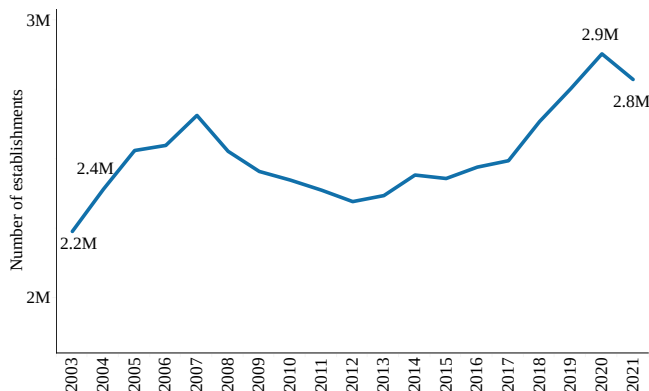
Most construction *establishments* are without payroll, sometimes referred to as "*nonemployer*." They are defined as firms with no paid employees, have business receipts of \$1 or more, and are subject to federal income taxes. Nonemployer establishments, which include independent contractors, are not represented in many business statistics (such as the U.S. Census Bureau's Economic Census) because of their size, but the Census Bureau's Nonemployment Statistics (NES) are a key source for information about these businesses.

Nonemployer establishments are more likely to be owned by minorities, women, and younger workers than employer establishments (Small Business Administration & of Advocacy, n.d.). A quarter of these establishments also plan to hire employees in the future, demonstrating how nonemployer establishments may affect the rapidly growing construction workforce (Harris et al., 2022; Moore, 2018). The changing composition of the construction industry also presents safety challenges that may increase injury risk. For example, independent contractors are often excluded from existing safety and health standards (OSHA, 2001).

FINDINGS

From 2003 to 2021, the number of nonemployer construction establishments increased 27.3%, from 2.2 million (M) to 2.8M (Chart 4a). The 8.3% increase in nonemployer construction establishments from 2010 to 2018 (2.4M to 2.6M) was lower than the 20% increase reported for this type of firm in all industries during this period (McDermott & Conroy, n.d.). From 2019 to 2020, there was a 3.6% increase in nonemployer construction establishments, from 2.8M to 2.9M and nonemployer establishments decreased 3.4% from 2020 to 2021 (2.9M to 2.8M). Findings from 2020 and 2021 may have been impacted by the COVID-19 pandemic or by data collection challenges during that period (U.S. Census Bureau, n.d.-a.).

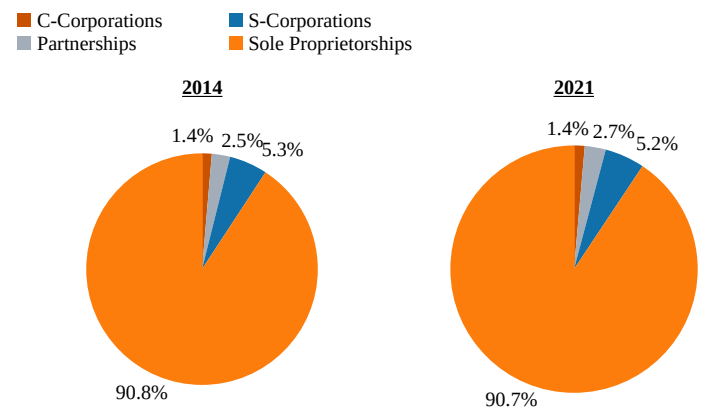
Chart 4a. Number of nonemployer establishments (2003-2021)



Source: U.S. Census Bureau, 2003-2021 Nonemployer Statistics.

Nonemployer establishments by *legal form of organization* were examined for 2014 and 2021 (Chart 4b). In 2021, an overwhelming majority (90.7%) of nonemployer establishments were sole proprietorships or self-employed. The remaining were S-corporations (5.2%), partnerships (2.7%), and C-corporations (1.4%). This distribution of organizational form for nonemployer establishments changed only minimally since 2014.

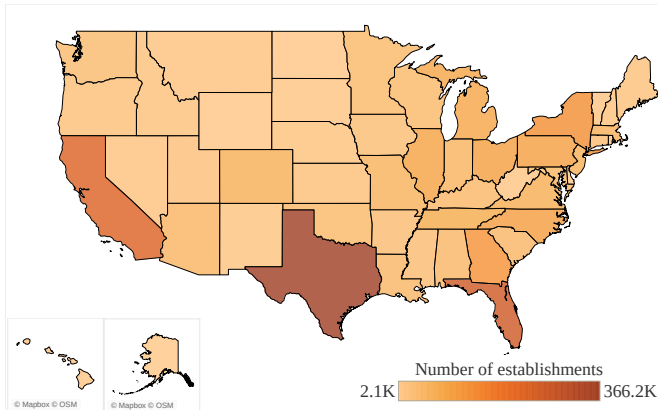
Chart 4b. Nonemployer establishments, by legal form of organization (2014 versus 2021)



Source: U.S. Census Bureau, 2003-2021 Nonemployer Statistics.

By state, Texas had the largest number of nonemployer establishments with 366.2 thousand (K) in 2021, followed by Florida (261.6K), California (234.2K), New York (127.9K), and Georgia (122.5K; Chart 4c). This largely aligns with state populations (U.S. Census Bureau, n.d.-a) and the states with the highest number of fatal injuries (CPWR, 2025).

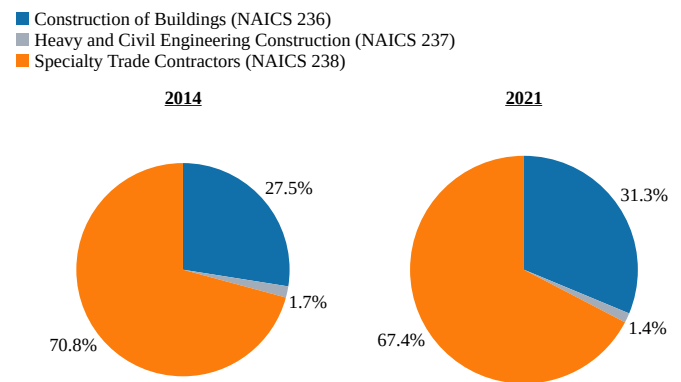
Chart 4c. Nonemployer establishments, by state (2021)



Source: U.S. Census Bureau, 2021 Nonemployer Statistics.

Next, the proportion of nonemployer establishments was evaluated by *major subsector* (Chart 4d). In 2021, two-thirds (67.4%) of nonemployer establishments were Specialty Trade Contractors (NAICS 238), followed by 31.3%. From 2014 to 2021, the percentage of Construction of Buildings (NAICS 236) nonemployer establishments increased from 27.5% to 31.3% among Construction of Buildings (NAICS 236). Meanwhile, the percentage of nonemployer establishments decreased among Specialty Trade Contractors (NAICS 238; 70.8% to 67.4%) and Heavy and Civil Engineering Construction (NAICS 237; 1.7% to 1.4%).

Chart 4d. Nonemployer establishments, by major subsector (2014 versus 2021)



Source: U.S. Census Bureau, 2014 and 2021 Nonemployer Statistics.

TAKEAWAYS

The composition of construction establishments plays a role in worker safety, which comprise a majority of construction firms, increased from 2003 to 2021. In 2021, a majority of nonemployer establishments were sole proprietorships (90.7%) and Specialty Trade Contractors (NAICS 238; 67.4%). The construction industry composition plays a role in safety which may explain the finding that the four states with the most nonemployer establishments also had the highest numbers of fatal injuries (CPWR, 2025; Schneider, n.d.).

These findings suggest a need to examine employment at both payroll and nonemployer establishments to guide future safety and health policies and programs. This is especially important for independent contractors classified as nonemployer establishments, as these workers are not typically covered under OSHA protections and often have limited awareness and access to safety and health resources (Schneider, n.d.).

RELATED CPWR PRODUCTS

- CPWR—The Center for Construction Research and Training. [2025]. Construction Establishments by Payroll Status. [dashboard]. www.cpwr.com/research/data-center/construction-chart-book/interactive-7th/industry-businesses/.
- CPWR—The Center for Construction Research and Training. [2025]. Nonemployer Establishments and Revenue. [dashboard]. www.cpwr.com/research/data-center/construction-chart-book/interactive-7th/industry-businesses/.
 - This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by year and major subsector.

DEFINITIONS

- **Establishments (construction)** – *A single physical location occupied by a relatively permanent main or branch office. When multiple activities occur in one place under one ownership, a single establishment is counted by its major activity. The individual construction sites and projects of such dispersed activities are not considered to be establishments.*
 - **Nonemployer** – *Establishments with no paid employees, annual business receipt of \$1 or more (specific to construction industry), and are subject to federal income taxes. Independent contractors are an example of nonpayroll establishments.*
- **Legal form of organization** – *The legal business structure, including Sole Proprietorships, Partnerships, C-Corporations, and S-Corporations. Full definitions can be found at: www.census.gov/programs-surveys/nonemployer-statistics/about/glossary.html.*
- **Major subsector** – *3-digit NAICS code within construction (NAICS 23). See Chapter 1 "Pulling and Classifying Data" for details.*

DATA SOURCES AND NOTES

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www.census.gov/programs-surveys/nonemployer-statistics/data/datasets.html.

- NES data are available approximately 17 months after each reference year.
- Due to the COVID-19 pandemic, tax returns were filed later than normal, which affected when NES data were released and may have resulted in potential undercoverage/underreporting for 2019 and 2020 (U.S. Census Bureau, n.d.-b).

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Construction Value Added

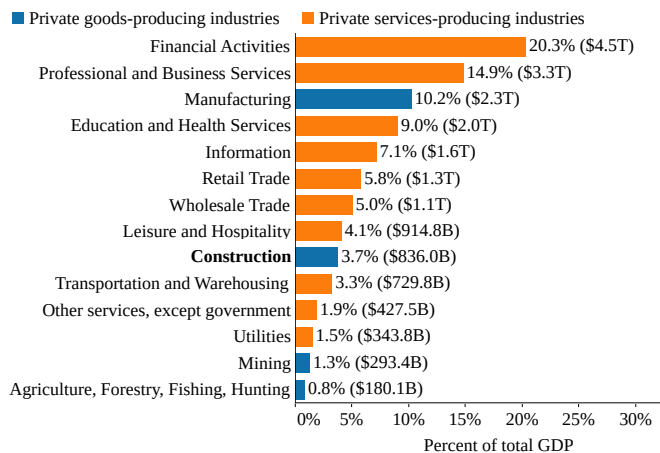
The U.S. *gross domestic product (GDP)*—the value of goods and services the country produces—is a comprehensive measure used to monitor economic health and activity (GDP; U.S. Bureau of Economic Analysis (BEA), 2023). GDP also tracks whether industries or subsectors are growing or slowing, which can help guide federal and state spending and tax policies, as well as provide businesses with information when making economic decisions (e.g., hiring, expanding, investing).

Construction value added shows the industry's contribution to the overall GDP (U.S. BEA, 2006). The industry's quarterly and annual value added can offer insights into the overall U.S. economic landscape, as well as help with economic predictions (Johnson & Forbes Business Council, 2023); Historically, a slowdown of construction investments indicates an economic downshift has begun (Johnson & Forbes Business Council, 2023).

FINDINGS

In 2023, the U.S. inflation-adjusted GDP totaled \$22.4 trillion *chained dollars* (Chart 5a). Financial activities, a *private services-producing industry*, made the largest contribution to the overall GDP, totaling \$4.5 trillion (20.3%). Construction accounted for 3.7% of the overall GDP, or \$836.0 billion (B). It had the ninth largest private industry contribution to GDP and the second largest contribution of *private goods-producing industries*.

Chart 5a. Real value added, by industry*^ (2023; 2017 chain dollars)



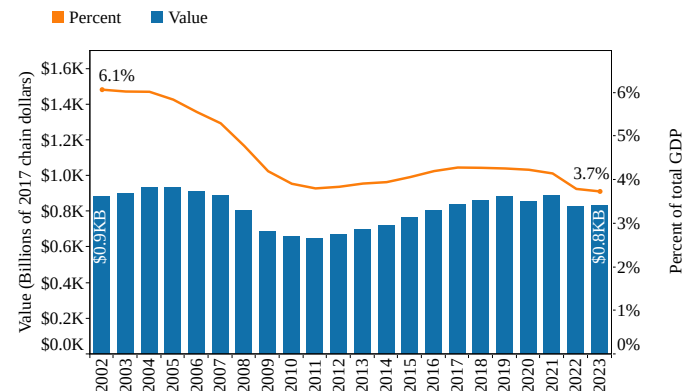
Source: U.S. Bureau of Economic Analysis, 2023 Real Value Added by Industry.

*Excludes public industries (federal, state, and local government).

^See industry definitions at: www.bls.gov/sae/additional-resources/naics-supersectors-for-ces-program.htm.

From 2002 to 2022, 3.7% to 6.1% of the total U.S. GDP annually came from the construction industry (\$648.9B to \$934.0B) based on *real value added*, with an average contribution of 4.6% (Chart 5b). From 2002 to 2007, construction averaged 5.9% of the total U.S. GDP. However, during the *Great Recession* from 2007 to 2010, construction contributed 4.5% of the total U.S. GDP on average. From 2008 to 2023, construction's real value on average was 4.0% of total U.S. GDP. The lowest year was 2023, when construction accounted for 3.7% of the total U.S. GDP, totaling \$836.0B.

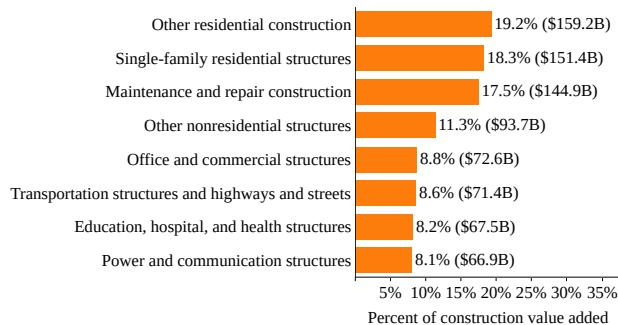
Chart 5b. Real value added by construction and as a percentage of GDP in the U.S. (2002-2023; 2017 chain dollars)



Source: U.S. Bureau of Economic Analysis, 2002-2023 Real Value Added by Industry.

Looking at *detailed construction subsectors* using *BEA industry codes*, Other residential construction accounted for 19.2% of construction's real value added in 2022 (Chart 5c). Followed by single-family residential structures (18.3%) and maintenance and repair construction (17.5%). These figures align with overall construction employment, in which the largest number of construction workers were in these three detailed subsectors: Building Equipment Contractors (NAICS 2382; 31% of construction workers), Foundation, Structure, and Building Exterior Contractors (NAICS 2381; 12%), and Residential Building Construction (NAICS 2361; 12%; BLS, 2024).

Chart 5c. Real value added by detailed construction industries* 2022 (2017 chain dollars)

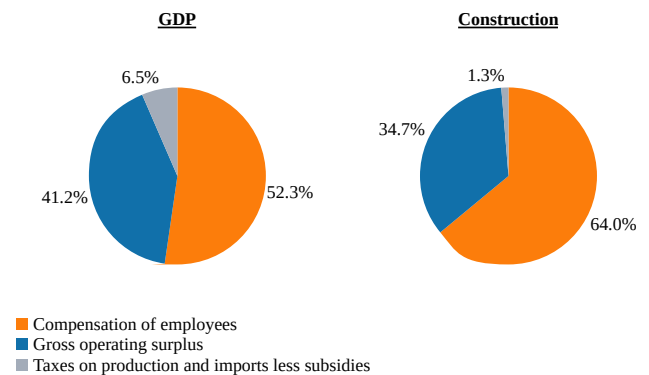


Source: U.S. Bureau of Economic Analysis, 2022 U. Real Value Added by Industry.

*Industry defined used BEA Industry and Commodity Codes, all under NAICS 23 (Construction).

Next, the components of value added (not-inflation adjusted) were examined to understand how the construction industry compares to the overall GDP. A majority (64.0%) of construction value added was on *compensation of employees*, compared to 52.3% for total GDP (Chart 5d). The next largest component of value added was *gross operating surplus*, which accounted for over a third of construction value added, compared to 41.2% for total GDP.

Chart 5d. Components of Value Added as a Percentage of Value Added, Total GDP versus Construction 2022



Source: U.S. Bureau of Economic Analysis, 2022 U. Real Value Added by Industry.

TAKEAWAYS

Among private goods-producing industries, construction accounted for the second highest contribution to total U.S. GDP in 2023. The real value added by construction fluctuated, but its contribution to total GDP trended downward over the past two decades. This is consistent with Bureau of Labor Statistics (BLS) findings that there has been a shift in employment from goods-producing industries to service-providing industries during that period (BLS, 2024).

Continued monitoring of value added in construction remains important as an economic indicator, and that information can help guide spending and tax policies, as well as help businesses make economic decisions.

DEFINITIONS

- **BEA Industry Commodity Codes** – Industry classification defined by the Bureau of Economic Analysis. Detailed construction codes are not mapped to 3 to 5-digit NAICS codes, but all codes are mapped under NAICS 23. See: www.bea.gov/system/files/2023-10/BEA-Industry-and-Commodity-Codes-and-NAICS-Concordance.xlsx. Specific industry codes can be requested by contacting datacenter@cpwr.com.
- **Chained dollars** – Inflation-adjusted real dollar amounts that allow comparisons over time. See: www.bea.gov/help/glossary/chained-dollar-estimates.
- **Compensation of employees** – Sum of wage and salary accruals and wage and salary supplements.
- **Construction value added** – Construction breakdown of gross domestic product or value added.
- **Detailed subsector** – 4-digit NAICS codes within construction. See Chapter 1 "Pulling and Classifying Data" for details.

- **Great Recession** – Period from 2007 to 2010 with a decline in the global economy.
- **Gross domestic product (GDP)** – Also known as value added, includes the value of goods and services produced minus the value of goods and services used in production.
- **Gross operating surplus** – The total industry output minus intermediate outputs, compensation of employees, and taxes on production and imports.
- **Real value added** – GDP estimate that excludes the effects of price changes, otherwise known as inflation-adjusted.
- **Private goods-producing industry** – Includes agriculture, forestry, fishing, and hunting; mining; construction; and manufacturing.
- **Private services-producing industry** – Includes utilities; wholesale trade; retail trade; transportation and warehousing; information; finance, insurance, real estate, rental, and leasing; professional and business services; educational services, health care, and social assistance; arts, entertainment, recreation, accommodation, and food services; and other services, except government.

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Construction Spending

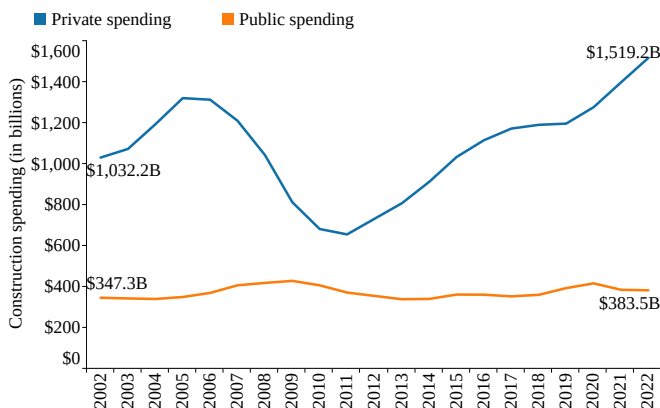
Construction, and by extension *construction spending* (also known as value of construction put in place), are woven into the U.S. economic environment. Construction itself provides job opportunities, while construction spending reflects investments in infrastructure, new business, housing, and other indicators of economic growth.

Past examinations of the impact of construction expenditure on job growth have shown an association between the two (Ball 1981). As a result, examining construction spending affords us the opportunity to better understand and contextualize trends in both construction activities and employment throughout the United States. All amounts shown in charts in this chapter are in 2022 dollars.

FINDINGS

From 2002 to 2022, private construction spending has regularly exceeded public construction spending—on average, it has been 2.9 times higher. Private spending reached \$1.5 trillion (T) in 2022 (Chart 6a), a 26.8% increase since 2019 (\$1.2T). During that period, public construction spending fell 2.7% (\$394.2 billion (B) to \$383.5B).

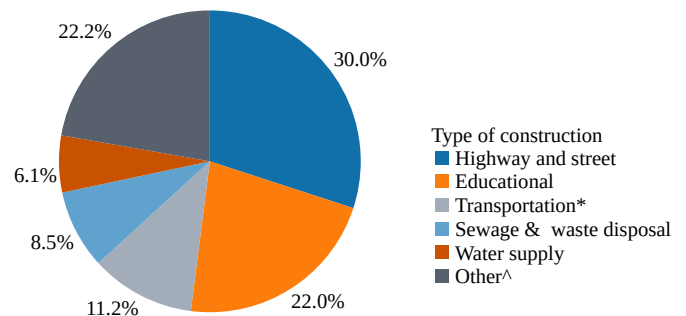
Chart 6a. Total construction spending, private vs. public (2002-2022)



Source: U.S. Census Bureau, 2002-2022 Construction Spending Survey.

Spending was then examined for public construction by *type of construction* (Chart 6b). Highway and street construction accounted for 30.0% (\$114.8B) of public construction spending, followed by educational construction at 22.0% (\$84.0B) and transportation (11.2%; \$42.9B).

Chart 6b. Public construction spending, by type of construction (2022)



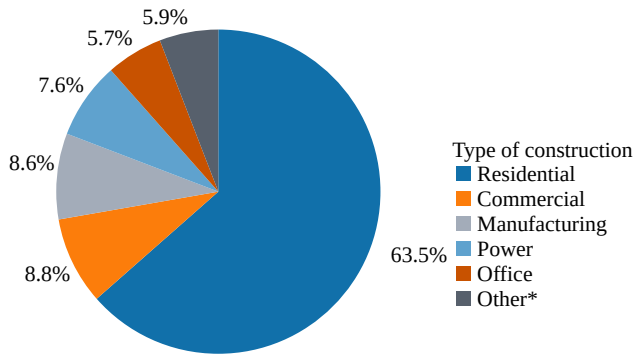
Source: U.S. Census Bureau, 2022 Construction Spending Survey.

*Transportation includes maintenance of air, land, and water facilities. Excludes highway and street maintenance.

^Includes types of construction that individually accounted for 5% or less of average annual public construction spending from 2002-2022.

In 2022, 63.5% (\$922.8B) of all private construction spending was on residential construction. Commercial construction accounted for 8.8% of private spending (\$127.2B) followed by manufacturing (8.6%; \$124.5B) and power (7.6%; \$111.1B; Chart 6c).

Chart 6c. Private construction spending, by type of construction (2022)

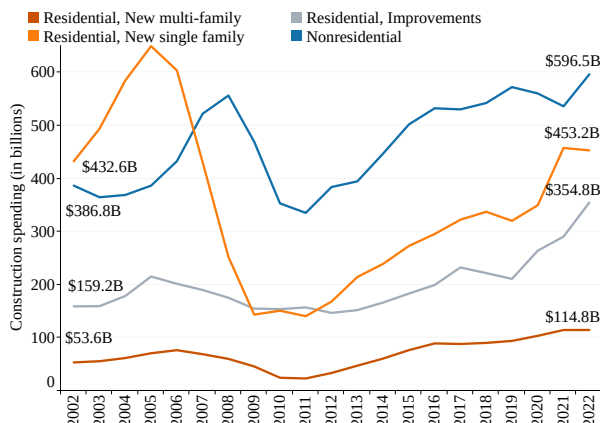


Source: U.S. Census Bureau, 2022 Construction Spending Survey.

*Includes types of construction that individually accounted for 5% or less of average annual private construction spending from 2002-2022.

Within private construction, residential spending from 2002 to 2022 was on average 32.3% higher than nonresidential spending (Chart 6d). Residential spending saw precipitous decreases leading into and persisting through the *Great Recession*; there were also decreases in nonresidential spending during the period. Between 2019 and 2022, residential spending increased 49.8% (\$625.6B to \$922.8B; combined data not shown for residential), while nonresidential increased by 11.2% (\$536.3B to \$596.5B). Notably, the 2022 high in private spending shown in Chart 6a was driven by increases in both private residential spending (\$922.8 B) and nonresidential spending (\$596.5B). New single-family housing was the predominant contributor to private residential spending, accounting for \$332.6B (56.3%) each year on average.

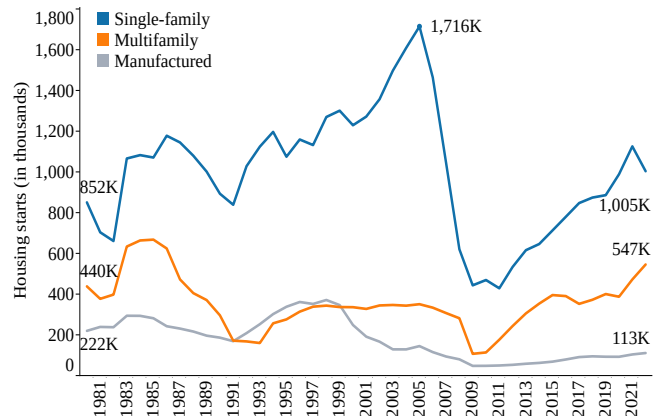
Chart 6d. Private construction spending, by type (2002-2022)



Source: U.S. Census Bureau, 2002-2022 Construction Spending Survey.

New housing starts from 1980 to 2022 were also examined (Chart 6e). Single-family housing consistently dominated the field, with 1.7 million (M) starts at the 2005 peak, and dropping significantly during the Great Recession to 431 thousand (K) at its lowest in 2011. Starts of multi-family homes followed similar trends. Though multi-family starts did not rise significantly leading to 2005, they experienced a 401.8% increase from their lowest point in 2009 to their period high in 2022, compared to a 125.8% increase among single-family homes across this period.

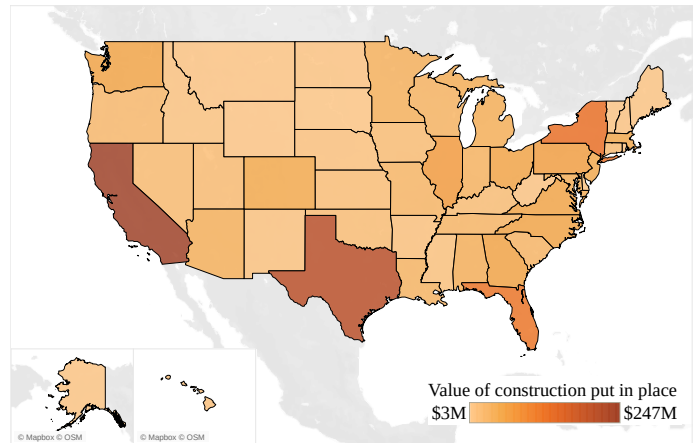
Chart 6e. New housing starts, by type (1980-2022)



Source: Joint Center for Housing Studies at Harvard University, 2023 State of the Nation's Housing Report.

The value of construction put in place in 2017 (last data available), separated by state, shows similar trends as other industry statistics such as employment and injuries (Chart 6f). Spending was highest in California (\$247.2M), Texas (\$209.8M), New York (\$129.0M), and Florida (\$120.5M).

Chart 6f. Value of construction put in place, by state (2017)



Source: U.S. Census Bureau, 2017 Economic Census.

Construction spending over the past 20 years has been primarily driven by private construction, with spending on public construction projects remaining generally steady. Private construction was more vulnerable to severe economic downturns, as seen during the Great Recession, when residential construction—which comprises a majority of private spending—dropped precipitously. Among private residential construction types, single-family homes continue to make up a majority of construction spending, although the amount devoted to multi-family housing has risen dramatically in recent years. Geographically, construction spending aligns with high population states, including California, Florida, New York, and Texas.

RELATED CPWR PRODUCTS

- CPWR—The Center for Construction Research and Training. [2025]. Construction Spending. [dashboard]. www.cpwr.com/research/data-center/construction-chart-book/interactive-7th/industry-businesses/.
 - This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by year, as well as a chart level filters for sector for spending type.

DEFINITIONS

- **Construction spending/Value of Construction Put in Place** – A measure of the value of construction installed or erected at the site during a given period. For an individual project, this includes:
 - Cost of materials installed or erected.
 - Cost of labor and a proportionate share of the cost of construction equipment rental.
 - Contractor's profit.
 - Cost of architectural and engineering work.
 - Miscellaneous overhead and office costs chargeable to the project on the owner's books.
 - Interest and taxes paid during construction (except for state and locally owned projects).
- **Great Recession** – Period from 2007 to 2010 with a decline in the global economy.
- **Improvements** – Includes remodeling, additions, and major replacements to owner-occupied residential properties subsequent to the completion of the original building.
- **Type of construction** – The classification of construction according to the U.S. Census scheme. For more information on classification of construction, see the U.S. Census construction spending definitions page: www.census.gov/construction/c30/definitions.html.

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Business Owner Demographics

Information on the demographics of construction business owners can build understanding of business needs, guide outreach to owners to improve their safety efforts, and assess industry growth (U.S. Census Bureau, 2024a). Monitoring these demographics is becoming especially important because the composition of the U.S. population is rapidly changing, which may impact ownership and industry patterns. For example, predictions suggest that by 2045, non-Hispanic white Americans will no longer make up a majority of the population, highlighting the growth of Hispanic and other minority populations (Vespa et al., 2020).

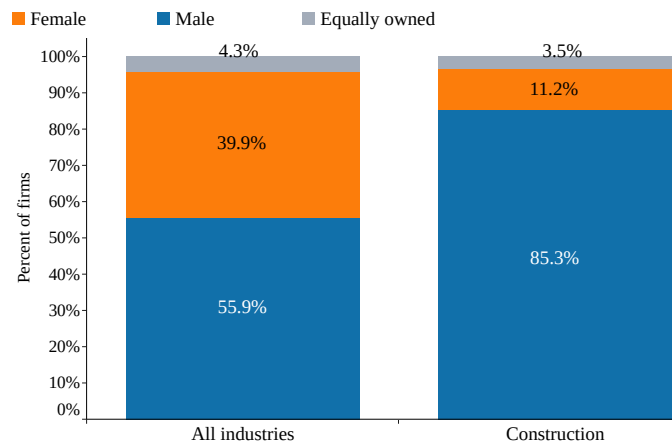
Although construction has one of the largest percentages of *minority-owned* firms of any industry, the U.S. Equal Employment Opportunity Commission reports that a majority of business owners in construction are white males (U.S. Equal Employment Opportunity Commission, 2023). Disparities in ownership may limit the industry's ability to hire a diverse workforce, which is increasingly important with the growing demand for workers, as minority-owned businesses are more likely to hire minorities (Bates et al., 2022).

Until 2012, owner demographic information was obtained using the Survey of Business Owners (SBO), but this survey stopped after that year (U.S. Census Bureau, 2023). Since 2017, data on business owners come from the Annual Business Survey (ABS) and Nonemployer Statistics by Demographics (NES-D), which collect demographic information for *employer* and *nonemployer firms* (U.S. Census Bureau, 2024b). Due to these changes in data sources, data presented in this chapter are not comparable to prior Construction Chart Book estimates.

FINDINGS

In 2021, there were 3.5 million construction firms in the U.S., accounting for 10.3% of all firms (data not shown). In 2021, a majority of construction firms were owned by males (85.3%), 1.5 times higher than male-ownership for all industries (55.9%) (Chart 7a). A little more than one in ten firms were owned by women (11.2%), 3.6 times lower than female-ownership for all industries (39.9%).

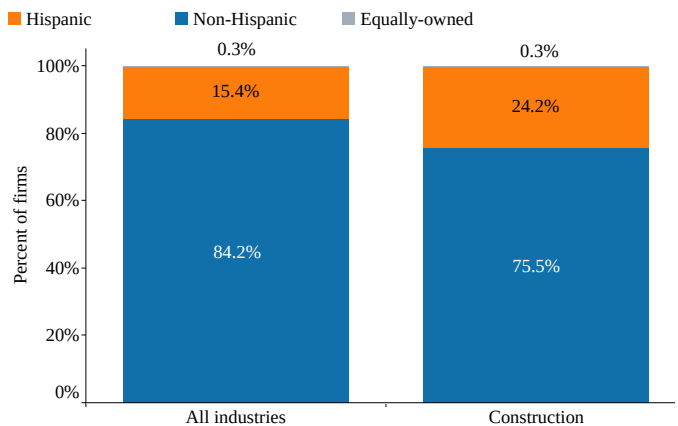
Chart 7a. Firm ownership, by sex and industry (2021)



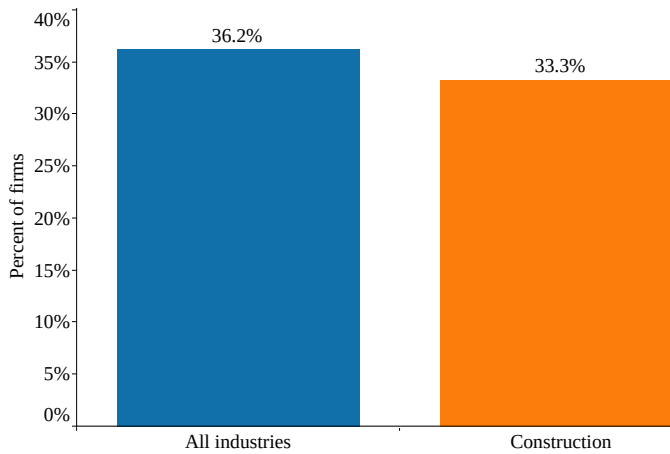
Source: U.S. Census Bureau, 2021 Nonemployer Statistics by Demographics Table AB2100NESD01.

By *ethnicity*, almost one out of four construction firms (24.2%) in 2021 were Hispanic-owned, compared to 15.4% of firms in all industries (Chart 7b). Minority firms (non-Hispanic and non-White owner) accounted for a third (33.3%) of construction firms, slightly less than minority ownership for all industries during that year (36.2%; Chart 7c). These findings align with a study from the Brookings Institution, which reported a majority of business owners are white and non-Hispanic (Edelberg & Steinmetz-Silber, 2024). It was also reported that the number of minority owners rose from 2019 to 2022, while the number of white owners barely changed.

Chart 7b. Firm ownership, by ethnicity and industry (2021)

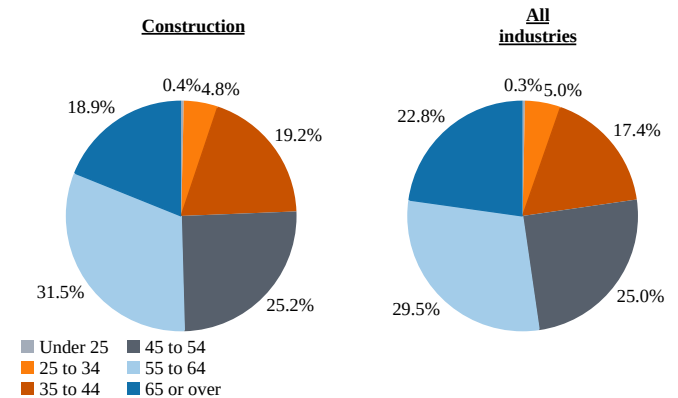


Source: U.S. Census Bureau, 2021 Nonemployer Statistics by Demographics Table AB2100NESD01.

Chart 7c. Minority-owned firms by industry (2021)

Source: U.S. Census Bureau, 2021 Nonemployer Statistics by Demographics Table AB2100NESD01.

In 2021, the age distribution of owners was similar for firms in construction and in all industries (Chart 7d). Half (50.4%) of construction employer firm owners were over 55 years old, 31.5% aged 55 to 64 years old and 18.9% older than 65 years old. A slightly higher percentage (52.3%) of owners for all industries were over 55 years old. There was also a slightly higher percentage of construction business owners under 45 years old than in all industries (24.4% versus 22.7%, respectively).

Chart 7d. Age distribution among employer firm owners, by industry (2021)

Source: U.S. Census Bureau, 2021 Annual Business Survey Table AB2100CSCBO.

TAKEAWAYS

Owner demographic trends highlight potential disparities which may impact the recruitment and retention of workers. These are both areas that need to be continually monitored given the growing demand for construction workers (Associated Builders and Contractors, 2024).

In addition, construction owners are predominantly non-Minority, with a majority being male (85.3%) and non-Hispanic (75.5%). This may be due to the result of barriers minority-owned firms face, including bid requirements, explicit discrimination, and stigma (Premier Quantitative Consulting, 2016). There have been several recent efforts to expand small and disadvantaged businesses highlighting a need to continually monitor the demographics of owners in construction (U.S. Department of the Treasury, 2023).

In 2021, half of owners were over 55 years old. This may result from individuals accumulating resources as they age that can help a business succeed, such as financial and social capital (Azoulay et al., 2018; Kautonen, 2013).

RELATED CPWR PRODUCTS

- CPWR–The Center for Construction Research and Training. [2025]. Business Owner Demographics. [dashboard]. www.cpwr.com/research/data-center/construction-chart-book/interactive-7th/industry-businesses/.
 - This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by year and employer type, as well as chart level filters for demographics.

DEFINITIONS

- Employer firms** – Include all firms that reported a payroll during the reference year.
- Equally owned** – Firms in which ownership is equally split (50/50) for the demographic.
- Ethnicity** – Whether a person is of Hispanic, Latino, or Spanish origin.

- **Minority-owned** – More than 51 percent of the stock or equity of the firms is owned by those who are any race and ethnicity combination other than non-Hispanic and White. These firms are also commonly called Minority Business Enterprises (MBEs).
- **Nonemployer firms** – Includes firms with no paid employees, no annual business receipts of \$1 or more (specific to construction), and subject to federal income taxes.

DATA SOURCES AND NOTES

U.S. Census Bureau. (2024). Annual Business Survey. Table AB2100CSCBO. data.census.gov/.

U.S. Census Bureau. (2024). Nonemployer Statistics by Demographics. Table AB2100NESD01. data.census.gov/.

REFERENCES

- Associated Builders and Contractors. (2024, January 31). ABC: 2024 Construction Workforce Shortage Tops Half a Million. News Releases. www.abc.org/News-Media/News-Releases/abc-2024-construction-workforce-shortage-tops-half-a-million.
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- U.S. Census Bureau. (2024b, July 30). Nonemployer Statistics by Demographics Methodology. www.census.gov/programs-surveys/abs/technical-documentation/NESDmethodology.html.
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- U.S. Equal Employment Opportunity Commission. (2023). Building for the Future: Advancing Equal Employment Opportunity In the Construction Industry. www.eeoc.gov/building-future-advancing-equal-employment-opportunity-construction-industry.
- Vespa, J., Medina, L., & Armstrong, D. M. (2020). Demographic Turning Points for the United States: Population Projections for 2020 to 2060. www.census.gov/content/dam/Census/library/publications/2020/demo/p25-1144.pdf.

Characteristics of Construction Employer Firms

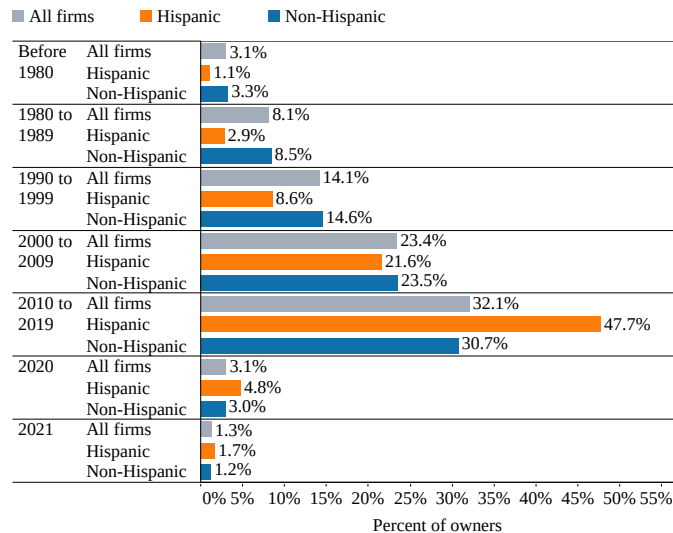
In 2021, one in five construction establishments was *employer* (e.g., payroll; CPWR, 2025). Construction employer firms are diverse in ownership, who they hire, and the customers they serve. Monitoring construction employer firm characteristics provides information on how the industry is growing and changing, as well as on employment trends (e.g., full-time, part-time, paid day laborers, contractors, etc.).

The U.S. Census Bureau previously collected information on employer businesses through the Survey of Business Owners (SBOs), until the survey ended in 2012 (U.S. Census Bureau, 2023). Since 2017, data has been collected through the Annual Business Survey (ABS; U.S. Census Bureau, 2024). The ABS now provides the kind of information that can be used to monitor changes in construction businesses.

FINDINGS

A majority (80.8%) of construction employer firms were *acquired* before 2020 (Chart 8a). Overall, a quarter (25.3%) of firms were acquired before 2000. Most recently 4.4% of all construction employer firms were acquired from 2020 to 2021. By ethnicity, a slightly higher percentage of Hispanic-owned firms were acquired than non-Hispanic (6.5% versus 4.2%) from 2020 to 2021. The Small Business Administration reports that across all industries Hispanic-owned firms increased 14% from 2021 to 2022, accounting for 14.5% of all owners (Small Business Administration Office of Advocacy, 2024).

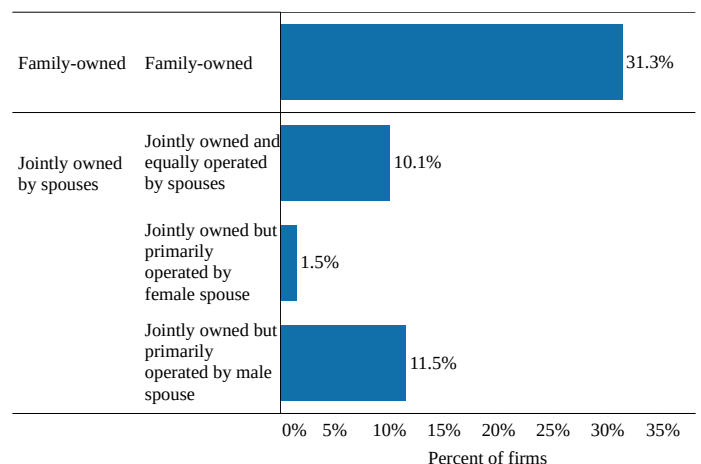
Chart 8a. Year construction business acquired, by ethnicity (2021)



Source: U.S. Census Bureau, 2021 Annual Business Survey: Business Characteristics of Respondent Employer Firms.

Just over one-third of firms in 2021 (31.3%) were *family-owned* (Chart 8b). When examining *spouse-ownership*, 11.5% were primarily operated by a male and 10.1% were equally operated by spouses. In comparison, 1.5% were jointly owned but primarily operated by a female spouse.

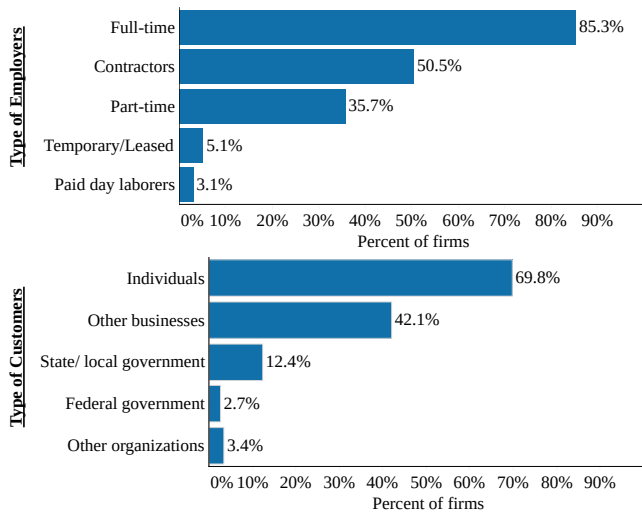
Chart 8b. Family and spouse-ownership, by ethnicity (2021)



Source: U.S. Census Bureau, 2017 Annual Business Survey: Business Characteristics of Respondent Employer Firms.

Next, the *type of workers* employed by and the customers of employer firms were examined. In 2021, a majority of employer firms employed *full-time workers*, while over half used *contractors* (50.5%; Chart 8c). Overall, 3.4% of employer firms reported using *paid day laborers*. Almost three times as many Hispanic-owned firms reported using paid day laborers than non-Hispanic owned firms (7.2% versus 2.8%, respectively; data not shown). When asked about their customers, 69.8% of all employer firms reported individuals, 42.1% reported other businesses, and 15.1% reported government.

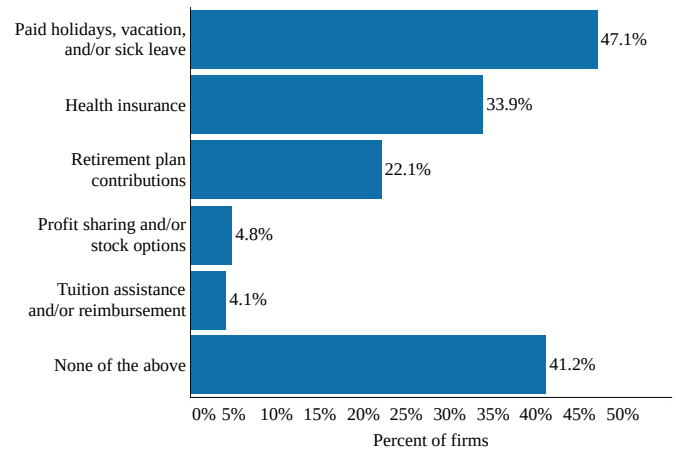
Chart 8c. Type of workers and customers (2021)



Source: U.S. Census Bureau, 2021 Annual Business Survey: Business Characteristics of Respondent Employer Firms.

Data from 2017 (last year collected) indicates that 41.2% of employer firms did not provide any of the following benefits: paid leave (holiday, vacation, sick), health insurance, retirement plan contributions, profit sharing and/or stock options, or tuition assistance (Chart 8d). Additional information on health insurance coverage can be found in Chapter 26.

Chart 8d. Benefits offered by employer firms (2017)



Source: U.S. Census Bureau, 2021 Annual Business Survey: Business Characteristics of Respondent Employer Firms.

TAKEAWAYS

A quarter of construction employer firms were acquired before 2000. In addition, almost a third are family-owned compared to 27% of all firms (Williams, 2024). Tracking owner characteristics provides information on employer firms that allows us to better understand the industry composition.

In addition, monitoring types of workers employed in employer firms is also essential, as paid day laborers are often harder to reach through traditional safety and health efforts due to their moving frequently between job sites. Understanding the characteristics of employer firms that employ these workers can help guide future prevention and intervention efforts.

RELATED CPWR PRODUCTS

- CPWR–The Center for Construction Research and Training. [2025]. Characteristics of Employer Firms. [dashboard]. www.cpwr.com/research/data-center/construction-chart-book/interactive-7th/industry-businesses/.
 - This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by year.

DEFINITIONS

- **Acquired** – Includes, but is not limited to, creating the business, buying the business, and inheriting the business.
- **Employer firms** – Include all firms that reported a payroll during the reference year with receipts of \$1,000 or more.
- **Family-owned** – Include firms in which two or more members of the family own the majority of the business, including spouses/unmarried partners, parents/guardians, children, siblings, or close relatives.
- **Spouse-owned** – Include firms in which spouses/unmarried partners jointly owned the business.
- **Type of workers** – Describes the type of workers used by businesses.
 - **Contractors** – Contractors, subcontractors, independent contractors, or outside consultants.
 - **Full-time paid employees** – Those who received a W-2 from the business and work 35 hours or more per week.
 - **Paid day laborer** – Those who are hired to perform work on a daily or project-by-project basis.
 - **Part-time employees** – Those who received a W-2 from the business and work less than 35 hours per week.
 - **Temporary/leased** – Includes workers obtained from a temporary help service and those leased from a leasing service or a professional employer organization.

DATA SOURCES AND NOTES

U.S. Census Bureau. (2024). Annual Business Survey: Business Characteristics of Respondent Employer Firms by Industry, Sex, Ethnicity, Race, and Veteran Status for the U.S., States, and Metro Areas. data.census.gov/.

- The Annual Business Survey uses the collection year when referenced by the U.S. Census Bureau. For example, 2022 Annual Business Survey data covers 2021 data. Years shown on this page are for the reference year, not data collection year.

U.S. Census Bureau. (2024). Annual Business Survey: Owner Characteristics of Respondent Employer Firms by Sector, Sex, Ethnicity, Race, and Veteran Status for the U.S., States, and Metro Areas. data.census.gov/.

- The Annual Business Survey uses the collection year when referenced by the U.S. Census Bureau. For example, 2022 Annual Business Survey data covers 2021 data. Years shown on this page are for the reference year, not data collection year.

REFERENCES

CPWR–The Center for Construction Research and Training. (2025). Construction Establishments by Payroll Status. [dashboard]. www.cpwrr.com/research/data-center/construction-chart-book/interactive-7th/industry-businesses/.

U.S. Census Bureau. (2023, October 19). Survey of Business Owners and Self-Employed Persons (SBO). www.census.gov/programs-surveys/sbo.html.

U.S. Census Bureau. (2024, June 5). About the Annual Business Survey (ABS). www.census.gov/programs-surveys/abs/about.html.

U.S. Small Business Administration Office of Advocacy. (2024, September 17). Small Business Facts: Hispanic Ownership Statistics 2024. Infographics. advocacy.sba.gov/2024/09/17/small-business-facts-hispanic-ownership-statistics-2024/.

Labor Force Characteristics

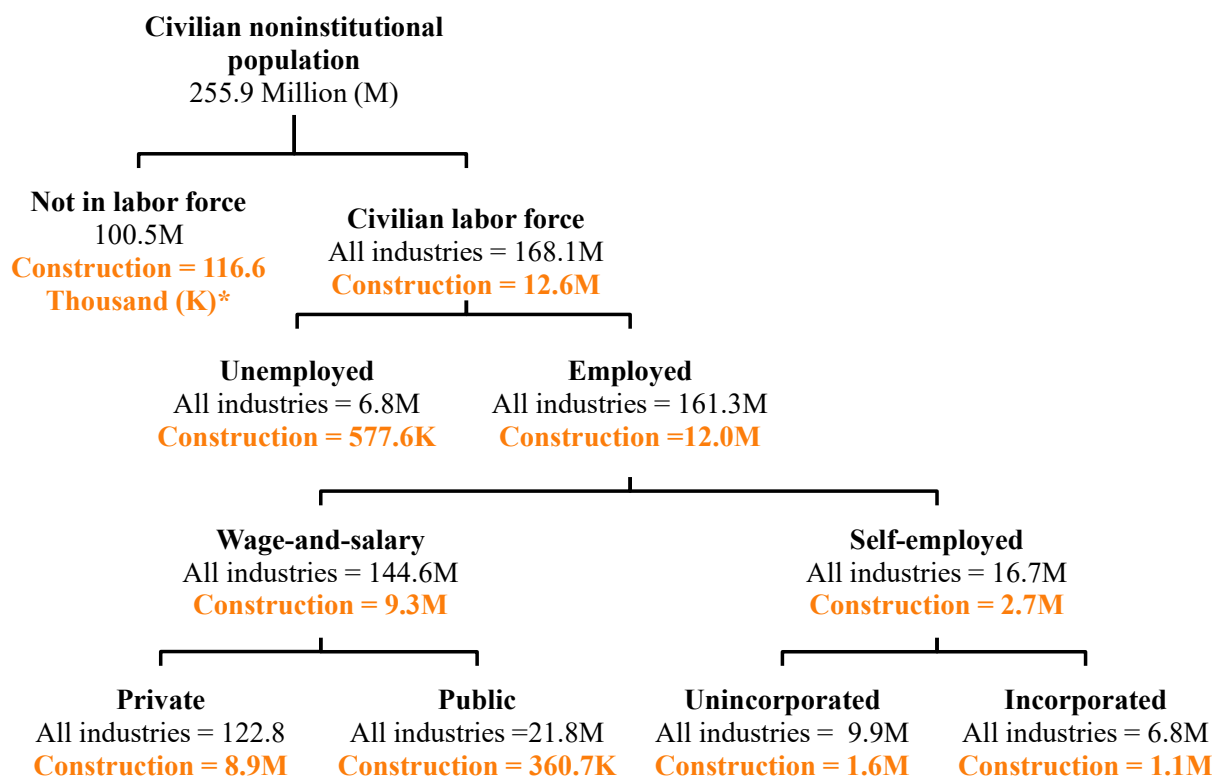
Labor force characteristics, such as statistics on unemployment and self-employment, tell us about the health of the economy overall and the construction industry. In addition, these characteristics can also be used to understand the workforce, which can guide prevention efforts. The construction industry is diverse with higher self-employment than most industries. This chapter provides an overview of the construction labor force, while Chapter 10 examines Employment Trends.

In 2024, construction workers accounted for 7.5% of the *civilian labor force*. A strong majority of those in construction were *employed* (95.2%; n=12.0 million (M)), with 4.8% (n=577.6 thousand (K)) *unemployed*. In comparison, 95.9% (n=161.3M) of all workers in 2024 were employed and 4.1% (n=6.8M) were unemployed. The finding of a slightly higher unemployment rate in construction is consistent with published literature (BLS, 2016).

FINDINGS

Just over three-quarters (77.5%; 12.0M) of those employed in the construction industry were *wage-and-salary* workers rather than self-employed (22.5%; n=2.7M; Chart 9a). In comparison, 89.6% of those employed in all industries (n=144.6M) were wage-and-salary and 10.4% (n=16.7M) were *self-employed*. Prior research found that construction had a higher percentage of self-employment than all industries (Gallagher, 2022). An overwhelming majority of wage-and-salary workers were *private* for both construction (95.7%; n=8.9M) and all industries (85.0%; n=122.8M) in 2024, while a majority of self-employed workers were *unincorporated* (e.g., freelancers, independent contractors/consultants) in both construction (59.3%; n=1.6M) and all industries (59.3%; n=9.9M).

Chart 9a. Type of labor force and class of workers, construction and all industries, 2024



Source: IPUMS, 2024 Current Population Survey.

*Reported industry not available for a majority of those not in the labor force.

TAKEAWAYS

The construction industry labor force has typically had a slightly higher unemployment rate and a higher percentage of self-employed workers than in the economy overall. Self-employment is higher in construction due to the nature of the work and opportunities for independent contractors—find more information in Chapter 23: Self-employed Workers. More information on employment trends in construction can be found in Chapter 10: Employment Trends.

RELATED CPWR PRODUCTS

- CPWR—The Center for Construction Research and Training. [2025]. Employment Trends. [dashboard]. www.cpwr.com/research/data-center/construction-chart-book/interactive-7th/employment-income/.
- CPWR—The Center for Construction Research. [2025]. Self-employed Workers. [dashboard]. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/employment-income/.

DEFINITIONS

- **Civilian labor force** – Individuals 16 years and older who are working (employed) or actively looking for work (unemployed).
- **Civilian noninstitutional population** – Individuals who are 16 years or older that are not active-duty military and do not reside in institutional settings (e.g., prison, nursing homes).
- **Employment Status** –
 - **Employed** – Individuals who were actively working or were temporarily absent the previous week due to illness, vacation, weather, or a labor dispute.
 - **Private** – Workers who work for individuals or companies.
 - **Public** – Workers who work for the local, state, or federal government.
 - **Self-employed** – Individuals who work for themselves or their own legal corporation.
 - ◻ **Unincorporated** – Self-employed individual who works for themselves apart from an established corporation (e.g., freelancers, independent contractors, and independent consultants).
 - **Wage-and-salary** – Workers who receive wages, salaries, commissions, tips, or pay from their employer.
 - **Unemployed** – Individuals who were not working at the time of the survey but reported looking for work in the past four weeks.

DATA SOURCES AND NOTES

Sarah Flood, Miriam King, Renae Rodgers, Steven Ruggles, J. Robert Warren, and Michael Westberry. Integrated Public Use Microdata Series, 2024 Current Population Survey: Version 9.0 [dataset]. Minneapolis, MN: IPUMS, 2025. doi.org/10.18128/D030.V9.0.

REFERENCES

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- Gallagher, Claire McAnaw. (2022). The Construction Industry: Characteristics of the Employed, 2003–20. www.bls.gov/spotlight/2022/the-construction-industry-labor-force-2003-to-2020/home.htm.

Employment Trends

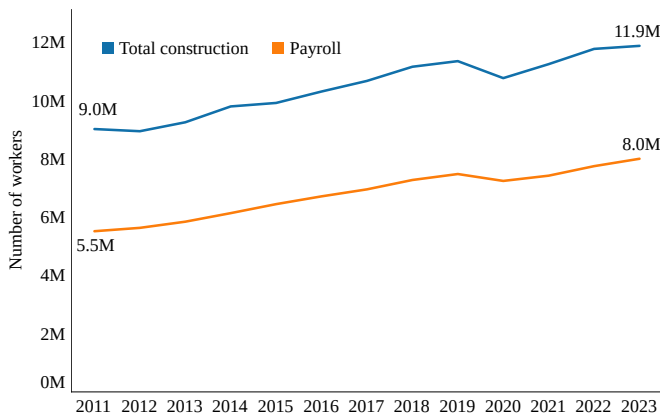
Insights into the construction labor market, including employment trends, provide information about both the overall economy and industry performance, such as growing numbers of workers in specific demographics and *occupations*. Since 2007, events that have affected the workforce overall, such as the *Great Recession* and the *COVID-19 pandemic*, have impacted construction as well. Monitoring the construction industry is particularly important because it is rapidly growing: from 2011 to 2021 employment grew twice as fast as that in all industries from 2011 to 2021 (Harris et al., 2022).

Employment in construction is also a critical factor in occupational safety and health. Not only does a growing number of workers mean greater potential for exposure to workplace hazards, but data on specific trends build understanding of potential exposures and need for interventions (Harris et al., 2022). This chapter examines recent employment trends in construction.

FINDINGS

From 2011 to 2023, *payroll construction* employment grew 45.0%, while construction employment overall increased 31.6% (Chart 10a). From 2019 to 2020, total employment in the industry fell 5.1%; the COVID-19 pandemic had a smaller impact across payroll employment, with a decline of 3.2%. From 2021 to 2023, payroll employment rose 7.8%, higher than the 5.6% growth in construction overall.

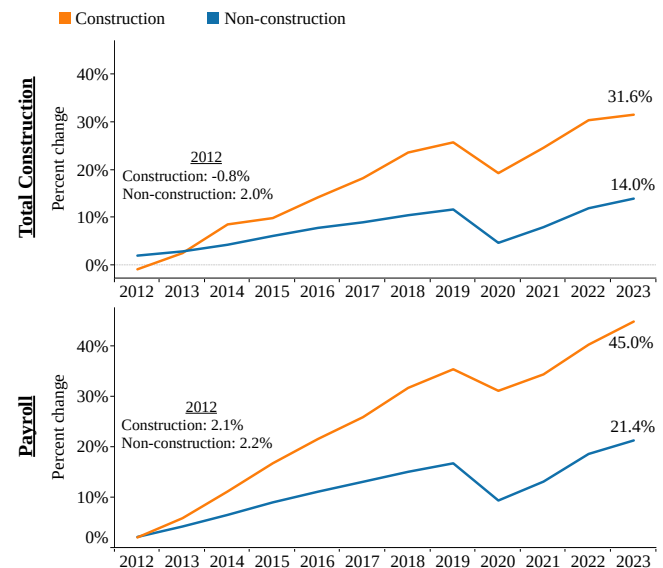
Chart 10a. Employment among payroll and all construction (2011-2023)



Source: IPUMS, 2011-2023 Current Population Survey and U.S. Bureau of Labor Statistics, Current Employment Statistics, 2011-2023.

Employment in construction grew more quickly than in non-construction from 2011 and 2023 for both total employment (31.6% versus 14.0%, respectively) and payroll employment (45.0% versus 21.4%, respectively; Chart 10b). The growth in construction occurred primarily from the recovery after the Great Recession, which had affected construction more than most industries (Hadi, 2011).

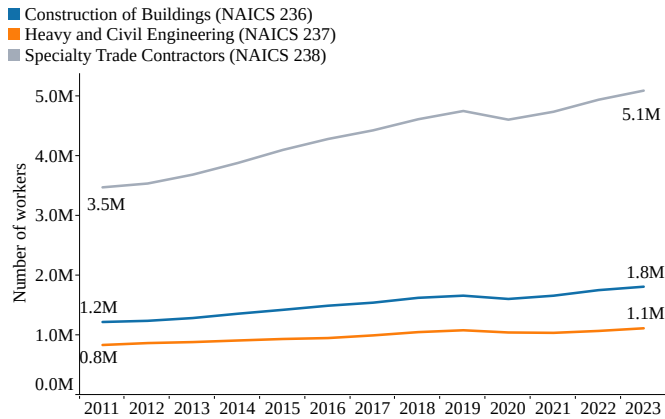
Chart 10b. Percent change since 2011 in employment among payroll and all construction, by industry (2012-2023)



Source: IPUMS, 2011-2023 Current Population Survey and U.S. Bureau of Labor Statistics, Current Employment Statistics, 2011-2023.

Specialty Trade Contractors employed 63.3% of payroll workers in construction from 2011 to 2023 (Chart 10c; data not shown). Over that period, employment at payroll Specialty Trade Contractors (NAICS 238) increased 46.6% (3.5M to 5.1M), while at Construction of Buildings (NAICS 236) it grew 48.3% (1.2M to 1.8M) and at Heavy and Civil Engineering (NAICS 237) rose 33.5% (0.8M to 1.1M).

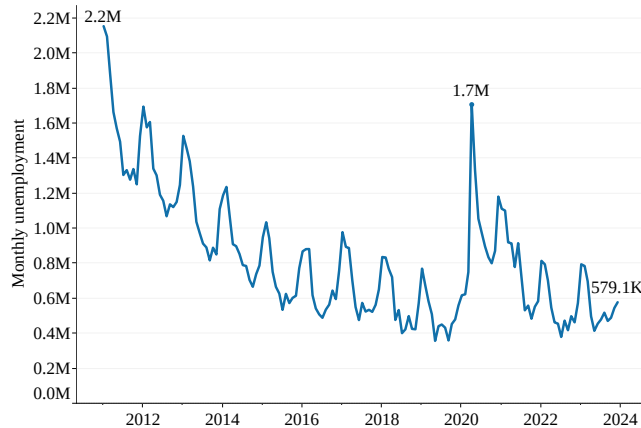
Chart 10c. Payroll employment, by major subsector (2011-2023)



Source: U.S. Bureau of Labor Statistics, 2011-2023 Current Employment Statistics.

Since 2011, unemployment in construction has fallen dramatically, from 1.3 million (M) workers in July 2011 to 480.5K in July 2023 (Chart 10d). This decline reflects the industry's recovery following the Great Recession and a faster recovery following the onset of the COVID-19 pandemic, with unemployment levels reaching pre-pandemic norms by August 2021 (Harris et al., 2022). Typically, winter sees the most *unemployed* construction workers, around 800K, compared to 400K during the summer.

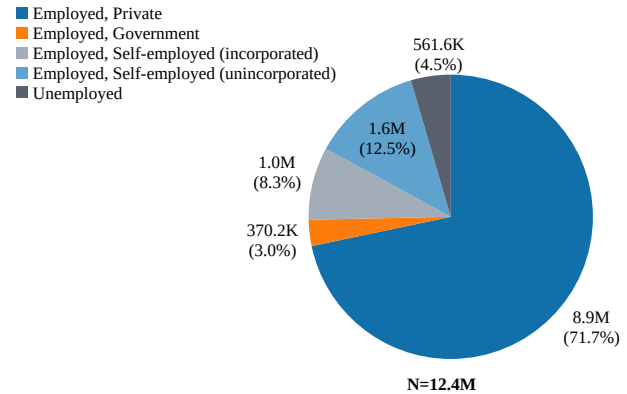
Chart 10d. Monthly construction unemployment (2011-2023)



Source: IPUMS, 2011-2023 Current Population Survey.

The construction *labor force* on the whole was also examined for 2023 (Chart 10e). In 2023, there were 561.6K unemployed construction workers. For *employed* workers, 75.0% (n=8.9M) were *private* employees, while 2.6M (21.8%) were *self-employed*. Of the latter group, 60.3% (n=1.6M) were *unincorporated*.

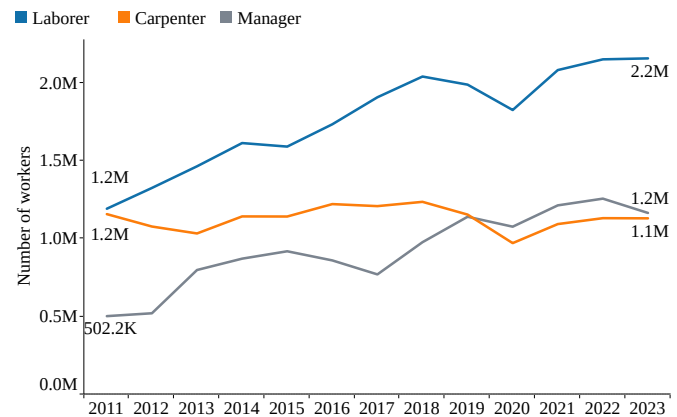
Chart 10e. Construction workforce composition (2023)



Source: IPUMS, 2023 Current Population Survey.

The three most common construction occupations in 2023 were also analyzed by year (Chart 10f). From 2011 to 2023, the number of carpenters fluctuated between 1.0 and 1.2M, and shrunk 2.3% overall. Laborers and managers both saw marked increases over the period, growing 81.0% (1.2M to 2.2M) and 131.8% (502.2K to 1.2M), respectively.

Chart 10f. Employment in the top 3 construction occupations, by year (2011-2023)



Source: IPUMS, 2011-2023 Current Population Survey.

TAKEAWAYS

From 2011 to 2023, construction employment grew 31.6%. Not only did it increase faster than all industries (+14.0%), but there were also reductions in unemployment over that period. Construction employment was not hit as hard as all industries overall by the COVID-19 pandemic, and most recently, employment growth continues to outpace all industries, highlighting the resiliency of the industry.

The number of workers in some of the most common construction occupations, such as laborers (+81.0%) and managers (+131.8%) have continued to climb rapidly over the period, while the number of carpenters has remained relatively consistent (-2.3%) from 2011 to 2023 amidst increased need for carpentry work (Phillips, 2023). This statistic highlights how employment trends can be used to identify workforce needs for various trades.

RELATED CPWR PRODUCTS

- CPWR—The Center for Construction Research and Training. [2025]. Employment Trends. [dashboard]. www.cpwr.com/research/data-center/construction-chart-book/interactive-7th/employment-income/.
 - o This interactive data dashboard corresponds to the current chapter.

DEFINITIONS

- **COVID-19 Pandemic** – A global outbreak of coronavirus that resulted in quarantines and social distancing protocols starting in March 2020 throughout 2021.
- **Employment Status** –
 - o **Employed** – Individuals who were actively working or were temporarily absent the previous week due to illness, vacation, weather, or a labor dispute.
 - **Government** – Workers who work for the local, state, or federal government.
 - **Private** – Workers who work for the local, state, or federal government.
 - **Self-employed** – Individuals who work for themselves or their own legal corporation.
 - **Unincorporated** – Self-employed individual who works for themselves apart from an established corporation (e.g., freelancers, independent contractors, and independent consultants).
 - o **Unemployed** – Individuals who were not working at the time of the survey but reported looking for work in the past four weeks.
- **Great Recession** – Period from 2007 to 2010 during which there was a decline in the global economy.
- **Labor force** – Individuals 16 years and older who are working (employed) or actively looking for work (unemployed).
- **Major subsector** – 3-digit NAICS code within construction (NAICS 23). See Chapter 1 "Pulling and Classifying Data" for details.
- **Occupation** – The primary occupation of the respondent with the most hours worked during the preceding week if employed.
- **Payroll construction** – Workers in construction who received wages and salaries as payment.

DATA SOURCES AND NOTES

Sarah Flood, Miriam King, Renae Rodgers, Steven Ruggles, J. Robert Warren, and Michael Westberry. Integrated Public Use Microdata Series, 2011-2023 Current Population Survey: Version 9.0 [dataset]. Minneapolis, MN: IPUMS, 2024. doi.org/10.18128/D030.V9.0.

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- Harris, W., Brown, S., & Trueblood, A. (2022). Employment Trends and Projections in Construction. www.cpwr.com/wp-content/uploads/DataBulletin-March2022.pdf.
- Phillips, Z. (2023, January 12). The hardest construction jobs to fill. 2023 OUTLOOK. www.constructiondive.com/news/hardest-construction-jobs-to-fill-in-2023/638993/.

Characteristics of Construction Workers

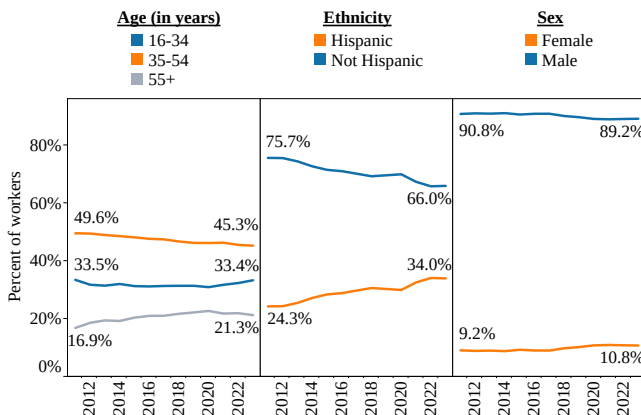
The construction workforce has grown and changed substantially over the past 13 years (Harris et al., 2023). While continuing its recovery from the *Great Recession*, the industry also followed a number of trends in the overall U.S. economy, including an aging workforce, labor shortages amid lower labor force participation, and a greater reliance upon immigrant workers, especially those who are Hispanic (Howard et al., 2021; Melhorn et al., 2023).

This chapter provides an overview of how the makeup of the construction workforce has changed in the past decade, highlighting a few selected demographics and characteristics which are covered in greater detail in Chapters 12 to 29. Monitoring demographics of workers alongside injury trends can assist with intervention and prevention efforts: for example, almost a third of fatal injuries occurred among aging workers (55 years or older: Trueblood et al., 2024).

FINDINGS

From 2011 to 2023, a few key demographics in construction saw steady increases in their share of the industry's workforce (Chart 11a). Among them were workers aged 55 years or older, who increased from 16.9% to 21.3% of the workforce (+26.0%); Hispanics, from 24.3% to 34.0% (+39.9%), and women, from 9.2% to 10.8% (+17.4%). Notably, the percentage of the workforce that was 16 to 34 years old dipped for most of the period but began to rise in 2021 and was back to 2011 levels by 2023. The percentage of workers 35 to 54 years old decreased 8.7% (49.6% to 45.3%) during the same period.

Chart 11a. Demographics of construction workers (2011-2023)



Source: IPUMS, 2011-2023 Current Population Survey.

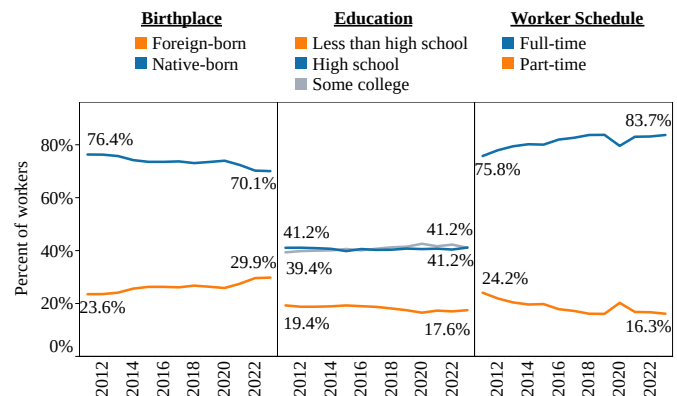
TAKEAWAYS

The construction workforce has seen an increase in workers who are Hispanic, born outside of the U.S., aging (55 years and older), women, and who have higher educational attainment. In addition, within construction more workers report working full-time at their primary job. These changes match with the U.S. workforce overall (Melhorn et al., 2023; Nash, 2024).

Although demographics in construction continue to change, it remains critical to make sure that safety interventions and outreach are effective. Due to their growing share of the construction workforce and their higher-than-average injury risk, aging workers

Characteristics of construction workers, such as *birthplace*, education, and *worker schedule* were also examined (Chart 11b). From 2011 to 2023, there were increases in the percentages of construction workers who were: foreign-born (+26.7%, from 23.6% to 29.9% of the entire construction workforce); had at least some college education (+8.0%, from 37.7% to 40.7%); and worked full-time (+10.4% from 75.8% to 83.7%, +10.4%).

Chart 11b. Additional characteristics of construction workers (2011-2023)



Source: IPUMS, 2011-2023 Current Population Survey.

and Hispanic workers in construction have additional, more detailed pages in this section (Trueblood et al., 2024). Understanding the patterns of employment among women construction workers can assist in identifying specific safety measures, such as PPE designed for workers' physical traits, which can help decrease risks of exposures and injuries (Trueblood et al., 2023; OSHA, n.d.).

RELATED CPWR PRODUCTS

- CPWR–The Center for Construction Research and Training. [2025]. Demographics of Construction Workers. [dashboard]. cpwr.com/research/data-center/construction-chart-book/interactive-7th/employment-income/.
 - This interactive data dashboard corresponds to the current chapter examining worker characteristics. It provides charts and text that can be filtered by demographics.
- CPWR–The Center for Construction Research and Training. [2025]. Hispanic Employment Trends. [dashboard]. cpwr.com/research/data-center/construction-chart-book/interactive-7th/employment-income/.
- CPWR–The Center for Construction Research and Training. [2025]. Foreign-Born Workers. [dashboard]. cpwr.com/research/data-center/construction-chart-book/interactive-7th/employment-income/.
- CPWR–The Center for Construction Research and Training. [2025]. Women in Construction. [dashboard]. cpwr.com/research/data-center/construction-chart-book/interactive-7th/employment-income/.

DEFINITIONS

- **Birthplace** – Indicates if the worker was born within or outside of the U.S.
 - **Foreign-born** – Those who were born outside of the U.S.
 - **Native-born** – Those born in the U.S. or those born abroad to U.S. parents.
- **Great Recession** – Period from 2007 to 2010 during which there was a decline in the global economy.
- **Worker Schedule**
 - **Full-time** – Individuals who usually worked 35 or more hours a week at their primary job.
 - **Part-time** – Individuals who usually worked 34 hours or less a week at their primary job.

DATA SOURCES AND NOTES

Sarah Flood, Miriam King, Renae Rodgers, Steven Ruggles, J. Robert Warren, Daniel Backman, Annie Chen, Grace Cooper, Stephanie Richards, Megan Schouweiler, and Michael Westberry. IPUMS CPS: Version 12.0 [dataset]. Minneapolis, MN: IPUMS, 2024. doi.org/10.18128/D030.V12.0.

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Trueblood, A.B., Harris, W., Yohannes, T. (2023). Women in Construction: Employment, Business Owner, and Injury Trends. cpwr.com/wp-content/uploads/DataBulletin-May2023.pdf.

Trueblood, A.B., Harris, W., Yohannes, T. (2024). Fatal Injury Trends in the Construction Industry. cpwr.com/wp-content/uploads/DataBulletin-July2024.pdf.

Union Membership

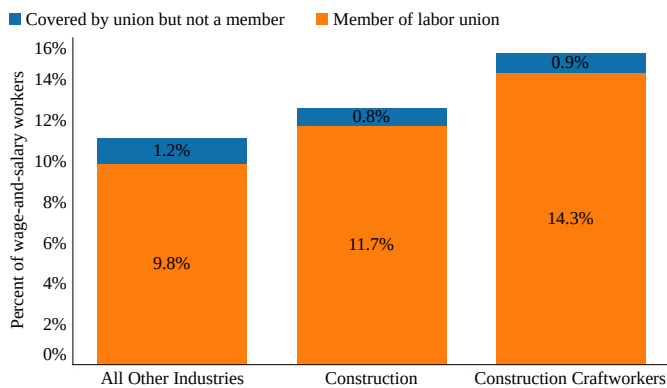
Union membership has many advantages for workers, including higher wages and benefits (e.g., insurance, pension plans) and improved workplace conditions (AFL-CIO, n.d., LIUNA, n.d.). The Economic Policy Institute (EPI) reports that unionization is not only good for workers, but can also help local communities (Banerjee et al., 2021). For example, states with high union membership have higher state minimum wages and median annual incomes.

Identifying and monitoring union membership trends provides details about on the construction workforce, as well as information that could be helpful for recruiting workers to the industry and unions. This chapter examines union membership among wage-and-salary construction workers by demographics and occupations.

FINDINGS

By industry, construction *craftworkers* had the highest percentage of *union members* (14.3%) from 2022 to 2024, a rate 1.2 times higher than that for all construction (11.7%; Chart 12a). In comparison, 9.8% of all workers in all other industries were union members.

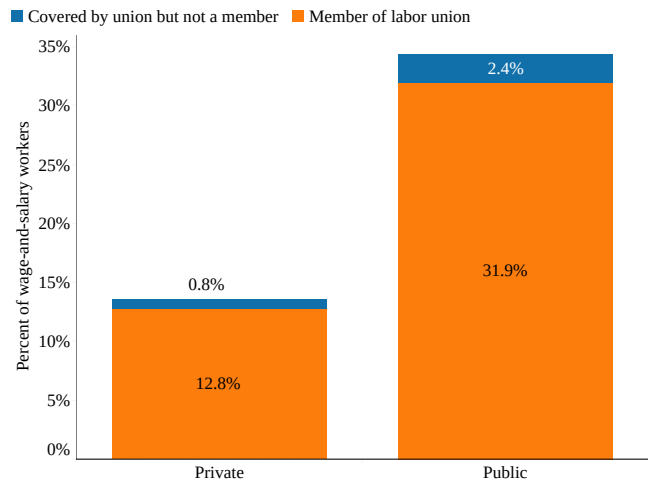
Chart 12a. Union membership, by industry (2022-2024)



Source: IPUMS, 2022-2024 Current Population Survey.

From 2022-2024, construction workers employed in public industry (e.g., government) were 2.5 times more likely to be union members than those in private industry (e.g., private construction companies; 31.9% versus 12.8%; Chart 12b).

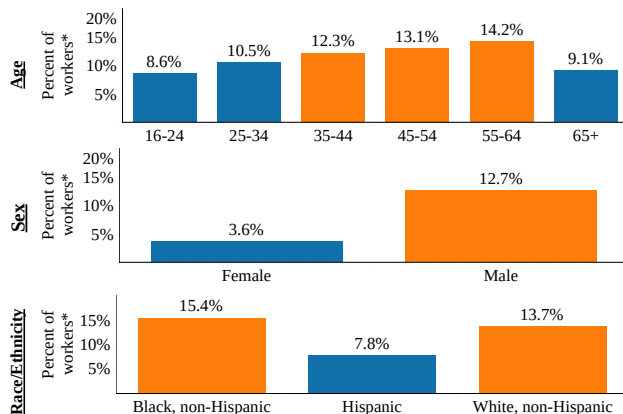
Chart 12b. Union membership among class of worker, private versus public industry (2022-2024)



Source: IPUMS, 2022-2024 Current Population Survey.

Union membership among construction workers was examined for selected demographics from 2022 to 2024 (Chart 12c). The age group with the highest percentage of union members were those 55 to 64 years old (14.2%); while those with the lowest percentage were 16 to 24 years old. By sex, males were more likely to be union members than females, 12.7% to 3.6% of workers, respectively. Non-Hispanic workers reported the highest union rates, with 15.4% of black, non-Hispanic and 13.7% of white, non-Hispanic workers being members.

Chart 12c. Union membership, by age, sex, and race/ethnicity (2022-2024)[^]



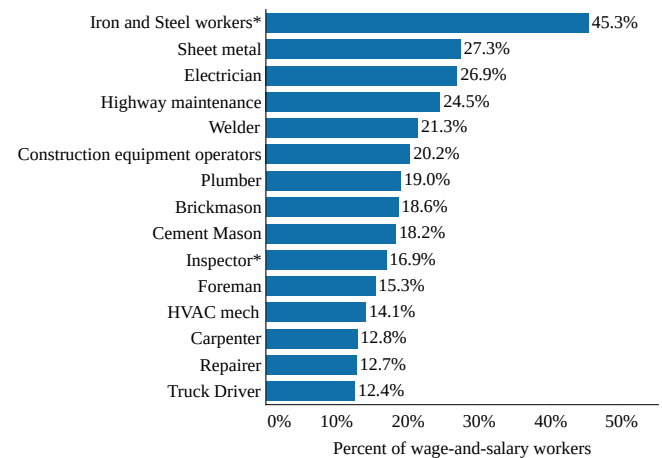
Source: IPUMS, 2022-2024 Current Population Survey.

*Wage-and-salary workers.

[^]Orange bars indicate a higher union membership percentage compared to all construction (11.7%).

Of occupations examined, there were 15 with higher percentages of union members than all construction (11.7%; Chart 12d). The highest percentage was among iron and steel workers (45.3%), followed by sheet metal workers (27.3%) and electricians (26.9%).

Chart 12d. Occupations among construction workers with higher union membership than all construction (2022-2024)



Source: IPUMS, 2022-2024 Current Population Survey.

*Occupation had low frequencies on average ($N \leq 30$) for the time period and should be interpreted with caution.

TAKEAWAYS

As union membership changes among construction workers, identifying and monitoring occupations and demographics with higher and lower rates can be helpful in recruitment and retention of construction workers. For example, females, Hispanic, and younger construction workers were less likely to be union members than their counterparts.

RELATED CPWR PRODUCTS

- CPWR–The Center for Construction Research and Training. [2025]. Union Membership. [dashboard]. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/employment-income/.
 - o This interactive data dashboard corresponds to the current chapter examining union membership. It provides charts and text that can be filtered by year.

DEFINITIONS

- **Craftworkers** – *All workers except those who are managerial, professional, or administrative support. Also called blue-collar or production workers.*
- **Occupation** – *The primary occupation of the respondent with the most hours worked during the preceding week if employed.*
- **Union status** – *Indicates for the current job if the respondents were a member of a labor union or an employee association.*
 - **Non-union member** – *Respondent was not a member.*
 - **Union member** – *Respondent was a member.*
- **Wage-and-salary** – *Individuals who receive wages, salaries, commissions, tips or payment in kind from their employer.*

DATA SOURCES AND NOTES

Sarah Flood, Miriam King, Renae Rodgers, Steven Ruggles, J. Robert Warren, Daniel Backman, Annie Chen, Grace Cooper, Stephanie Richards, Megan Schouweiler, and Michael Westberry. IPUMS CPS: Version 12.0 [dataset]. Minneapolis, MN: IPUMS, 2024. doi.org/10.18128/D030.V12.0.

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LIUNA! Northwest Region. (n.d.). Benefits of Union Membership. www.nwliuna.org/benefits-of-union-membership.

Worker Age in Construction

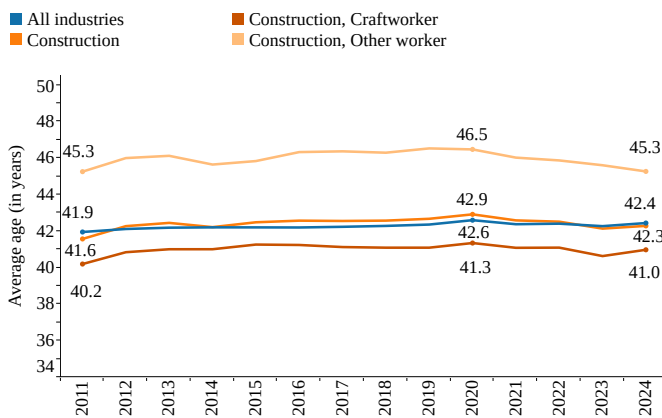
The demographics of the U.S. population are shifting, including its age distribution. From 2016 to 2060, the number of individuals who are 65 years or older is expected to nearly double, from 49 million to 95 million (Vespa, 2020). Many Americans are working longer, for reasons such as enjoying their jobs and social interactions, as well as needing the income and/or benefits (AARP, n.d.).

Given the change in the overall population, construction workers' age distribution should be examined, as older workers (55+ years old) may need additional support to stay in their jobs (CPWR, n.d.). In addition, knowing the industry's age distribution can help with the development and implementation of health interventions. For example, workers under 30 have been found to absorb information differently than older workers (Cable, 2005). This chapter and Chapter 14: Age of Construction Workers by Select Demographics and Characteristics examines recent age trends, while Chapter 15: Aging Workers examines trends for workers 55 years or older.

FINDINGS

From 2011 to 2024, the *average age* of construction workers increased 1.7% (from 41.6 to 42.3 years; Chart 13a). Meanwhile, the average age of workers in all industries increased 1.2% (from 41.9 to 42.4 years). Across all categories examined, the average age of workers was highest in 2020, a spike likely driven by high unemployment among young workers during the pandemic (Falk, 2021). Though the average age of workers decreased in construction and all industries from 2021 to 2023, the average age in both groups increased in 2024.

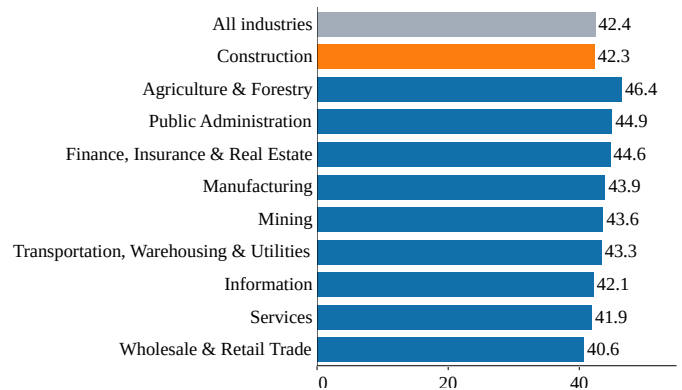
Chart 13a. Average age, construction versus all industries (2011-2024)



Source: IPUMS, 2011-2024 Current Population Survey.

When looking at workers by industry, in 2024 the average age in construction was slightly lower than the average age in all industries combined (42.3 versus 42.4 years; Chart 13b). Construction had one of the youngest workforces and was slightly older, on average, than workers in the wholesale and retail (40.6 years), services (41.9 years) and information (42.1 years) industries.

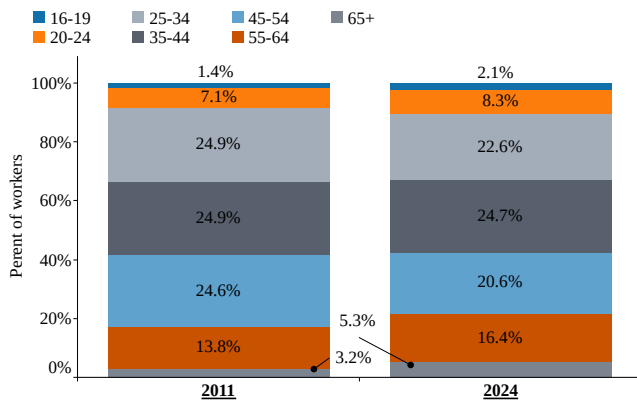
Chart 13b. Average age of workers, by industry (2024)



Source: IPUMS, 2024 Current Population Survey.

The age distribution in construction in 2011 and 2024 was examined next (Chart 13c). Of all age groups, the most noticeable increases were among the oldest and youngest workers. From 2011 to 2024, the proportion of workers aged 65+ and 16-19 years increased 67.2% and 49.7%, respectively. These figures are consistent with prior findings showing increases in both older workers and younger Hispanic workers in the industry (Harris et al., 2022; Trueblood et al., 2024). Notable increases were also observed in the proportion of workers aged 55-64 (+18.5%) and 20-24 years old (+16.0%). From 2011 to 2024, the largest decline in the proportion of workers was among those aged 45-54 years (-16.5%), and the proportion of workers aged 25-34 and 35-44 years old declined by -9.4% and -0.6%, respectively.

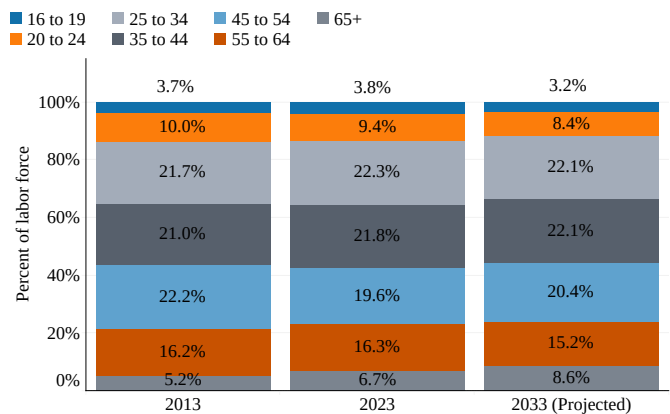
Chart 13c. Age distribution in construction, 2011 versus 2024



Source: IPUMS, 2011 and 2024 Current Population Survey.

Lastly, the projected composition of the U.S. *civilian labor force* across all industries was examined. From 2023 to 2033, the proportion of workers under 24 years old is expected to decrease from 13.2% to 11.6% (Chart 13d). In comparison, workers 65 years or older are projected to increase from 6.7% to 8.6%. These trends show why it is necessary to monitor aging workers to guide recruiting efforts, as well as safety and health interventions (Trueblood et al., 2024).

Chart 13d. Age distribution of U.S. labor force (2013, 2023, and 2033)



Source: BLS, Table 3.1 Civilian labor force by age, sex, race, and ethnicity, 2003, 2013, 2023, and projected 2033.

TAKEAWAYS

As construction workers continue to work longer, the average age of the workforce increases and its composition changes. Therefore, it is important to understand and monitor demographic shifts in the workforce, which can guide research and intervention efforts.

To address workers' needs as they age, it's important for employers to create age-friendly workplaces that benefit all workers, such as matching tasks to abilities, providing reasonable accommodation after injuries, and offering age-inclusive management training. Sokas et al. (2019) highlights other ways to build a sustainable construction workforce that address aging concerns, such as career pathways for training and mentoring/pairing opportunities.

RELATED CPWR PRODUCTS

- Brooks, R.D., Trueblood, A.B., Dufoe, D., Harris, W. [2025]. Aging and Retirement Trends in the Construction Industry. www.cpwr.com/wp-content/uploads/DataBulletin-February2025.pdf.
- CPWR—The Center for Construction Research and Training. [n.d.]. Aging Workers. www.cpwr.com/research/management-resources-from-research/aging-workers/.
- CPWR—The Center for Construction Research and Training. [2025]. Worker Age in Construction. [dashboard]. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/employment-income/.
 - This interactive data dashboard corresponds to the current and following chapter examining construction worker age. It provides charts and text that can be filtered by year.

DEFINITIONS

- **Average age** – The mean age of workers.
- **Civilian labor force** – All people 16 years or older who are employed or unemployed. Also described as the number of people who are working or actively looking for work.

DATA SOURCES AND NOTES

Sarah Flood, Miriam King, Renae Rodgers, Steven Ruggles, J. Robert Warren, Daniel Backman, Annie Chen, Grace Cooper, Stephanie Richards, Megan Schouweiler, and Michael Westberry. IPUMS CPS: Version 12.0 [dataset]. Minneapolis, MN: IPUMS, 2024. doi.org/10.18128/D030.V12.0.

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Harris, W., Brown, S., & Trueblood, A. B. (2022). Employment trends and projections in construction. CPWR Data Bulletin. www.cpwr.com/wp-content/uploads/DataBulletin-March2022.pdf.

National Institute for Occupational Safety and Health (NIOSH). (n.d.). About Productive Aging and Work. www.cdc.gov/niosh/aging/about/index.html.

Sokas, R. K., Dong, X. S., & Cain, C. T. (2019). Building a sustainable construction workforce. International Journal of Environmental Research and Public Health, 16(21), 4202. www.mdpi.com/1660-4601/16/21/4202.

Trueblood, A.B., Dufoe, D., Brooks, R.D., Harris, W.H. (2024). Hispanic Construction Workers: Employment, Business Ownership, and Injury Trends. CPWR Data Bulletin. www.cpwr.com/wp-content/uploads/DataBulletin-December2024.pdf.

Vespa, Jonathan E., David M. Armstrong, and Lauren Medina. (2020). Demographic turning points for the United States: Population projections for 2020 to 2060. Washington, DC: US Department of Commerce, Economics and Statistics Administration, US Census Bureau, 2018. www.census.gov/content/dam/Census/library/publications/2020/demo/p25-1144.pdf.

Age of Construction Workers by Select Demographics and Characteristics

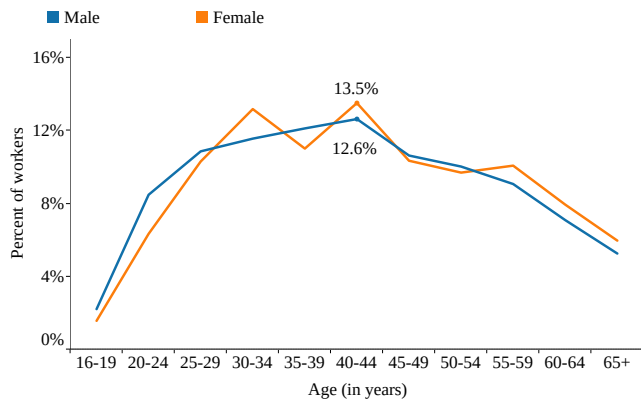
Because the construction workforce is aging, carefully monitoring that trend is important understanding the composition and potential needs of the workforce. Information on the workforce can be used to help guide research and age-appropriate intervention efforts to keep workers safely on the job (Brooks et al., 2025).

This chapter builds on Chapter 13: Worker Age in Construction by looking at the age of construction workers by sex, race/ethnicity, worker class, *union status*, and *worker type*.

FINDINGS

First, the age distribution of construction workers was evaluated by sex (Chart 14a). In 2024, male construction workers were younger, on average, than their female counterparts. One out of five (21.6%) male construction workers was under 30 years old in 2024, compared to 18.2% of female construction workers. In contrast, female construction workers were more likely than males to be 40 years or older (57.6% versus 54.7%).

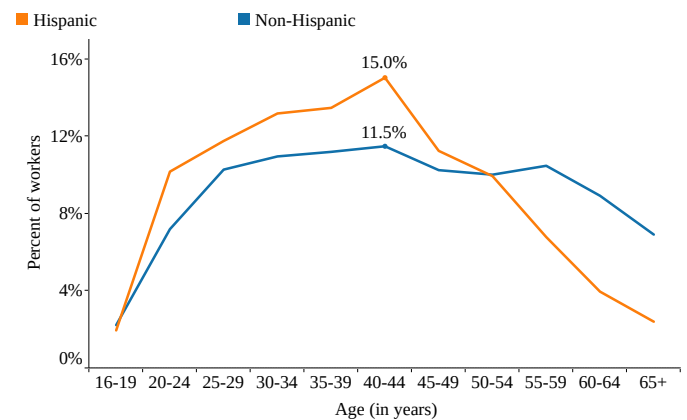
Chart 14a. Age distribution in construction, by sex (2024)



Source: IPUMS, 2024 Current Population Survey.

Next, age distribution was examined among construction workers by ethnicity (Chart 14b). In 2024, Hispanics had a higher proportion of workers under 25 years (12.1%) than non-Hispanics (9.4%; chart 5). In contrast, non-Hispanics (26.3%) had a higher proportion of workers 55 years and older than Hispanics (13.2%). This is consistent with prior findings that non-Hispanic white construction workers had one of the highest proportions of workers 55 years or older (Gallagher et al., 2022).

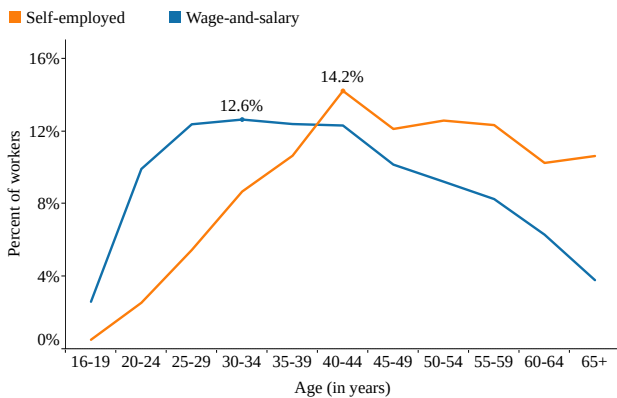
Chart 14b. Age distribution in construction, by ethnicity (2024)



Source: IPUMS, 2024 Current Population Survey.

Age distribution also varied by worker class. In construction, nearly half (49.9%) of wage-and-salary workers were under the age of 40 in 2024, while just over a quarter (27.9%) of self-employed workers were under 40 (Chart 14c). This observation is not particularly surprising, as the share of self-employed workers increases with age (Abraham et al., 2019).

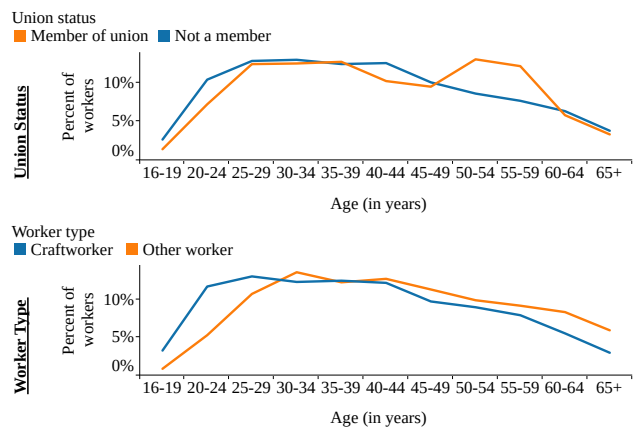
Chart 14c. Age distribution in construction, by class of worker (2024)



Source: IPUMS, 2024 Current Population Survey.

The age distribution among *wage-and-salary* workers was then examined by union status and worker type (Chart 14d). In 2024, workers under 25 years old were more likely to not be a union member (13.0% versus 8.6%). While, a higher percentage of union members were 50 years or older (34.2% versus 26.3%). This is consistent with findings from BLS that in 2024, workers 45 to 54 years old across all industries had the highest union membership rate (BLS, 2025). By worker type, *craftworkers* had a higher percentage of workers under 25 years old than other workers (15.0% versus 6.2%), while *other workers* had a higher percentage of workers 50 years or older than craftworkers (33.3% versus 25.4%).

Chart 14d. Age distribution in construction, by union status and worker type (2024; wage-and-salary)



Source: IPUMS, 2024 Current Population Survey.

TAKEAWAYS

The findings in this chapter show construction worker age by demographic and other characteristics, and tracking this information is important because the composition of the workforce is continually changing. These trends also inform employers, safety and health professionals, and others, in areas such as recruitment and retention and in efforts to keep workers healthy through prevention and intervention efforts.

RELATED CPWR PRODUCTS

- Brooks, R.D., Trueblood, A.B., Dufoe, D., Harris, W. [2025]. Aging and Retirement Trends in the Construction Industry. www.cpwr.com/wp-content/uploads/DataBulletin-February2025.pdf.
- CPWR—The Center for Construction Research and Training. [n.d.]. Aging Workers. www.cpwr.com/research/management-resources-from-research/aging-workers/.
- CPWR—The Center for Construction Research and Training. [2025]. Age of Construction Workers. [dashboard]. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/employment-income/.
 - This interactive data dashboard corresponds to the current and following chapter examining construction worker age. It provides charts and text that can be filtered by year.

DEFINITIONS

- **Union status** – Indicates for the current job if the respondents were a member of a labor union or an employee association.
 - **Non-union member** – For current job, the respondent had no union coverage or was covered by a union but not a member.
 - **Union member** – For current job, the respondent was a member of a labor union.
- **Wage-and-salary** – Individuals who receive wages, salaries, commissions, tips or payment in kind from their employer.
- **Worker type** – Indicates the type of work being performed.
 - **Craftworkers** – All workers except those who are managerial, professional, or administrative support. Also called blue-collar or production workers.
 - **Other workers** – Includes managerial, professional, and administrative support workers. Also called white-collar workers.

DATA SOURCES AND NOTES

Sarah Flood, Miriam King, Renae Rodgers, Steven Ruggles, J. Robert Warren, Daniel Backman, Annie Chen, Grace Cooper, Stephanie Richards, Megan Schouweiler, and Michael Westberry. IPUMS CPS: Version 12.0 [dataset]. Minneapolis, MN: IPUMS, 2024. doi.org/10.18128/D030.V12.0.

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Abraham, K.G., Hershbein, B., Houseman, S.N. (2019). Self-Employment at Older Ages. National Bureau of Economic Research. www.nber.org/brd/self-employment-older-ages.

Brooks, R.D., Trueblood, A.B., Dufoe, D., Harris, W. (2025). Aging and Retirement Trends in the Construction Industry. www.cpwr.com/wp-content/uploads/DataBulletin-February2025.pdf.

Gallagher, C.M. (2022). The Construction Industry: Characteristics of the Employed, 2003-20. U.S. Bureau of Labor Statistics. www.bls.gov/spotlight/2022/the-construction-industry-labor-force-2003-to-2020/.

U.S. Bureau of Labor Statistics (BLS). (2025). Union Members-2024. www.bls.gov/news.release/pdf/union2.pdf.

Aging Workers in Construction

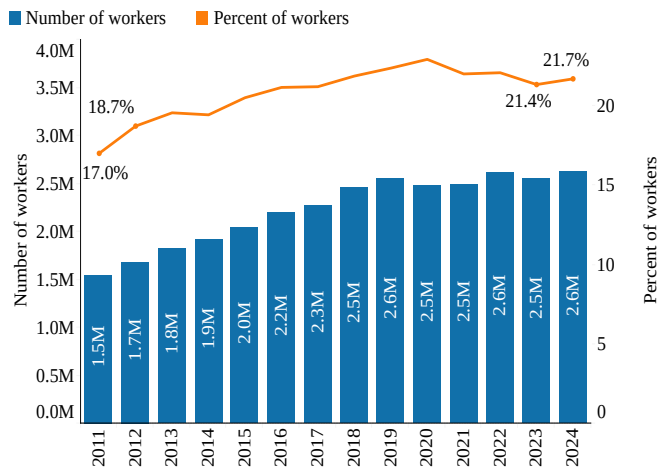
Aging workers—defined as those 55 years or older—accounted for 21.7% of the construction workforce in 2024 (See Chapter 13: Worker Age in Construction and Chapter 14: Age of Construction Workers by Select Demographics and Characteristics). These older workers bring knowledge and experience that is important for safe and successful projects, and understanding their role in the workforce can guide efforts to retain them, including practices that keep them safe and productive. This data can also highlight potential retirement patterns that could affect the industry.

This chapter provides a deep dive into aging worker employment trends, including changes over time, demographics and characteristics of aging workers, and occupations with the most aging workers.

FINDINGS

From 2011 to 2024, aging construction workers increased 73.3%, from 1.5 million (M) to 2.6M workers (Chart 15a). From 2011 to 2019, the number of aging workers increased every year, but their numbers declined in 2020 and 2021 when the COVID-19 pandemic was at its peak. Older adults were more vulnerable to COVID-19, and many chose to retire early (Phillips, 2025). Most recently, 1 in 5 construction workers were 55 years or older (21.7%) in 2024.

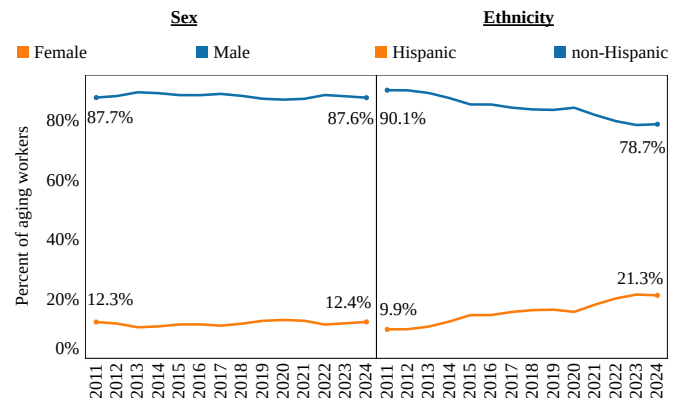
Chart 15a. Number and percent of aging workers (2011-2024)



Source: IPUMS, 2011-2024 Current Population Survey.

Looking at demographics, a significant majority of aging workers were male from 2011 to 2024, with 87.6% male in 2024 (Chart 15b). This is not surprising, as 89.2% of all construction workers were male in 2023 (CPWR, 2025). By *ethnicity*, a majority of aging construction workers were non-Hispanic (78.7% in 2024). The percentage of non-Hispanic aging workers decreased 12.7% from 2011 to 2024 (90.1% to 78.7%). This decline is consistent with the entire workforce, which experienced a 12.8% decline in non-Hispanic workers from 2011 to 2023 (CPWR, 2025).

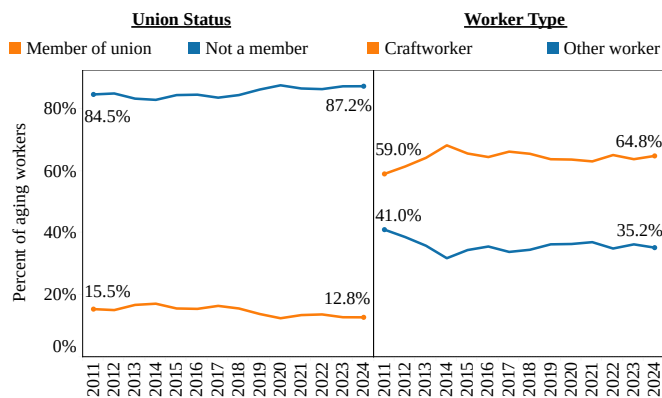
Chart 15b. Demographics of aging construction workers (2011-2024)



Source: IPUMS, 2011-2024 Current Population Survey.

Next, *union status* and *worker type* was examined for *wage-and-salary* aging construction workers (Chart 15c). A majority of aging construction workers were not union members—in 2024, for example, 87.2% were not. The percentage of aging workers who were union members decreased 17.4%, from 15.5% to 12.8%, from 2011 to 2024. By worker type, a majority of aging construction workers were *craftworkers*, who accounted for 64.8% of aging workers in 2024.

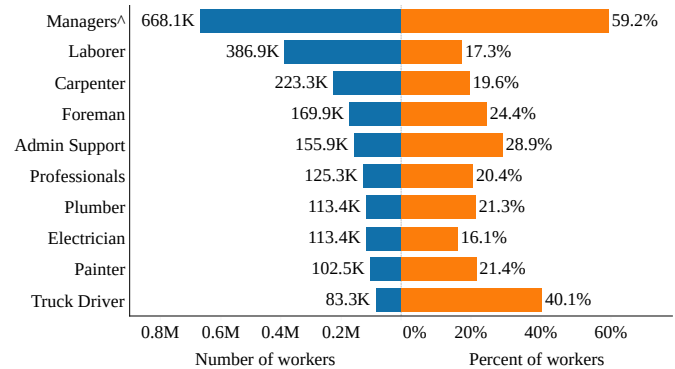
Chart 15c. Characteristics of aging construction workers (2011-2024; wage-and-salary)



Source: IPUMS, 2011-2024 Current Population Survey.

Lastly, the top ten *occupations* based on number of aging construction workers were examined (Chart 15d). Four occupations had a higher percentage of aging workers than all construction (21.7%; chart 1): managers (59.2%), truck drivers (40.1%), administrative support professionals (28.9%) and foremen (24.4%). The next two occupations with the highest percentage of workers 55 years or older were painters (21.4%) and plumbers (21.3%).

Chart 15d. Top 10 construction occupations* with number of aging workers (2024)



Source: IPUMS, 2024 Current Population Survey.

*Top 10 defined on number of aging workers.

^Combines managers and construction managers.

TAKEAWAYS

This chapter highlights demographics and characteristics of aging construction workers, which can be used to guide safety and health interventions to keep workers safe and healthy on jobsites for longer, as well as to guide recruitment efforts to address future labor needs.

As discussed in chapter 13, it's important for employers to address workers' needs as they age to create age-friendly workplaces that benefit all workers, such as career pathways for training and mentoring/pairing (Sokas et al., 2019).

RELATED CPWR PRODUCTS

- Brooks, R.D., Trueblood, A.B., Dufoe, D., Harris, W. [2025]. Aging and Retirement Trends in the Construction Industry. www.cpwrr.com/wp-content/uploads/DataBulletin-February2025.pdf.
- CPWR—The Center for Construction Research and Training. [n.d.]. Aging Workers. www.cpwrr.com/research/management-resources-from-research/aging-workers/.
- CPWR—The Center for Construction Research and Training. [2025]. Worker Age in Construction. [dashboard]. www.cpwrr.com/research/data-center/the-construction-chart-book/interactive-7th/employment-income/.
 - This interactive data dashboard includes a page looking at aging workers in construction.

DEFINITIONS

- **Aging workers** – Workers aged 55 years or older.
- **Ethnicity** – Separate from race, ethnicity is defined based on a respondent's self-reported Hispanic origin.
 - **Occupation** – The primary occupation of the respondent with the most hours worked during the preceding week if **employed**.
- **Union status** – Indicates for the current job if the respondents were a member of a labor union or an employee association.
 - **Non-union member** – For current job, the respondent had no union coverage or was covered by a union but not a member.
 - **Union member** – For current job, the respondent was a member of a labor union.
- **Wage-and-salary** – Individuals who receive wages, salaries, commissions, tips or payment in kind from their employer.
- **Worker type** – Indicates the type of work being performed.
 - **Craftworkers** – All workers except those who are managerial, professional, or administrative support. Also called blue-collar or production workers.
 - **Other workers** – Includes managerial, professional, and administrative support workers. Also called white-collar workers.

DATA SOURCES AND NOTES

Sarah Flood, Miriam King, Renae Rodgers, Steven Ruggles, J. Robert Warren, Daniel Backman, Annie Chen, Grace Cooper, Stephanie Richards, Megan Schouweiler, and Michael Westberry. IPUMS CPS: Version 12.0 [dataset]. Minneapolis, MN: IPUMS, 2024. doi.org/10.18128/D030.V12.0.

REFERENCES

CPWR–The Center for Construction Research and Training. (2025). Demographics of Construction Workers. [dashboard]. www.cpwrt.com/research/data-center/the-construction-chart-book/interactive-7th/employment-income/demographics-of-construction-workers/.

Phillips, Z. (2025). After 5 years, construction still reels from COVID's labor impact. Construction Dive. www.constructiondive.com/news/covid-impact-construction-labor-five-years/742445/.

Sokas, R. K., Dong, X. S., & Cain, C. T. (2019). Building a sustainable construction workforce. International Journal of Environmental Research and Public Health, 16(21), 4202. www.mdpi.com/1660-4601/16/21/4202.

Hispanic Workers in Construction

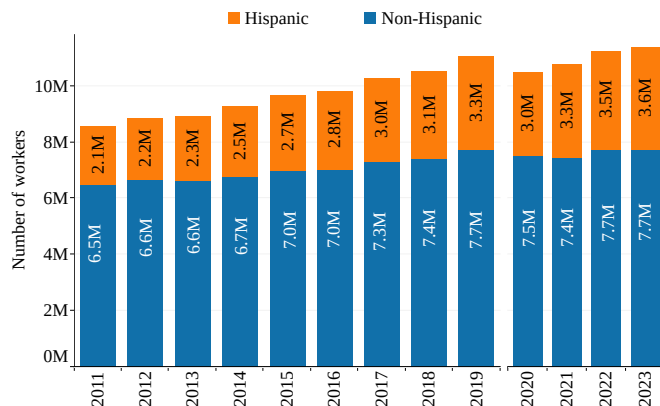
Hispanic workers represent almost a third of the construction workforce, and the charts below show how these numbers continue to grow. Understanding the role and composition of Hispanic workers in the industry provides information needed to address the changing needs of the labor force, including guiding safety and health interventions.

This chapter examines *ethnicity*, which is *self-reported* by individuals in the American Community Survey. This chapter does not examine *race* which is often intertwined with ethnicity; however, race and ethnicity are independent of each other, as Hispanics and non-Hispanics can report any race (Missouri Census Data Center, n.d.). Race is further examined in Chapter 20: Minority Workers. It is also important to note that different data sources use different race and ethnicity definitions.

FINDINGS

From 2011 to 2019, Hispanic employment in construction rose 59.9% (2.1M to 3.3M), outpacing the growth rate of non-Hispanic workers during that period (19.2%; Chart 16a). In 2011, Hispanic workers represented 21.5% of the construction workforce, a share that increased to 34.3% by 2019. From 2020 to 2023 Hispanic employment rose 20.0% (3.0M to 3.6M). This recent figure tracks with trends observed in the U.S. labor market at large, where Hispanic employment recovered much quicker following 2020 than after previous recessions (Gould, 2024).

Chart 16a. Hispanic employment in construction, by year (2011-2023*)

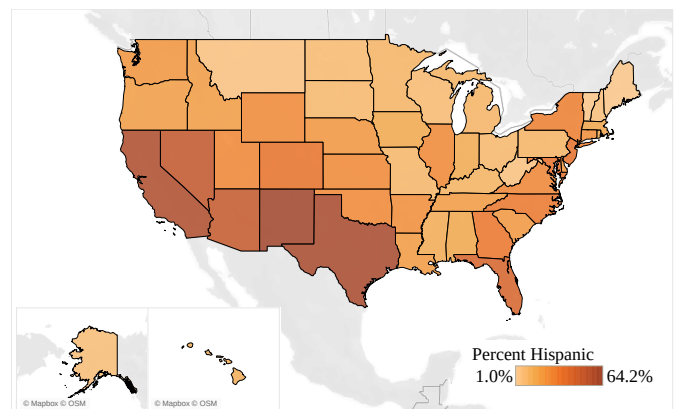


Source: IPUMS, 2011-2023 1-year U.S. Census ACS.

*Due to changes in data collection, pre- and post-2020 estimates of Hispanic employment are not comparable.

The percentage of a state's construction workforce that is Hispanic varies (Chart 16b). In 2022, the American Southwest had the highest percentages of Hispanic workers, led by New Mexico (64.2%), Texas (61.3%), and California (58.9%). Other notable states outside of the Southwest were Florida (42.6%), Maryland (34.7%), New Jersey (34.8%), and New York (29.1%). The three states with the smallest percent of Hispanic construction workers were Maine (1.0%), Vermont (1.3%), and West Virginia (3.3%). Many states that had a high percent of Hispanic construction workers also had a high number of fatal injuries (BLS, 2023). Knowing where Hispanic construction workers live in the U.S. helps focus safety and health efforts, especially as these workers live in areas with high demand for construction.

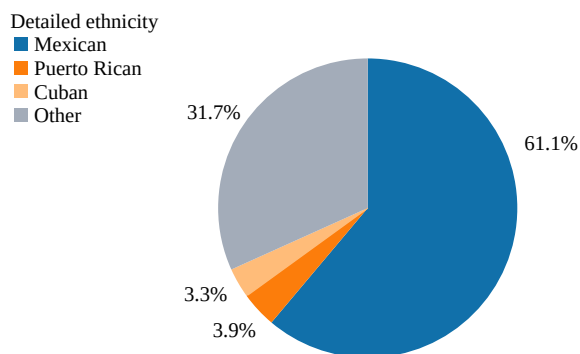
Chart 16b. Construction workforce, by percent Hispanic and state (2023)



Source: IPUMS, 2023 1-year U.S. Census ACS.

Workers who report being Hispanic or Latino(a) come from a set of diverse ancestries: the Pew Research Center found that more than half of surveyed individuals preferred to describe themselves by place of origin over the broad category of being Hispanic or Latino(a) (Lopez, Korstad, and Passel 2023). Information on *detailed ethnicity* categories helps us to better understand the makeup of the Hispanic workforce and the variations within the broad category of “Hispanic.” To address this, detailed Hispanic ethnicity for all Hispanic construction workers was examined (including foreign- and native-born workers) in 2023 which shows Hispanic ancestry (Chart 16c). Of the 31.3% of construction workforce that is Hispanic, nearly two-thirds were Mexican (61.1%), while 3.9% were Puerto Rican, and 3.3% were Cuban. Other Hispanic ethnicities (Nicaraguan, Venezuelan, Spanish, etc.) accounted for the remaining 31.7% of Hispanic workers. Construction workers’ detailed ethnicity distribution is comparable to that of all workers in the U.S. labor force (BLS, 2023).

Chart 16c. Hispanic employment in construction, by detailed ethnic group (2023)



Source: IPUMS, 2023 1-year U.S. Census ACS.

Hispanic ethnicity among construction *occupations* were then examined (Chart 16d). In 2023, 74.3% of drywall installers and 65.2% of roofers were Hispanic. Construction laborers had the highest number of Hispanic workers, with 961 thousand (K) in 2023, accounting for 26.7% of all Hispanics in construction that year (data not shown). These findings align with data from the BLS, which reports that Hispanic workers were underrepresented in management positions (BLS, 2022).

Chart 16d. Top construction worker occupations* based on number and percentage of Hispanic workers (2023)

Top occupations by percent of Hispanic workers		Top occupations by number of Hispanic workers	
Drywall	74.3% (n=89.5K)	Laborer	960.9K (52.4%)
Roofer	65.2% (n=133.5K)	Carpenter	401.6K (38.0%)
Plasterer	61.4% (n=14.3K)	Painter	304.4K (59.3%)
Painter	59.3% (n=304.4K)	Construction Manager	194.4K (17.4%)
Laborer	52.4% (n=960.9K)	Electrician	171.1K (23.9%)
Carpet and tile	51.4% (n=57.1K)	Foreman	161.7K (28.2%)
Helper	49.1% (n=18.0K)	Plumber	148.2K (27.1%)
Insulation worker	48.7% (n=20.0K)	Manager	142.2K (16.5%)
Cement Mason	47.8% (n=22.6K)	Roofer	133.5K (65.2%)
Brickmason	44.1% (n=53.0K)	Drywall	89.5K (74.3%)

Source: IPUMS, 2023 1-year U.S. Census ACS.

*The color orange is used for occupations that are present in both columns.

TAKEAWAYS

Hispanic construction employment continued to rise into 2023, outpacing the growth in non-Hispanic construction workers. The fact that states with high percentages of Hispanic workers, such as California and Texas, also have high fatality rates suggests a need to address potential gaps in safety resources and outreach for prevention efforts.

Monitoring the roles and distribution of Hispanic workers in construction, as well as differences in injuries and occupational hazards, is important because the proportion of Hispanic workers continues to increase. The following two chapters take a deeper look at this population.

RELATED CPWR PRODUCTS

- CPWR–The Center for Construction Research and Training. [2025]. Hispanic Employment and Demographics. [dashboard]. www.cpwr.com/research/data-center/construction-chart-book/interactive-7th/employment-income/.
 - This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by year.

- CPWR–The Center for Construction Research and Training. n.d.. Lista de recursos en español. www.cpwrr.com/spanish-language-resources/.
- Trueblood, A.B., Dufoe, D., Brooks, R.D., & Harris, W., [2024]. Hispanic Construction Workers: Employment, Business Owner, and Injury Trends. www.cpwrr.com/wp-content/uploads/DataBulletin-December2024.pdf.

DEFINITIONS

- **Ethnicity** – Separate from race, ethnicity is defined based on a respondent's self-reported Hispanic origin.
 - **Detailed ethnicity** – The subcategory of ethnicity that refers to a specific country or Spanish culture of origin.
- **Hispanic** – Refers to a person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, including people who reported detailed Hispanic or Latino groups, regardless of race.
- **Occupation** – The respondent's primary occupation coded according to the Census classification scheme. Specific occupation codes can be requested by emailing datacenter@cpwr.com.
- **Race** – A person's self-identification in one or more groups., including White, Black or African American, American Indian or Alaska Native, Asian and Native Hawaiian or Other Pacific Islander; other; or any combination of two or more categories.
- **Self-reported** – Reported by a survey-respondent based on how they identify.

DATA SOURCES AND NOTES

Steven Ruggles, Sarah Flood, Matthew Sobek, Daniel Backman, Annie Chen, Grace Cooper, Stephanie Richards, Renae Rodgers, and Megan Schouweiler. IPUMS USA: Version 15.0 [dataset]. Minneapolis, MN: IPUMS, 2024. doi.org/10.18128/D010.V15.0.

- In 2020 the questions used for determining Hispanic origin were changed, impacting comparability between pre- and post-2020 data. For more information: www.census.gov/programs-surveys/acs/technical-documentation/user-notes/2021-08.html.
- ACS data is not comparable to other estimates shown in products using Current Population Survey (CPS) data. ACS data is used due to a higher level of detailed demographic information compared to CPS.

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- U.S. Bureau of Labor Statistics (BLS). (2022, April). The construction industry: characteristics of the employed, 2003-20. www.bls.gov/spotlight/2022/the-construction-industry-labor-force-2003-to-2020/.
- U.S. Bureau of Labor Statistics (BLS). (2023, December). Number of fatal work injuries by state, map. www.bls.gov/charts/census-of-fatal-occupational-injuries/state-fatal-work-injuries-map.htm.

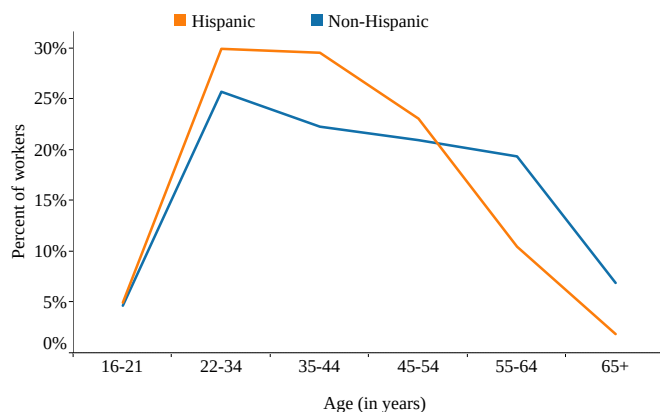
Demographics of Hispanic Construction Workers

As documented in the previous chapter, *Hispanic* construction employment is rapidly growing in the U.S., making it increasingly important to understand the characteristics of this group of workers. This chapter details key demographics of Hispanic *construction workers*, including age, sex, and *educational attainment*. This information also provides a baseline to compare to see if Hispanic workers are part of trends running across the industry, such as increases in women and aging workers (Harris et al., 2022). Monitoring changes in the demographics of the Hispanic workforce is especially important because they are predicted to have the fastest growth of any ethnic or racial group through 2028 (Torpey, 2019).

FINDINGS

The age distribution of construction workers was examined by *ethnicity* for 2022 (Chart 17a). Hispanic workers were younger on average than their non-Hispanic counterparts, with a higher percentage of Hispanic workers aged 22-34 years old (30.0% vs. 25.7%) and 35-44 years old (29.6% vs. 22.3%). Only 10.5% of Hispanic workers were 55-64 years old, compared to nearly twice that percentage (19.4%) of non-Hispanic workers. Workers in the older age categories are an increasing proportion of the labor force because workers are staying on the job longer. Growth rates have been larger than for young workers (Clark & Ritter, 2020).

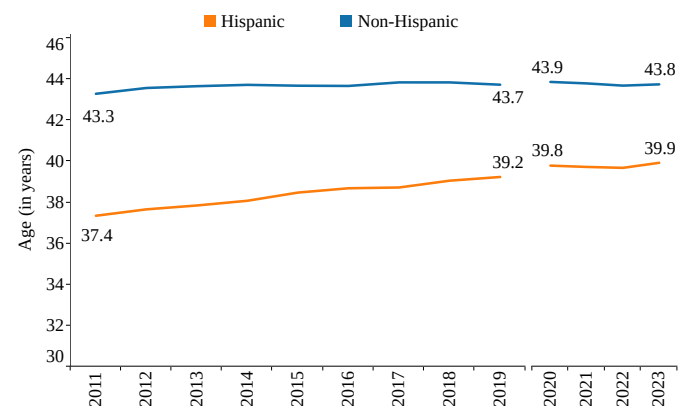
Chart 17a. Age distribution in construction, by Hispanic ethnicity (2023)



Source: IPUMS, 2023 1-year U.S. Census ACS.

In the U.S. labor force, the median age for Hispanic workers is several years younger than that of the entire worker population, and this holds true in construction as well (DOL, 2021). The average age of construction workers from 2011 to 2019 rose for both Hispanic (37.4 to 39.2 years old) and non-Hispanic (43.3 to 43.7 years old) workers; however, the increase was faster for Hispanic workers (Chart 17b). From 2020 to 2023, both worker groups saw slight decreases in average age, indicating either the entry of more younger workers, or the exit of some of the oldest workers in both groups.

Chart 17b. Average age of construction workers, by Hispanic ethnicity (2011-2023*)

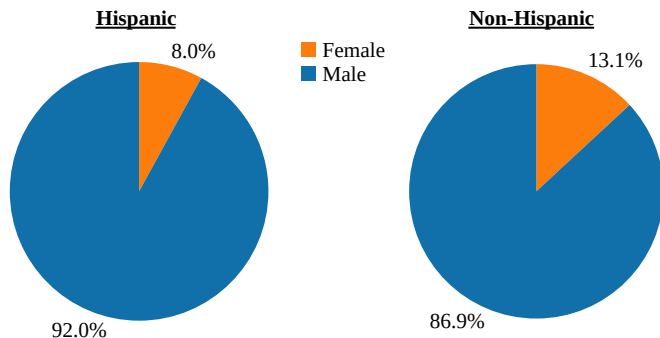


Source: IPUMS, 2011-2023 1-year U.S. Census ACS.

*In 2020 the questions used for determining Hispanic origin were changed, impacting comparability between pre- and post-2020 data.

Hispanic construction workers had a higher percentage of males than non-Hispanic workers (Chart 17c). This difference may be explained by a higher likelihood of Hispanic construction workers being in craftworker occupations than in office-based occupations, as the crafts have historically had low rates of female worker participation.

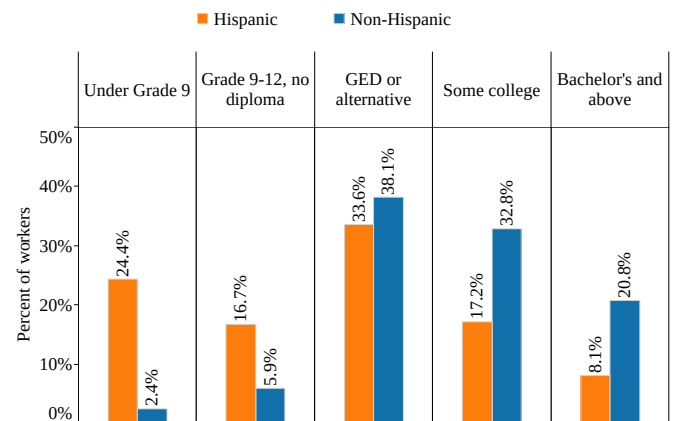
Chart 17c. Sex of construction workers, by Hispanic ethnicity (2023)



Source: IPUMS, 2023 1-year U.S. Census ACS.

Hispanic construction workers aged 25 years or older were more likely to have less than a high school education: in 2023, 41.1% had not received a high school diploma or equivalent, compared to 8.3% of non-Hispanic workers (Chart 17d). These rates of educational attainment are also lower than those of the U.S. Hispanic population overall, with only 24.7% of all Hispanic adults 25 or older not having received a high school diploma or equivalent in 2022 (U.S. Census Bureau, 2023).

Chart 17d. Educational attainment among construction workers aged 25 years or older, by Hispanic ethnicity (2023)



Source: IPUMS, 2023 1-year U.S. Census ACS.

TAKEAWAYS

In construction, Hispanic workers are younger than non-Hispanic workers on average. However, this difference in age has begun to close, with the average age of Hispanic workers climbing faster than that of non-Hispanics. Women were a smaller percent of Hispanic workers in construction and Hispanics had lower rates of educational attainment than their non-Hispanic counterparts. Due to the sizable and growing number of Hispanic workers in construction, it is important to monitor employment and demographics trends of these workers.

RELATED CPWR PRODUCTS

- CPWR—The Center for Construction Research and Training. [2025]. Construction Employment. [dashboard]. www.cpwr.com/research/data-center/construction-chart-book/interactive-7th/employment-income/.
- CPWR—The Center for Construction Research and Training. [2025]. Hispanic Employment and Demographics. [dashboard]. www.cpwr.com/research/data-center/construction-chart-book/interactive-7th/employment-income/.
 - This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by year.
- CPWR—The Center for Construction Research and Training. [n.d.]. Lista de recursos en español. www.cpwr.com/spanish-language-resources/.
- Trueblood, A.B., Dufoe, D., Brooks, R.D., & Harris, W. [2024]. Hispanic Construction Workers: Employment, Business Owner, and Injury Trends. www.cpwr.com/wp-content/uploads/DataBulletin-December2024.pdf.

DEFINITIONS

- **Construction worker** – A respondent who reported that they worked within the construction industry (NAICS 23) and that they were currently employed at time of survey.
- **Educational attainment** – Highest level of education received reported for those 25 years or older.
- **Ethnicity** – Separate from race, ethnicity is defined based on a respondent's self-reported Hispanic origin.
- **Hispanic** – Refers to a person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, including people who reported detailed Hispanic or Latino groups, regardless of race.

DATA SOURCES AND NOTES

Steven Ruggles, Sarah Flood, Matthew Sobek, Daniel Backman, Annie Chen, Grace Cooper, Stephanie Richards, Renae Rodgers, and Megan Schouweiler. IPUMS USA: Version 15.0 [dataset]. Minneapolis, MN: IPUMS, 2024. doi.org/10.18128/D010.V15.0.

- In 2020 the questions used for determining Hispanic origin were changed, impacting comparability between pre- and post-2020 data. For more information: www.census.gov/programs-surveys/acs/technical-documentation/user-notes/2021-08.html.
- ACS data is not comparable to other estimates shown in products using Current Population Survey (CPS) data. ACS data is used due to a higher level of detailed demographic information compared to CPS.

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Harris, W., Brown, S., Trueblood, A.B. (2022). Employment Trends and Projections in Construction. www.cpwr.com/wp-content/uploads/DataBulletin-March2022.pdf.

Torpey, E. (2019, October). Projected Employment Growth in Industries with Many Hispanics. www.bls.gov/careeroutlook/2019/data-on-display/hispanics.htm.

U.S. Census Bureau. (2023). Table 1. Educational Attainment of the Population 18 Years and Over, by Age, Sex, Race, and Hispanic Origin: 2022. www.census.gov/data/tables/2022/demo/educational-attainment/cps-detailed-tables.html.

U.S. Bureau of Labor Statistics (BLS). (2023). 7. Employment status of the civilian noninstitutional population 25 years and over by educational attainment, sex, race, and Hispanic or Latino ethnicity. www.bls.gov/cps/aa2022/cpsaat07.htm.

U.S. Department of Labor (DOL). (2021, September). Hispanics in the Labor Force: 5 Facts. blog.dol.gov/2021/09/15/hispanics-in-the-labor-force-5-facts.

Foreign-born Workers

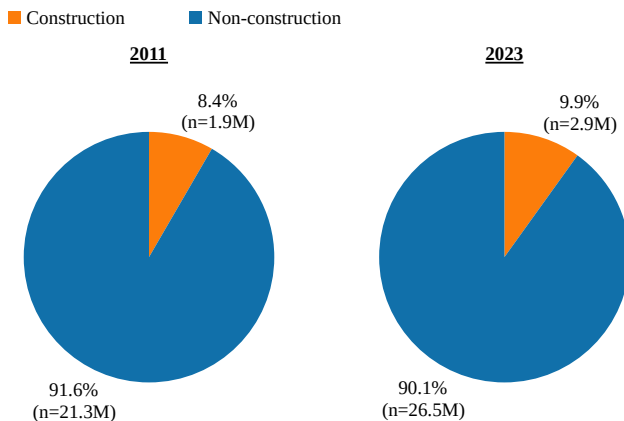
Foreign-born workers accounted for 19% of the U.S. civilian labor force in 2024 and were more likely to work in service, natural resources, construction, and maintenance occupations (BLS, 2024). In addition, Hispanics accounted for 49% of foreign-born workers in 2024.

Research has shown that the foreign-born work in more dangerous jobs than their native-born counterparts, with the U.S. Bureau of Labor Statistics reporting that foreign-born workers are overrepresented in fatal workplace injuries (Castillo, 2023; Zuehlke, 2009). This disproportionate danger helps explain the need to monitor this segment of the workforce. This chapter examines foreign-born workers in construction, with a focus on non-Hispanic workers, as Hispanic workers are further examined in Chapter 19.

FINDINGS

On average from 2011 to 2023, 9.3% of all foreign-born workers worked in construction, or an annual average of 2.4 million (M) workers (data not shown). During this period, the number of foreign-born workers increased 52.6% in construction (1.9M to 2.9M) and 24.4% in non-construction industries (21.3M to 26.5M; Chart 18a).

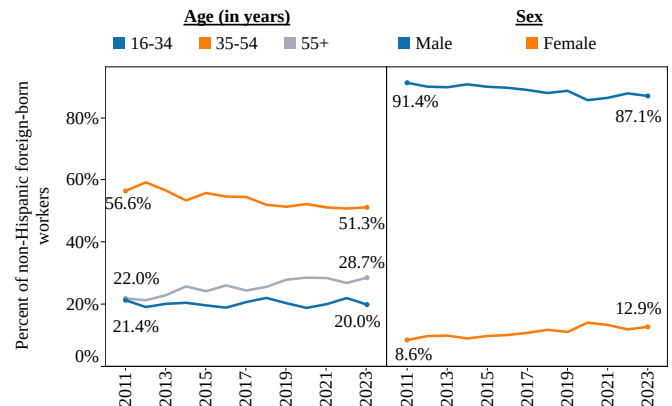
Chart 18a. Foreign-born workers, by industry (2011-2023)



Source: IPUMS, 2011 and 2023 1-year U.S. Census ACS.

Next, demographics of non-Hispanic foreign-born workers in construction were examined. In 2023, a majority of non-Hispanic foreign-born workers were 35 to 54 years old (51.3%) and male (87.1%) which is consistent with reported demographics of all foreign-born workers in the U.S. (Chart 18b; U.S. Bureau of Labor Statistics, 2024). From 2011 to 2023, there were increases among non-Hispanic foreign-born workers who were 55 years or older (+30.5%; 22.0% to 28.7%) and women (+50%; 8.6% to 12.9%).

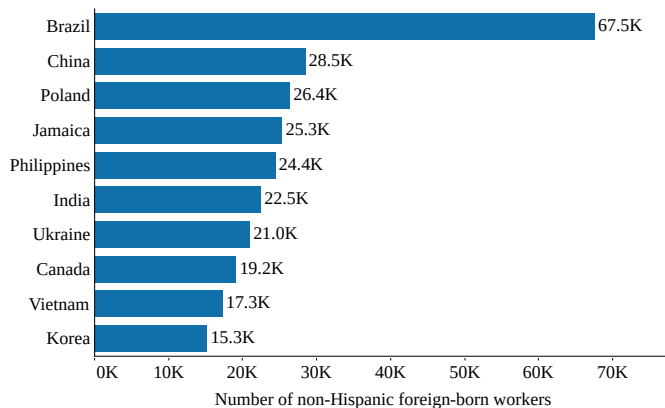
Chart 18b. Non-hispanic foreign-born workers in construction, by demographics (2011-2023)



Source: IPUMS, 2011-2023 1-year U.S. Census ACS.

The birthplace of non-Hispanic foreign-born construction workers was compiled (Chart 18c). The top three birthplaces were Brazil (n=67.5 thousand (K)), China (n=28.5K), and Poland (n=26.4K) in 2023. These birthplaces differ slightly than those reported from all immigrants in the U.S., which were India, China, and the Philippines (this list excludes Mexico since the chapter focuses on non-Hispanic foreign-born workers; Gramlich & Passel, 2024).

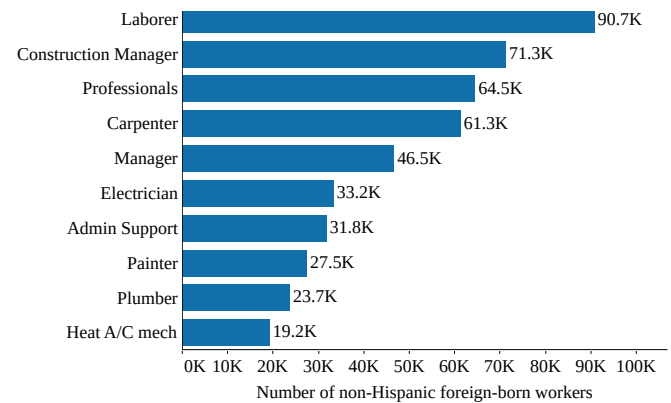
Chart 18c. Birthplace for non-Hispanic foreign-born construction workers (2023)



Source: IPUMS, 2023 1-year U.S. Census ACS.

The most common occupations among non-Hispanic foreign-born construction workers were laborers (n=90.7K) and construction managers (n=71.3K; Chart 18d). As shown in Chapter 29, projections indicate that laborers will be one of the fastest growing construction occupations from 2023 to 2033.

Chart 18d. Occupation for non-Hispanic foreign-born workers in construction (2023)



Source: IPUMS, 2023 1-year U.S. Census ACS.

TAKEAWAYS

From 2011 to 2023, the number of foreign-born construction workers rose 52.6%, with particularly large increases among non-Hispanic foreign-born workers who were 55 years or older and women. These demographic increases follow overall employment trends in construction, which has had disproportionate growth among workers who were 55 years or older and women (Harris et al., 2022). Given the increased risk of exposures and injuries among foreign-born and older workers, these trends may have important occupational safety implications and can be used to guide safety and health interventions (Castillo, 2023).

In addition, as labor shortages continue to impact the construction industry, changes and trends of foreign-born construction workers need to be monitored to determine how the workforce composition is changing, as well as to identify potential areas for worker recruitment and retention efforts.

RELATED CPWR PRODUCTS

- CPWR–The Center for Construction Research and Training. [2025]. Foreign-born Workers. [dashboard]. www.cpwr.com/research/data-center/construction-chart-book/interactive-7th/employment-income/.
 - This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by year.

DEFINITIONS

- Foreign-born workers** – Anyone who is not a U.S. citizen at birth. Anyone who was born in the United States, Puerto Rico, a U.S. Island Area (Guam, the Commonwealth of the Northern Mariana Islands, or the U.S. Virgin Islands), or abroad of a U.S. citizen parent or parents is native-born.

DATA SOURCES AND NOTES

Steven Ruggles, Sarah Flood, Matthew Sobek, Daniel Backman, Annie Chen, Grace Cooper, Stephanie Richards, Renae Rodgers, and Megan Schouweiler. IPUMS USA: Version 15.0 [dataset]. Minneapolis, MN: IPUMS, 2024.
doi.org/10.18128/D010.V15.0.

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Gramlich, J. & Passel, J.S. (2024, September 27). U.S. immigrant population in 2023 saw largest increase in more than 20 years. Pew Research Center. [pewrsr.ch/4eYwHYL](https://www.pewresearch.org/4eYwHYL).

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Hispanic Foreign-Born Construction Workers

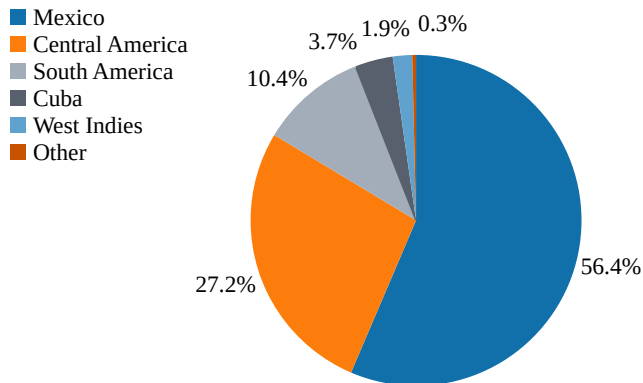
Foreign-born workers accounted for 19% of the U.S. civilian labor force, with *Hispanics* accounting for 49% of these workers in 2024 (BLS, 2025). In construction, the proportion of the workforce that are foreign-born can be much higher. In the Washington, DC-Baltimore area, for example, approximately 39% of the construction workforce were immigrants, double the percentage of the overall civilian labor force (George Mason University, n.d.). Nationally, the percentage of construction workers who are Hispanic is triple their percentage in the overall workforce, and over two-thirds of Hispanic construction workers are foreign-born.

Immigrants face significant challenges, including increased discrimination, financial vulnerability, psychological stress, and higher injury rates (IOM, 2021; Schumacher et al., 2023). In 2022, 28.9% of work-related fatalities in construction were among foreign-born workers, who accounted for 19.9% of the construction workforce (BLS, 2023; BLS, 2025; Ruggles et al., 2024). While this chapter does not address these concerns directly, it provides characteristics of these workers that can be used for intervention and prevention efforts, such as country of origin, time in the U.S., citizenship status, and English-speaking ability.

FINDINGS

In 2022, 56.4% of Hispanic foreign-born *construction workers* were born in Mexico (Chart 19a). This is consistent with 62.5% of Hispanic construction workers being *ethnically* Mexican as reported in Chapter 16: Hispanic Workers in Construction. The next most common place of birth—just over 25%—was Central America.

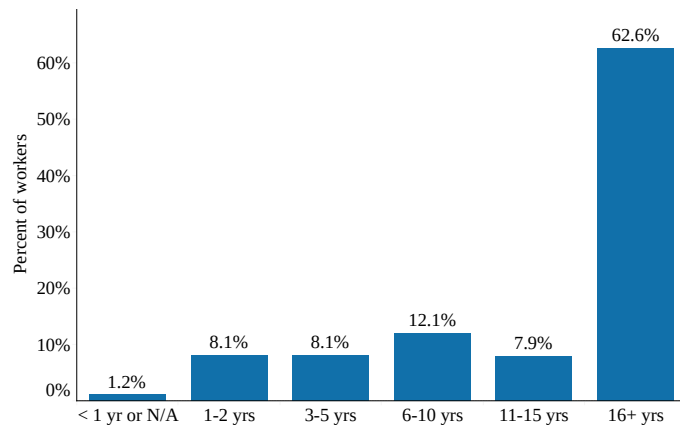
Chart 19a. Birthplaces of Hispanic foreign-born construction workers (2023)



Source: IPUMS, 2023 1-year U.S. Census ACS.

In 2023, over two out of every three Hispanic foreign-born workers in construction had lived in the U.S. for 11 or more years (Chart 19b), and only 1.2% had been in the country for less than a year. These numbers track closely with other work on foreign-born Hispanics, such as a 2023 survey that reported over three-fourths (77%) of immigrants had lived in the U.S. for 10 years or longer (Schumacher et al., 2023).

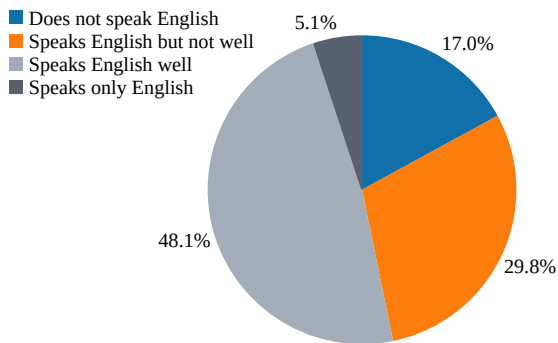
Chart 19b. Hispanic foreign-born workers, by years lived in the U.S. (2023)



Source: IPUMS, 2023 1-year U.S. Census ACS.

Next, English-speaking ability among Hispanic foreign-born construction workers was examined (Chart 19c). In 2023, only 17.0% of Hispanics foreign-born workers did not speak English, while 53.2% of these workers spoke English well or only spoke English. English proficiency increases as years in the U.S. increase, with 39% of Hispanic immigrants in the U.S. for more than 11 years reporting they are proficient (Haner & Lopez, 2023). Our findings reflect Hispanic foreign-born workers have been living in the U.S for an extended time, as shown in Chart 18b.

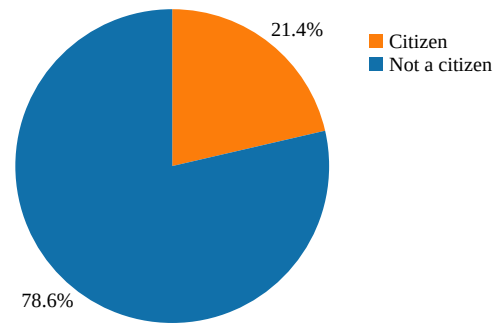
Chart 19c. English-speaking ability of Hispanic foreign-born workers (2023)



Source: IPUMS, 2011-2023 1-year U.S. Census ACS.

Citizenship status among Hispanic foreign-born workers was also analyzed (Chart 19d). Although three-quarters had lived in the U.S. for 11 or more years, less than a quarter (21.4%) of all Hispanic foreign-born workers had achieved citizenship in 2023, compared to 56% of all Hispanics in 2023 (KFF, 2024).

Chart 19d. Citizenship status among Hispanic foreign-born workers (2023)



Source: IPUMS 2011-2023 1-year U.S. Census ACS.

TAKEAWAYS

Hispanic foreign-born construction workers have, as a group, spent a lengthy amount of time living and working within the United States. A majority (83.5%) of them speak English, with more than half of them speaking English well or as an only language. Most of these workers (58.9%) were born in Mexico, while just over a quarter of workers were born in Central America.

Immigrant workers are more likely to experience occupational injuries, while also experiencing higher rates of not having health insurance; additionally 18% of lawfully present immigrants and 50% of likely undocumented immigrant adults report being uninsured, compared to 6% for naturalized citizens (IOM, 2021; KFF, 2023). Information on Hispanic foreign-born workers is imperative as this information can help guide intervention efforts to address disparities in injuries among these workers (Dong, 2018).

RELATED CPWR PRODUCTS

- CPWR—The Center for Construction Research and Training. [2025]. Construction Employment. [dashboard]. www.cpwr.com/research/data-center/construction-chart-book/interactive-7th/employment-income/.
- CPWR—The Center for Construction Research and Training. [2025]. Hispanic Employment and Demographics. [dashboard]. www.cpwr.com/research/data-center/construction-chart-book/interactive-7th/employment-income/.
- CPWR—The Center for Construction Research and Training. [2025]. Foreign-born Hispanic Workers. [dashboard]. www.cpwr.com/research/data-center/construction-chart-book/interactive-7th/employment-income/.
 - This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by year.
- CPWR—The Center for Construction Research and Training. [n.d.]. Lista de recursos en español. www.cpwr.com/spanish-language-resources/.

- Trueblood, A.B., Dufoe, D., Brooks, R.D., & Harris, W. [2024]. Hispanic Construction Workers: Employment, Business Owner, and Injury Trends. www.cpwrr.com/wp-content/uploads/DataBulletin-December2024.pdf.

DEFINITIONS

- **Construction worker** – A respondent who reported that they worked within the construction industry (NAICS 23) and that they were currently employed at time of survey.
- **Ethnicity** – Separate from race, ethnicity is defined based on a respondent's self-reported Hispanic origin.
- **Hispanic** – Refers to a person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, including people who reported detailed Hispanic or Latino groups, regardless of race.
- **Foreign-born** – Anyone who is not a U.S. citizen at birth. Anyone who was born in the United States, Puerto Rico, a U.S. Island Area (Guam, the Commonwealth of the Northern Mariana Islands, or the U.S. Virgin Islands), or abroad of a U.S. citizen parent or parents is native-born.

DATA SOURCES AND NOTES

Steven Ruggles, Sarah Flood, Matthew Sobek, Daniel Backman, Annie Chen, Grace Cooper, Stephanie Richards, Renae Rodgers, and Megan Schouweiler. IPUMS USA: Version 15.0 [dataset]. Minneapolis, MN: IPUMS, 2024. doi.org/10.18128/D010.V15.0.

- In 2020 the questions used for determining Hispanic origin were changed, impacting comparability between pre- and post-2020 data. For more information: www.census.gov/programs-surveys/acs/technical-documentation/user-notes/2021-08.html.

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Minority Workers in Construction

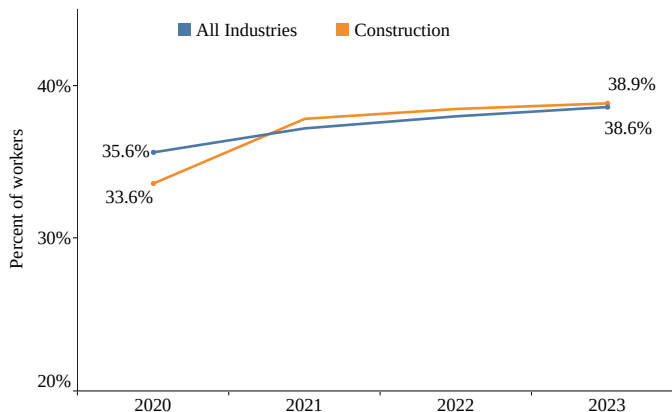
Construction workers are disproportionately likely to suffer a fatal injury: they account for about 8% of the workforce but 20% of on-the-job deaths (Trueblood et al., 2024). For *minority* construction workers, the odds of a reported nonfatal work-related injury were 70% higher than white, non-Hispanic construction workers (Brown et al., 2021). Minority workers were also found to have lower *educational attainment*, higher rates of being uninsured, and lower income which increased the likelihood of these injuries (Brown et al., 2021).

This chapter examines minority workers, defined as those who are non-white regardless of ethnicity, including an examination of their demographics and characteristics. The American Community Survey (ACS), the source of this data, revised its race and ethnicity questions in 2019; therefore, data in this chapter are not comparable with minority data in previous editions of the Chart Book (IPUMS USA, n.d.). Race definitions also vary by data source (see chart notes below). For information on Hispanic construction workers, see Chapters 16, 17, 18, and 19.

FINDINGS

In 2023, approximately 39% of workers both in construction and all industries were minorities (Chart 20a). Since 2020, the percentage of workers who were minorities increased almost twice as fast in construction (+15.8%; 33.6% to 38.9%) than all industries (+8.4%; 35.6% to 38.6%).

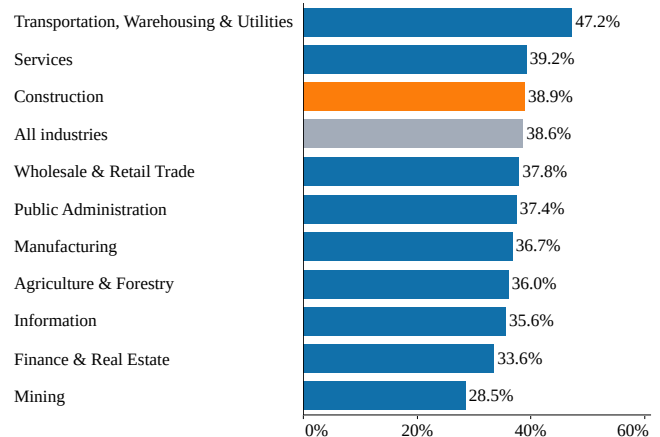
Chart 20a. Percent of minority workers, construction versus all industries (2020-2023)



Source: IPUMS, 2020-2023 1-year U.S. Census ACS.

Minority workers by industry were examined next (Chart 20b). In 2023, construction (38.9%) had the third highest percentage of minority workers, after transportation, warehousing, and utilities (47.2%) and services (39.2%). All three industries had higher percentages of minorities than all industries (38.6%; shown in Chart 20a).

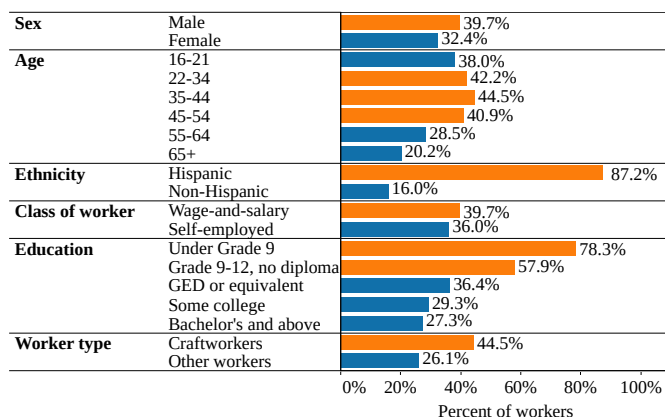
Chart 20b. Percent of minority workers, by industry (2023)



Source: IPUMS, 2020-2023 1-year U.S. Census ACS.

Selected demographics and characteristics of construction workers in 2023 were examined by percentages of minority workers (Chart 20c). By sex, 39.7% of male construction workers were minority, compared to 32.4% of female construction workers. By age, workers 35 to 44 years old had the highest percentage of minority workers (44.5%). Hispanic workers were 5.5 times as likely to be minority compared to non-Hispanic workers (87.2% versus 16.0%). *Wage-and-salary* workers had a slightly higher percentage of minority workers compared to *self-employed* (39.7% versus 36.0%). By educational attainment, 78.3% of workers completing grade 9 or less were a minority. By *worker type*, 44.5% of *craftworkers* in construction were found to be a minorities.

Chart 20c. Racial minorities as a percentage of construction workers, by selected characteristics (2023)*

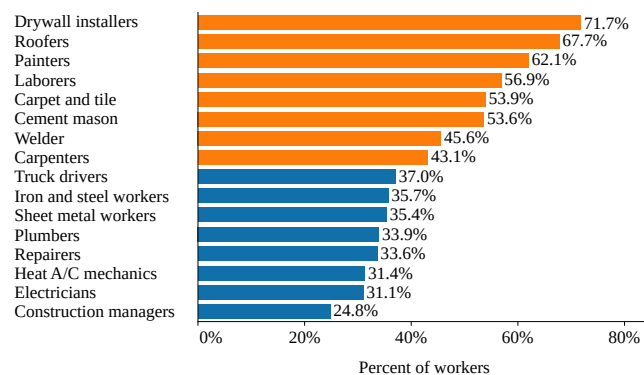


Source: IPUMS, 2020-2023 1-year U.S. Census ACS.

*Orange bars indicate characteristics with a higher percentage of minority workers compared to all construction (38.9%).

Occupations varied by the percentage of minority workers (Chart 20d). Seven of the occupations examined in 2023 had higher percentages of minority workers than the construction average (38.9%), including drywall installers (71.7%), roofers (67.7%), painters (62.1%), laborers (56.9%), carpet and tile installers (53.9%), cement masons (53.6%), welders (45.6%), and carpenters (43.1%). The lowest percentage of minority workers was among construction managers (24.8%).

Chart 20d. Minorities as a percentage of workers, by selected construction occupations (2023)*



Source: IPUMS, 2020-2023 1-year U.S. Census ACS.

*Orange bars indicate characteristics with a higher percentage of minority workers compared to all construction (38.9%).

TAKEAWAYS

Two out of five construction workers was a minority in 2023, the third highest percentage of any industry. This percentage has been increasing recently. Minority workers had lower educational attainment levels than non-minority workers. Almost half of craftworkers (44.5%) were minorities, and occupations with the highest percentage of minority workers were drywall installers (71.7%), roofers (67.7%), and painters (62.1%).

The minority population in the U.S. are expected to become a majority of the population by 2045 (Frey, 2018). In addition, as the construction industry continues to grow and have a high number and rate of injuries, it is important to monitor minority worker trends due to the higher risk of injuries among these workers.

RELATED CPWR PRODUCTS

- CPWR—The Center for Construction Research and Training. [2025]. Minority Construction Workers. [dashboard]. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/employment-income/.
 - This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by year.

DEFINITIONS

- **Educational attainment** – The highest grade of school completed, or the highest degree completed.
- **Minority** – All race categories that were not white.
- **Self-employed** – Includes unincorporated and incorporated workers.
- **Wage-and-salary** – Individuals who receive wages, salaries, commissions, tips or payment in kind from their employer.
- **Worker type** – Indicates the type of work being performed.
 - **Craftworkers** – All workers except those who are managerial, professional, or administrative support. Also called blue-collar or production workers.
 - **Other workers** – Includes managerial, professional, and administrative support workers. Also called white-collar workers.

DATA SOURCES AND NOTES

Steven Ruggles, Sarah Flood, Matthew Sobek, Daniel Backman, Annie Chen, Grace Cooper, Stephanie Richards, Renae Rodgers, and Megan Schouweiler. IPUMS USA: Version 15.0 [dataset]. Minneapolis, MN: IPUMS, 2024. doi.org/10.18128/D010.V15.0.

- Historical data was not examined due to a [data definition change](#) in 2020.
- Due to differences in data collection Hispanic workers are not coded as white in ACS data, while they are typically coded as white in CPS.

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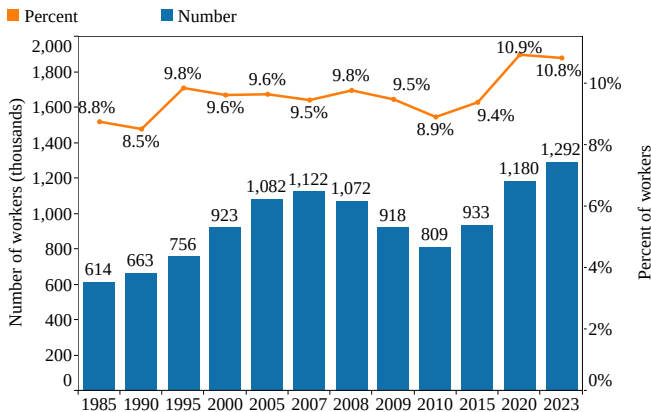
Women in Construction

Women are underrepresented in many infrastructure-related industries, such as construction, manufacturing, and clean energy (Shaw, 2023). These industries currently have high demand for additional workers, partially to fulfill federally funded projects: for example, estimates in 2024 indicated construction was short over half a million workers (Associated Builders and Contractors, 2024). This kind of employment need indicates the importance of a diverse workforce and of understanding trends of growing employment populations, including women, Hispanic, and aging workers (55 years or older; Harris et al., 2022).

FINDINGS

Women accounted for 10.8% of the construction workforce in 2023, an increase of 2 percentage points since 1985 (Chart 21a). The number of women in construction has doubled over the last 40 years: there were 614,100 *women workers* in 1985, 1.3 Million (M) in 2023. During the *Great Recession* from 2007 to 2011, construction employment for all workers declined 23.5% (11.9M to 9.1M), with women's employment declining even more sharply, 26.5% (1.1M to 809 thousand (K)). There were additional, smaller declines throughout 2012 (McAnaw Gallagher, 2022). By 2019, the number of women in construction surpassed pre-Great Recession numbers, reaching 1.2M. From 2019 to 2020, the number of women in construction stayed almost the same (an 0.5% increase), and following the COVID-19 pandemic, employment grew 4.0% from 2021 to 2023 (data not shown).

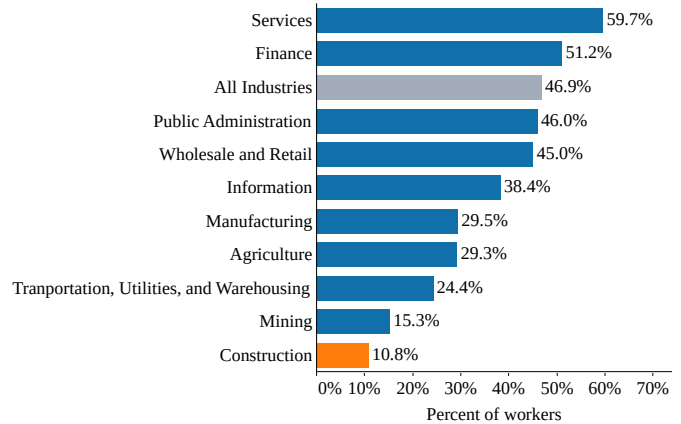
Chart 21a. Women workers in construction, selected years (2000-2023)



Source: IPUMS, 1985-2023 Current Population Survey.

Despite overall growth, women continue to be dramatically underrepresented in construction, accounting for just over 1 in 10 workers (10.8%) in 2023. In comparison, 46.9% of workers across all industries were women (Chart 21b). Service industries had the highest percentage of women workers, at 59.7% in 2023.

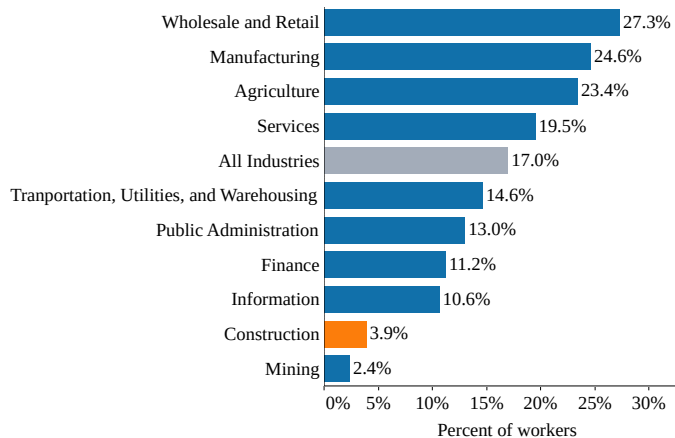
Chart 21b. Women as a percentage of all workers, by industry (2023)



Source: IPUMS, 2023 Current Population Survey.

The proportion of women among *craftworkers* was even smaller, indicating that in construction, women were largely in administrative and support jobs (U.S. Department of Commerce, n.d.). In 2023, only 3.9% of craftworkers construction were women compared to 16.9% of craftworkers in all industries (Chart 21c).

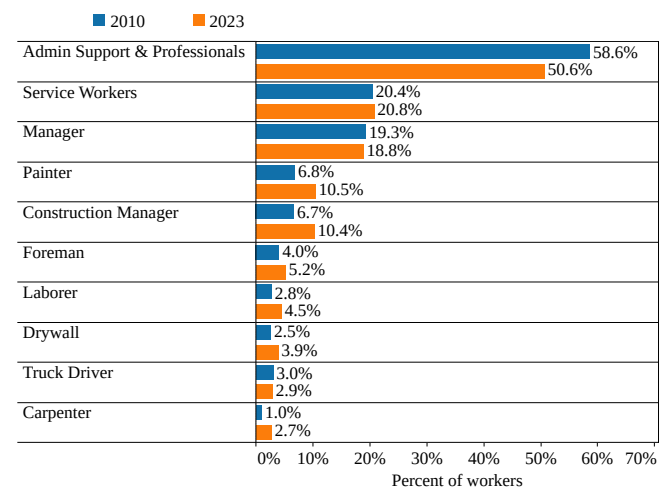
Chart 21c. Women as a percentage of craftworkers, by industry (2023)



Source: IPUMS, 2023 Current Population Survey.

Among selected occupations in 2023, administrative support and professionals had the highest percentage of women workers at 50.6%, while the lowest percentage was among carpenters (2.7%; Chart 21d). This finding further documents gender disparities among construction occupations. The percentage of women workers in administrative support and professionals decreased 13.7% from 2010 to 2023 (58.6% to 50.6%), while the largest percentage growth was among carpenters, up 170.0% from 1.0% to 2.7%. The percentage of women workers increased in almost all occupations examined from 2010 to 2023, with the exception of administrative support and managers, which saw decreases.

Chart 21d. Women workers in select construction occupations (2010 and 2023)



Source: IPUMS, 2010 and 2023 Current Population Survey.

TAKEAWAYS

Gender disparities continue in certain industries and occupations, including in construction (Garcia & Smith Vanek, 2019). To close the gender gap in employment, several recent federal efforts have been implemented, including expansion of the *registered apprenticeship programs*, the *Million Women in Construction Initiative*, and efforts to address pay inequalities and occupational segregation (The White House, 2024).

While the number of women in construction continue to increase, they are still significantly underrepresented. Additional barriers to joining and staying in the construction workforce should be the focus of future efforts to address ongoing labor shortages impacting the industry, including discrimination, harassment, and limited services like childcare that disproportionately impact women (U.S. Department of Commerce, n.d.).

RELATED CPWR PRODUCTS

- CPWR–The Center for Construction Research and Training. [2025]. Women in Construction. [dashboard]. cpwr.com/research/data-center/construction-chart-book/interactive-7th/employment-income/.
 - This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by year.

- CPWR–The Center for Construction Research and Training. [2023]. Women in Construction: Employment, Business Owner, and Injury Trends. www.cpwrr.com/wp-content/uploads/DataBulletin-May2023.pdf.
- CPWR–The Center for Construction Research and Training. [n.d.]. Women in the Trades. [r2p Resources]. www.cpwrr.com/research/research-to-practice-r2p/r2p-partnerships/r2p-p2r-at-work-reaching-vulnerable-workers/women-in-the-trades/.

DEFINITIONS

- **Craftworkers** – All workers except those who are managerial, professional, or administrative support. Can be interchanged with blue-collar or production workers.
- **Great Recession** – Period from 2007 to 2010 during which there was a decline in the global economy.
- **Million Women in Construction Initiative** – Department of Commerce efforts to double the number of women in construction from 1 million in 2022 to 2 million in 2032.
- **Registered apprenticeship program** – A career pathway where employers develop and prepare their future workforce through training and paid work experience.
- **Women workers** – Construction workers who reported their sex as female.

DATA SOURCES AND NOTES

Sarah Flood, Miriam King, Renae Rodgers, Steven Ruggles, J. Robert Warren, and Michael Westberry. Integrated Public Use Microdata Series, 1985–2023 Current Population Survey: Version 9.0 [dataset]. Minneapolis, MN: IPUMS, 2024. doi.org/10.18128/D030.V9.0.

- The data was weighted using the final basic weight and not composite weight for replicating U.S. Bureau of Labor Statistics (BLS); thus, estimates presented are not directly comparable to estimates published by the BLS.

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Temporary Workers

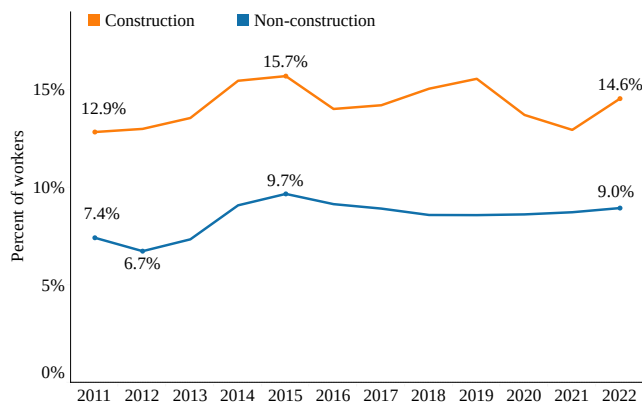
The proportion of U.S. workers classified as temporary has increased over the past two decades. This growth has resulted from efforts to meet fluctuating labor force demands (Menger-Ogle et al., 2022), as well as rises in *gig* and other nonstandard work arrangements (GOA, n.d.). Though temporary work arrangements have grown only recently in the overall U.S. economy, they have long been commonplace in the construction industry (CPWR, 2015).

Monitoring the use of *temporary workers* in construction is particularly important because these workers may have a higher risk of injuries than their non-temporary counterparts (CDC, 2022). In addition, they may also face higher job instability, lower wages and fewer benefits than regular employees (GOA, 2023, NELP, 2019).

FINDINGS

From 2011 to 2022, an average of 14.3% of construction workers were temporary (Chart 22a). During this period, construction had a higher percentage of temporary workers than the economy overall. The proportion of temporary workers grew faster in non-construction compared to construction from 2011 to 2022 (+21.6% versus +13.2%, respectively). This rapid increase in the overall economy may be due in part to the rise in *gig* economy work (GOA, n.d.) as well as employers' ability and need to adapt to fluctuating demand for labor (Menger-Ogle et al., 2022).

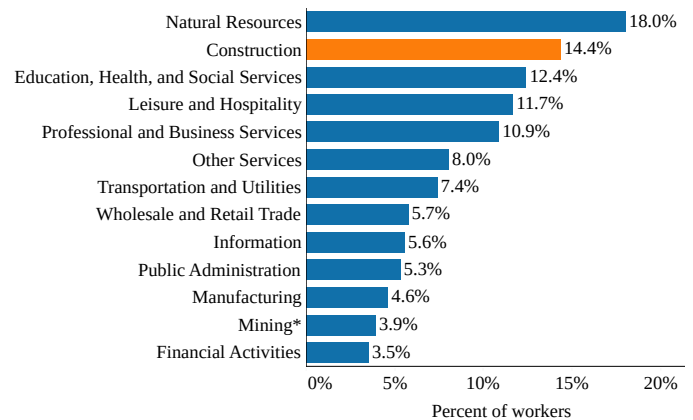
Chart 22a. Temporary workers, by industry and years (2011-2022)



Source: Agency for Healthcare Research and Quality. 2016-2022 Medical Expenditure Panel Survey.

When looking at temporary workers by industry from 2016 to 2022, natural resources (18.0%) had the highest percentage of temporary workers and construction (14.4%) had the second highest level (Chart 22b). These figures are consistent with a prior U.S. Bureau of Labor Statistics (BLS) report, which found construction workers were among those most likely to have contingent, on-call, or contract work arrangements (BLS, 2024).

Chart 22b. Temporary workers in selected industries (average 2016-2022)

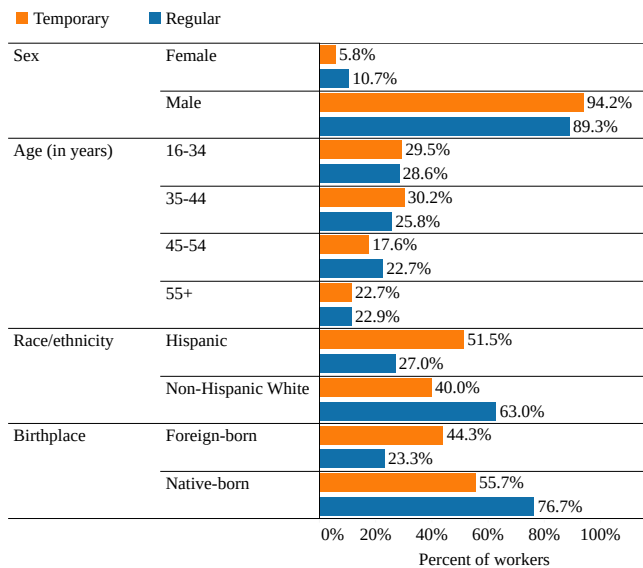


Source: Agency for Healthcare Research and Quality. 2016-2022 Medical Expenditure Panel Survey.

*Sample size <30 for temporary workers interpret with caution.

Next, demographic differences between temporary and regular construction workers were examined. On average from 2016 to 2022, most temporary construction workers were *Hispanic* (51.5%), under 44 years old (59.8%), male (94.2%), and native-born (55.7%; Chart 22c). These findings are consistent with BLS studies, which reported that across all industries, Hispanics and younger workers were more likely to have temporary or contingent work arrangements (BLS, 2024). Temporary work arrangements were more prevalent among males than females in construction, which was also observed in the overall workforce (BLS, 2024).

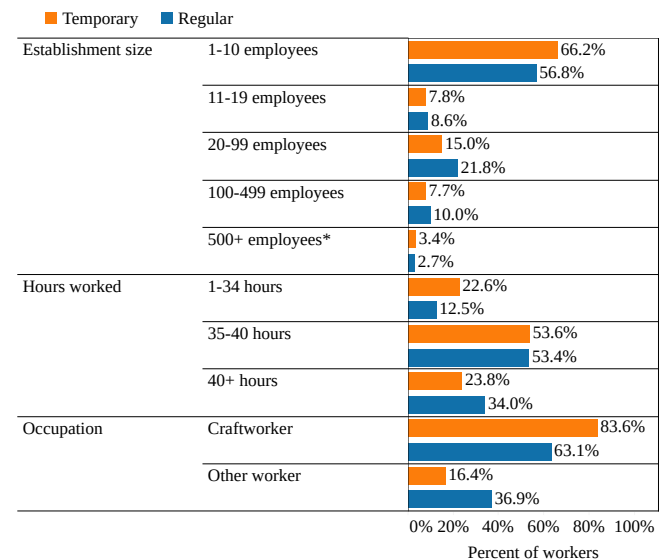
Chart 22c. Demographic characteristics of construction workers, temporary versus regular employment (average 2016-2022)



Source: Agency for Healthcare Research and Quality. 2016-2022 Medical Expenditure Panel Survey.

Employment characteristics of temporary construction workers differed from those with regular work arrangements (Chart 22d). On average from 2016 to 2022, temporary workers were more likely to work in establishments with 10 or fewer employees (66.2% versus 56.8%). In addition, *craftworkers* and part-time (less than 35 hours a week) construction workers were more likely to have temporary work arrangements during this period, a finding also observed among all workers (BLS, 2024).

Chart 22d. Employment characteristics of construction workers, temporary versus regular employment (average 2016-2022)



Source: Agency for Healthcare Research and Quality. 2016-2022 Medical Expenditure Panel Survey.

*Sample size <30 for temporary workers interpret with caution.

TAKEAWAYS

From 2011 to 2022, there was a 13.2% increase in the proportion of temporary workers in construction. When compared to regular employees, temporary workers were more likely to be Hispanic, foreign-born, under 45 years of age, and craftworkers; they also worked for smaller establishments with ten or fewer employees.

While temporary work arrangements make it easier for employers to meet changing labor needs while avoiding costs associated with employing regular employees, such arrangements can have adverse effects on the temporary workers, including increased job instability, lower wages, fewer benefits, and increased vulnerability to workplace injuries (Menger-Ogle et al., 2022, NELP, 2019). For these reasons, it remains important to monitor temporary worker trends as well as risk factors associated with temporary work in construction, as this information can be used to guide safety and health interventions that help keep these workers safe.

RELATED CPWR PRODUCTS

- CPWR—The Center for Construction Research and Training. [2025]. Temporary Workers. [dashboard]. cpwr.com/research/data-center/construction-chart-book/interactive-7th/employment-income/.
 - This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by year.

DEFINITIONS

- **Birthplace** – Indicates if the worker was born within or outside of the U.S.
 - **Foreign-born** – Those who were born outside of the U.S.
 - **Native-born** – Those born in the U.S. or those born abroad to U.S. parents.
- **Craftworkers** – All workers, except managerial, professional (architects, accountants, lawyers, etc.), and administrative support workers. Also called blue-collar or production workers.
- **Establishment size** – The number of employees working for an establishment reported in the mid-March pay period.
- **Ethnicity** – Whether a person is of Hispanic, Latino, or Spanish origin.
 - **Hispanic** – Refers to a person of Hispanic, Latino, or Spanish origin, regardless of race.
- **Gig** – Job when income is earned through on-demand work, services, or goods. (e.g., ridesharing, ondemand labor).
- **Other workers** – Includes managerial, professional, and administrative support workers. Also called white-collar workers.
- **Race** – Respondents reported race (e.g., racial, national origin, or sociocultural groups). Respondents could select more than one race.
- **Temporary workers** – Respondents who answered “yes” to either of the two questions: “Is your current main job a temporary job?” or “Is your current main job a seasonal job?”. Temporary workers could be full-time or part-time workers.

DATA SOURCES AND NOTES

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- In 2020 the questions used for determining Hispanic origin were changed, impacting comparability between pre- and post-2020 data. For more information: www.census.gov/programs-surveys/acs/technical-documentation/user-notes/2021-08.html.

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Self-Employed Workers

Self-employed workers, also known as independent contractors, operate either as an *incorporated* or an *unincorporated* business (U.S. Census Bureau, 2024). Over the years, a majority of those self-employed workers, either in construction or all industries combined, have been unincorporated (CPWR 2018; U.S. Census Bureau, 2024). Construction has had a higher proportion of self-employed workers than all nonfarm industries, which has often been attributed to the nature of construction jobs and projects (Woods, 2020).

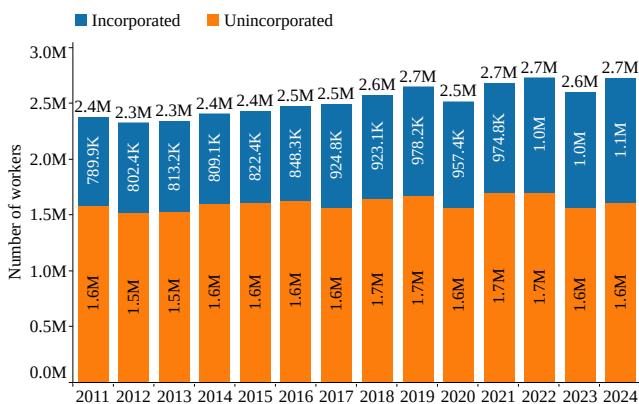
Another important contributor to this figure has been employee *misclassification* as independent contractors (GOA, 2009; Carré et al., 2005; Gutierrez et al., 2023). One factor that is likely to impact unincorporated self-employment in construction is the updated Department of Labor's (DOL) 2024 Final Rule, which aims to reduce misclassification of employees as independent contractors. This rule provides a method for determining the status of employees and independent contractors that is more in line with the Fair Labor and Standards Act (U.S. DOL, n.d.).

It is vital to monitor trends among self-employed workers because they do not have the same safety and health protections as their wage-and-salary counterparts, such as OSHA requirements. They are also at a greater risk of job loss if they suffer a work-related injury.

FINDINGS

The number of self-employed construction workers increased 12.5%, from 2.4 million (M) to 2.7M (Chart 23a), between 2011 and 2024. While this number trended upward from 2012 to 2019, it decreased slightly in 2020 before increasing again in 2021 and 2022. The fluctuations from 2020 to 2022 most likely resulted from the economic uncertainty experienced during the COVID-19 pandemic (Cai et al., 2023). Of self-employed construction workers, 63.7% were unincorporated from 2011 to 2024. In 2024, that percentage was slightly lower, 59.3% (n=1.6M).

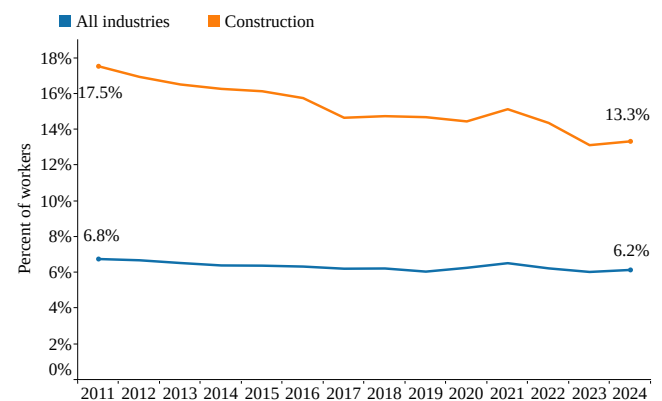
Chart 23a. Number of self-employed workers in construction, by incorporation status (2011-2024)



Source: IPUMS, 2011-2024 Current Population Survey.

Next, the proportion of unincorporated self-employed workers in the workforce were examined (Chart 23b). In 2024, the proportion of the self-employed who were unincorporated was twice as high in construction (13.3%) than in all industries (6.2%). Although from 2011 to 2024, construction always had a higher percentage of unincorporated self-employed workers, the proportion of unincorporated among the self-employed declined more rapidly in construction (-24.0%) than all industries (8.8%). This finding is consistent with that of the Small Business and Entrepreneurship Council, which reported a downward trend in self-employment overall in the U.S. in recent years (Small Business and Entrepreneurship Council, n.d.).

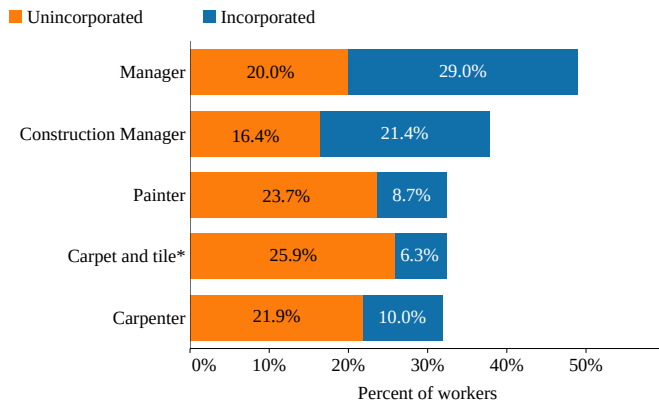
Chart 23b. Unincorporated self-employment as a percentage of the workforce, construction versus all nonfarm industries (2011-2024)



Source: IPUMS, 2011-2024 Current Population Survey.

Within construction, self-employment varied by *occupation* (Chart 23c). In 2024, self-employment was highest among managers (49.0%). Proportions were also higher than average among construction managers (37.8%), painters (32.4%), carpet and tile workers (32.2%), and carpenters (31.9%) construction (Chart 23d).

Chart 23c. Occupations with the highest proportion of self-employed workers, by incorporation status (2024)

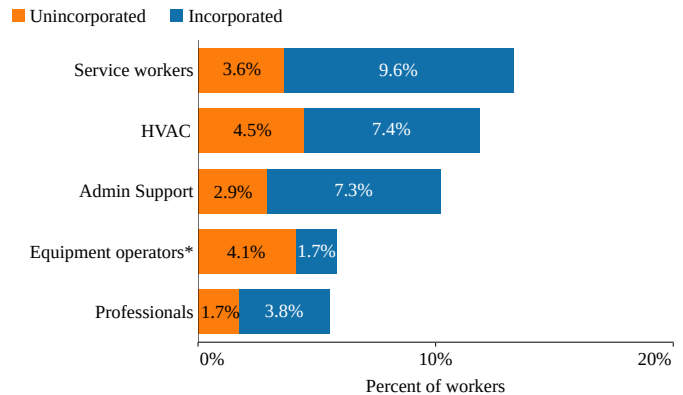


Source: IPUMS, 2024 Current Population Survey.

*Incorporated n<30 interpret with caution.

Professionals (5.5%), construction equipment operators (5.8%), administrative support professionals (10.2%), HVAC workers (11.9%), and service workers (13.2%) had the lowest proportions of self-employed workers in construction (Chart 23d).

Chart 23d. Occupations with the lowest proportion of self-employed workers, by incorporation status (2024)



Source: IPUMS, 2024 Current Population Survey.

*Incorporated n<30 interpret with caution.

TAKEAWAYS

It remains important to monitor self-employment trends in the construction industry, where the proportion of independent contractors is higher than in most other industries. This proportion may be artificially inflated, however, as misclassification of employees as independent contractors is relatively common in construction (GOA, 2009, Carré et al., 2005, Gutierrez et al., 2023). Misclassification can be beneficial to employers, as they can save on taxes, benefits, and other expenses (e.g., unemployment insurance, workers' compensation; GOA, 2009, Gutierrez et al., 2023). While it can provide advantages to workers, as independent contractors have more control and flexibility over their schedules and on when they pay taxes, it can also have serious detriments (GOA, 2009).

Unincorporated, self-employed workers have a greater likelihood of being misclassified, at which point they have fewer protections from unfair wages, lack of overtime payment, as well as access to workers' compensation and unemployment insurance. The updated DOL's 2024 Final Rule will likely have an impact on unincorporated self-employment in construction in the future.

RELATED CPWR PRODUCTS

- CPWR—The Center for Construction Research and Training. [2025]. Self-employed Workers. [dashboard]. cpwr.com/research/data-center/construction-chart-book/interactive-7th/employment-income/.
 - This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by year.

DEFINITIONS

- Incorporation status** – Indicates if a self-employed individual worked for an incorporated business.
 - Incorporated** – Includes those whose business was incorporated. These workers are typically included with private wage-and-salary workers because they are paid employees of their own companies.
 - Unincorporated** – Includes those who worked for profit or fees in their own unincorporated business, profession, or trade. Refers to those who work for themselves, such as independent contractors, independent consultants, and freelance workers. Most often they do not have paid employees.

- **Misclassification** – Classifying workers as self-employed, when they are not.
- **Occupation** – The primary occupation of the respondent with the most hours worked during the preceding week if employed. Email datacenter@cpwr.com for specific codes used for each occupation.
- **Self-employed** – An individual who works for themselves and not an employer, can be incorporated or unincorporated.

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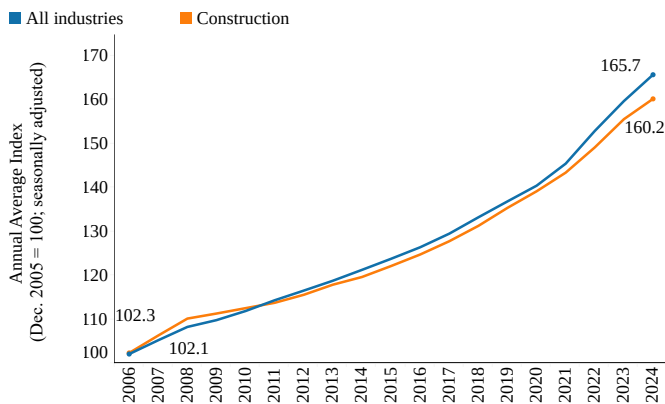
Employment Costs

Monitoring employment costs can provide workers and employers with information on the labor market and the economic environment (BLS, n.d.). These costs, which often vary across industries and occupation, include benefits as well as wages and salaries. It is important to examine these components separately to determine if changes in employment costs are due to wage increases or rising benefit costs. This chapter examines employment costs in construction compared to other industries, as well as by expense type.

FINDINGS

From 2006 to 2024, the *Employment Cost Index (ECI)*, which measures the changes in costs of labor, increased 62.3% for all industries (102.1 to 165.7) and 56.6% for construction (102.3 to 160.2; Chart 24a). From 2006 to 2010, the ECI for construction was slightly higher than for all industries, but since then it has been slightly lower. In 2024, the ECI was 160.2 in construction and 165.7 for all industries.

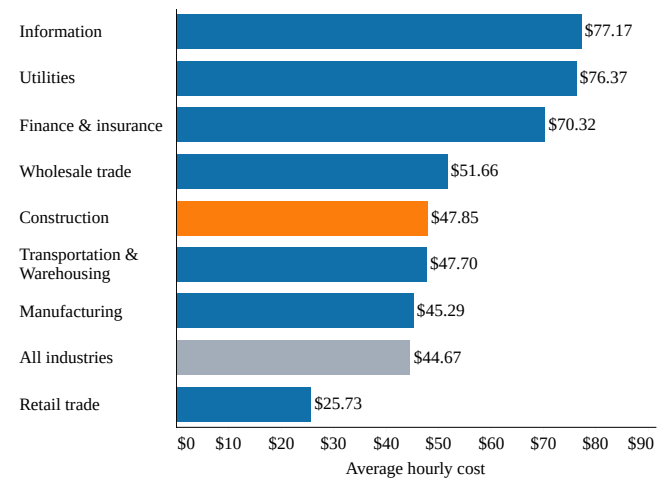
Chart 24a. Index of labor costs, by industry (2006-2024; Seasonally adjusted, private industry)



Source: U.S. Bureau of Labor Statistics, 2011-2024 Employment Cost Index.

Next, average hourly total compensation, including *wage and salary* and *benefits*, was explored. The highest compensation in 2024 was for the information industry, \$77.17, which was 1.6 times higher than construction, \$47.85 (Chart 24b). However, construction had a slightly higher total hourly compensation than all industries, \$47.85 versus \$44.67.

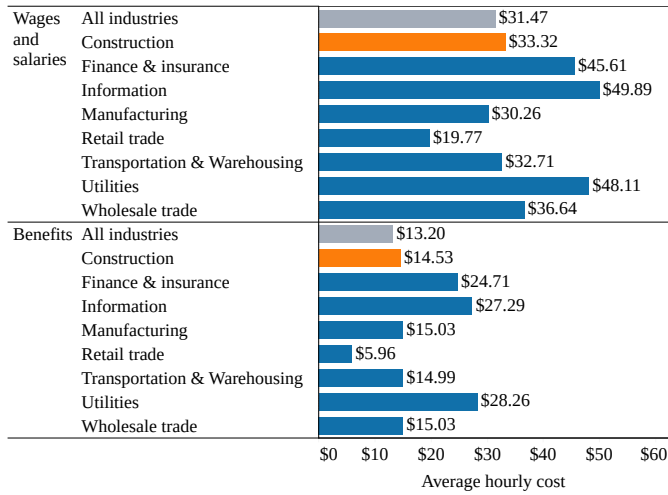
Chart 24b. Average hourly total compensation, by industry (December 2024, private industry)



Source: U.S. Bureau of Labor Statistics, 2024 Employer costs for employee compensation.

To understand differences in the elements of compensation, type of compensation was explored by industry (Chart 24c). In 2024, information had the highest average hourly rate for wage-and-salaries at \$49.89, compared to \$33.32 for construction. Wages are further examined in Chapter 25: Wages in Construction. In comparison, utilities had the highest average hourly rate for benefits at \$28.26, nearly double construction's \$14.53.

Chart 24c. Average hourly total compensation, by expense type and industry (December 2024, private industry)



Source: U.S. Bureau of Labor Statistics, 2024 Employer costs for employee compensation.

Average hourly total compensation costs for benefits were then examined (Chart 24d). By industry, construction had the second lowest average hourly total compensation for insurance (\$3.50 versus \$3.22 for all industries) and paid leave (\$2.32 versus \$3.38 for all industries). Construction had the fourth lowest average hourly total compensation for retirement and savings (\$2.11 versus \$1.52 for all industries) and supplemental pay (\$2.51 versus \$1.84 for all industries) expenses. In contrast, construction had the fourth highest average hourly total compensation for legally required benefits (\$4.09 versus \$3.24 for all industries). This larger amount results from higher workers' compensation and unemployment costs for the construction industry (CPWR, 2018).

Chart 24d. Average hourly total compensation for benefits, by industry (December 2024, private industry)

	Insurance	Legally required benefits	Paid leave	Retirement and savings	Supplemental pay
All industries	\$3.22	\$3.24	\$3.38	\$1.52	\$1.84
Construction	\$3.50	\$4.09	\$2.32	\$2.11	\$2.51
Finance & insurance	\$6.15	\$4.20	\$6.69	\$2.83	\$4.85
Information	\$6.76	\$4.88	\$7.96	\$3.64	\$4.05
Manufacturing	\$4.25	\$3.34	\$3.37	\$1.51	\$2.57
Retail trade	\$1.46	\$2.12	\$1.30	\$0.51	\$0.56
Transportation & Warehousing	\$4.07	\$3.79	\$3.24	\$2.23	\$1.66
Utilities	\$7.14	\$5.27	\$6.91	\$6.37	\$2.57
Wholesale trade	\$3.56	\$3.69	\$4.06	\$1.74	\$1.98

Source: U.S. Bureau of Labor Statistics, 2024 Employer costs for employee compensation.

TAKEAWAYS

Although the ECI for construction increased from 2006 to 2024, it fell below the figure for all industries in 2011 and has remained lower. Construction overall had a higher average hourly total compensation compared to all industries, \$47.85 versus \$44.67, respectively. This information provides a useful economic indicator for the industry and can also be used to guide long-term workforce planning and recruitment efforts through understanding how construction compares to other industries.

RELATED CPWR PRODUCTS

- CPWR—The Center for Construction Research and Training. [2025]. Health Insurance Coverage. [dashboard]. www.cpwr.com/research/data-center/construction-chart-book/interactive-7th/employment-income/.
 - This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by year.
- CPWR—The Center for Construction Research and Training. [2025]. Retirement Plans. [dashboard]. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/employment-income/.

DEFINITIONS

- **Benefits** – Includes paid leave, supplemental pay, insurance, retirement and savings, and legally required benefits (e.g., Medicare, Social Security).
- **Employment Cost Index (ECI)** – A quarterly index measuring change over time in labor costs.
- **Wages and salaries** – Includes base pay, commissions, bonuses and incentives, as well as cost-of-living adjustments.

DATA SOURCES AND NOTES

U.S. Bureau of Labor Statistics (BLS). (2025). Employment Cost Index. www.bls.gov/eci/.

- The survey covers nonfarm private industries in addition to state and local government workers.
- Federal government, agricultural, and self-employed workers are excluded.

U.S. Bureau of Labor Statistics (BLS). (2025). Employer Costs for Employee Compensation. www.bls.gov/ecec/home.htm.

- Data for private industry.

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Wages in Construction

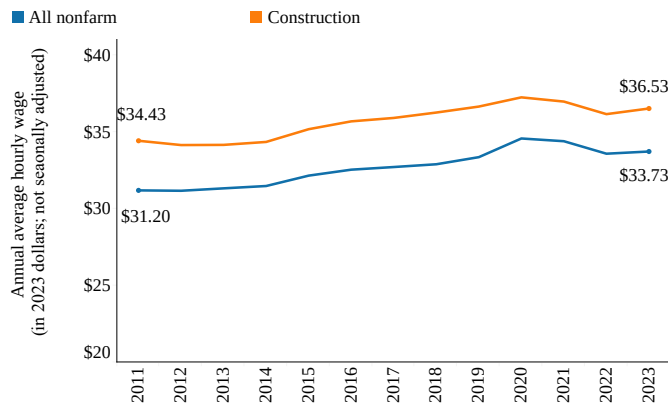
Wages are a key element of employment costs (see Chapter 24), which is an important indicator of the health of the overall labor market and economy (FRBSF, 2007). Monitoring wage differences between groups can also identify wage gaps, such as differences by sex, ethnicity, race, or other characteristics.

This chapter examines average hourly wages in 2023 dollars reported by U.S. Bureau of Labor Statistics (BLS) Current Employment Statistics (CES), a payroll survey of businesses that shows private wage-and-salary information. In addition, wage data was also collected by the BLS Current Population Survey (CPS), which is a household survey that shows *self-reported* wage information.

FINDINGS

Among private wage-and-salary workers, the average hourly wage in construction was consistently higher than in all industries from 2011 to 2023 (Chart 25a). In 2023, the average hourly wage in construction was \$36.53, compared to \$33.73 for all nonfarm employment. While average hourly wages in construction were higher throughout this period, they grew at a slightly slower pace than in all industries, 6.1% versus 8.1% respectively, after adjusting for inflation. The slower increase may indicate a softer labor market, as well as signal inflation's impact on the industry (Fu, 2025).

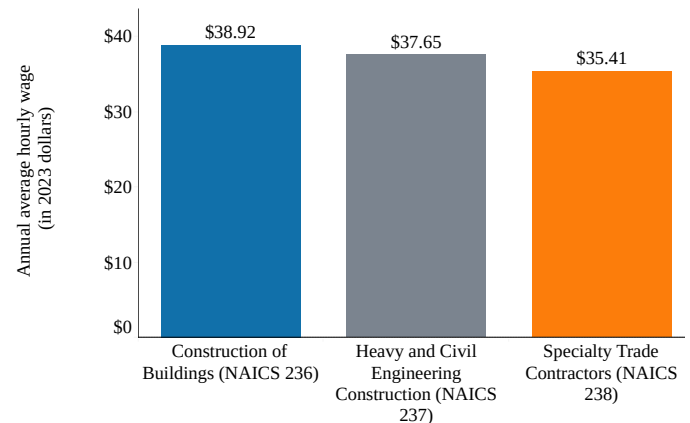
Chart 25a. Average hourly wage, construction versus all non-farm industries (2011-2023; private wage-and-salary)



Source: U.S. Bureau of Labor Statistics, 2011-2023 Current Employment Statistics.

Of the three *major construction subsectors*, workers in Construction of Buildings (NAICS 236; \$38.92) were paid the highest average hourly wages in 2023, followed by workers in Heavy & Civil Engineering (NAICS 237; \$37.65) and Specialty Trade Contractors (NAICS 238; \$35.41; Chart 25b).

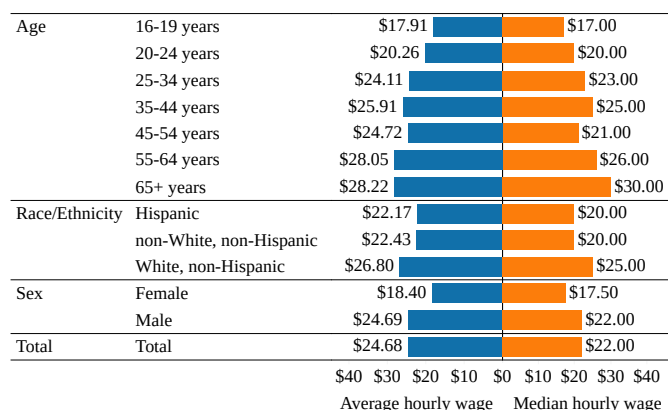
Chart 25b. Average hourly wage, by major subsector (2023; private wage-and-salary)



Source: U.S. Bureau of Labor Statistics, 2023 Current Employment Statistics.

Among all construction workers, the average hourly wage was \$24.68, while the median in 2023 was \$22.00 (Chart 25c). By age, workers 16 to 19 years old had the lowest hourly wage (Average: \$17.91; Median: \$17.00) while workers 65 years or older had the highest hourly wage (Average: \$28.22; Median: \$30.00). By race/ethnicity, white, non-Hispanic workers had the highest hourly wage (Average: \$26.80; Median: \$25.00). By sex, males had the highest hourly wage (Average: \$24.69; Median: \$22.00).

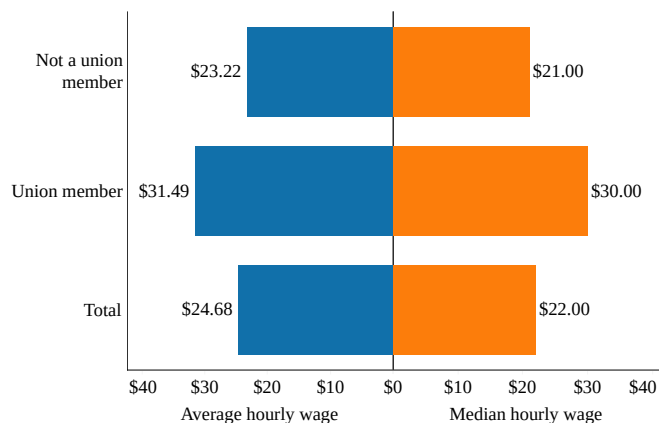
Chart 25c. Average hourly and median wage, by demographics (2023)



Source: IPUMS, 2023 Current Population Survey.

Union status also resulted in differences in wages, with *union members'* average hourly wage 1.4 times higher than *non-union members* (\$31.49 versus \$23.22; Chart 25d). Union members also had a higher median wage, \$30.00 versus \$21.00. These differences are the result of the union bargaining power, which provides members with higher wages and benefits than non-union members (AFL-CIO, n.d.).

Chart 25d. Average hourly and median wage among construction workers, by union status (2023)



Source: IPUMS, 2023 Current Population Survey.

TAKEAWAYS

The average hourly wage for construction increased from 2011 to 2023; however, there were wage gaps identified by major subsector, demographics, and union status. These findings provide information that can be used for the recruitment and retention of workers, as well as for employer planning.

RELATED CPWR PRODUCTS

- CPWR—The Center for Construction Research and Training. [2025]. Income and Benefits. [dashboard]. cpwr.com/research/data-center/construction-chart-book/interactive-7th/employment-income/.
 - This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by year.

DEFINITIONS

- Major subsector** – 3-digit NAICS codes within construction (NAICS 23). See Chapter 1 "Pulling and Classifying Data" for details.
- Self-reported** – Reported by a survey respondent.
- Union status** – Indicates for the current job if the respondents were a member of a labor union or an employee association.
 - Non-union member** – For current job, the respondent had no union coverage or was covered by a union but not a member.
 - Union member** – For current job, the respondent was a member of a labor union.

DATA SOURCES AND NOTES

Sarah Flood, Miriam King, Renae Rodgers, Steven Ruggles, J. Robert Warren, Daniel Backman, Annie Chen, Grace Cooper, Stephanie Richards, Megan Schouweiler, and Michael Westberry. IPUMS CPS: Version 12.0 [dataset]. Minneapolis, MN: IPUMS, 2024. doi.org/10.18128/D030.V12.0.

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- Data is for private wage-and-salary employment.

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Health Insurance in Construction

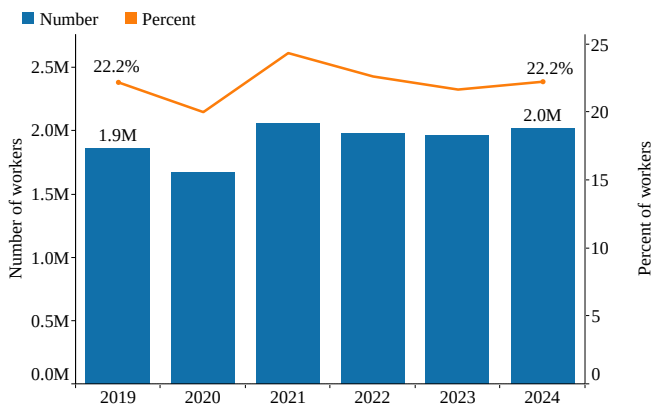
Due to the dangers of construction, health insurance is vital for workers. While a considerable percentage of people in the industry are insured, nearly a quarter were uninsured in 2018, double the percentage of all other workers (Brown et al., 2020).

Construction trails other industries in providing *employer-based health insurance*, one of the most common sources of coverage. According to a recent study, 62.9% of individuals 19 to 64 years old were covered under an employment-based plan in the U.S. (Keisler-Starkey & Bunch, 2023). Prior research also found that construction workers were less likely to work for an employer that offers employer-based health insurance than workers in other industries (Claxton & Rae, 2023).

FINDINGS

First, the number and percent of construction workers without health insurance from 2019 to 2024 were examined (Chart 26a). During this period, the number of uninsured construction workers increased 5.3% (1.9 million (M) to 2.0M) while the percentage of uninsured workers remained the same (22.2%). There was a noticeable increase in both the number and percentage of uninsured construction workers from 2020 to 2021, which is consistent with findings among full-time workers aged 19 to 64 years old in all industries (Keisler-Starkey et al., 2023).

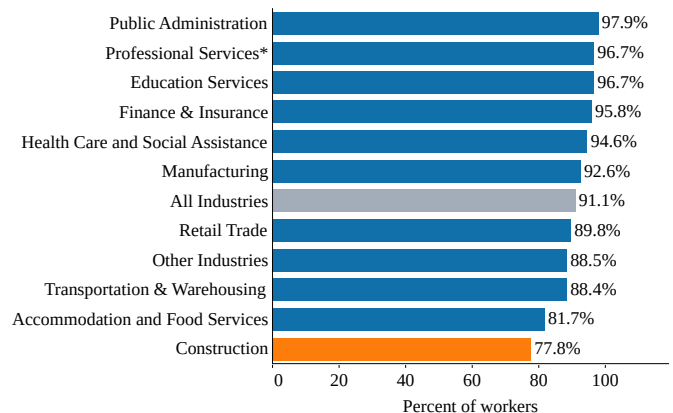
Chart 26a. Number and percent of uninsured construction workers (2019-2024)



Source: IPUMS, 2019-2024 CPS Annual Social and Economic Supplement.

Next, the percentage of workers with health insurance were analyzed by industry (Chart 26b). In 2024, construction had the lowest percentage of insured workers (77.8%), which was 13.3% lower than the rate for all industries (91.1%). Public administration led all industries with the highest percentage of insured workers (97.9%).

Chart 26b. Percent of workers with health insurance, by industry (2024)

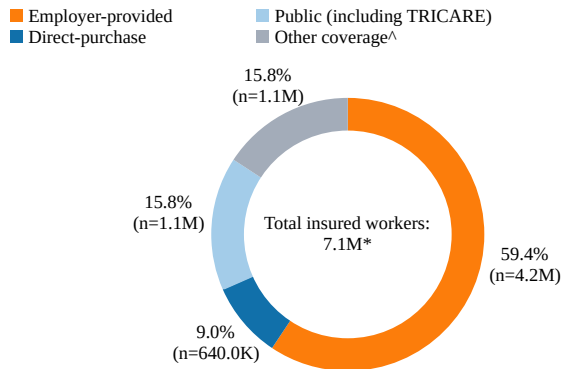


Source: IPUMS, 2024 CPS Annual Social and Economic Supplement.

*Includes professional, scientific, and technical services.

In 2024, there were over 7 million (M) insured construction workers (Chart 26c). More than half (59.4%) had employer-provided health insurance. In addition, 15.8% (n=1.1M) had public coverage and 15.8% (n=1.1M) had other coverage plans (e.g., private marketplace and non-marketplace coverage). The least common source of health insurance was a *direct-purchase* plan (9.0%; 640.0 thousand).

Chart 26c. Source of health insurance among construction workers (2024)



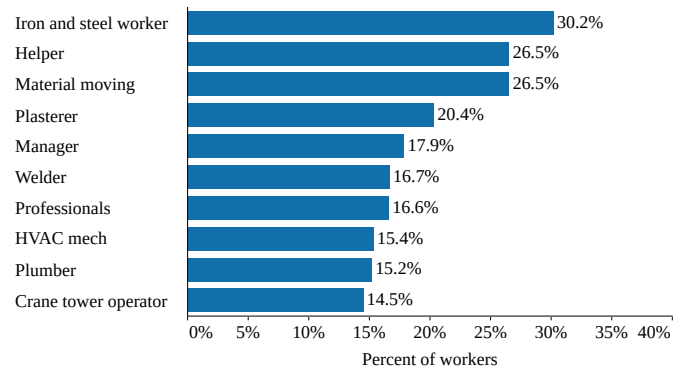
Source: IPUMS, 2024 CPS Annual Social and Economic Supplement.

*Values do not sum to 7.1M due to rounding.

^Includes private marketplace and non-marketplace coverage plans.

Within construction, the percentage of workers with employer-based health insurance varied considerably by occupation (Chart 26d). In 2024, nearly a third of iron and steel workers did not have health insurance provided by an employer (30.2%). Similarly, over a quarter of helpers (26.5%) and material movers (26.5%) did not have employer-sponsored insurance.

Chart 26d. Occupations within the construction industry with the highest percentage of workers that did not receive employer-provided health insurance (2024)



Source: IPUMS, 2024 CPS Annual Social and Economic Supplement.

TAKEAWAYS

Construction had the lowest percentage of health insurance coverage among major industries, with nearly a quarter of its workers being uninsured in 2024. Of those covered, only 59.4% received coverage from their employer, which is lower than the average (63.9%) reported for all industries (Keisler-Starkey & Bunch, 2023). Iron and steel workers (30.2%), helpers (26.5%), and plasterers (20.4%) had the highest percentages of workers who did not receive employer provided health insurance.

Construction remains a dangerous industry, and incurring severe on-the-job injuries could lead to costly medical expenses for construction workers and their families. For this reason, health insurance coverage among construction workers should be regularly monitored.

RELATED CPWR PRODUCTS

- CPWR—The Center for Construction Research and Training. [2025]. Health Insurance in Construction. [dashboard]. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/employment-income/.
 - o This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by year.

DEFINITIONS

- **Direct-purchase health insurance** – Health insurance plan purchased by an individual from a private company or through an exchange (U.S. Census Bureau, 2021).
- **Employer-based health insurance** – Healthcare coverage through one's employer or a relative's employer (U.S. Census Bureau, 2021).
- **Public health insurance** – Health insurance plans funded by governments at the federal, state, and local level, which includes plans such as Medicare and Medicaid (U.S. Census Bureau, 2021).

DATA SOURCES AND NOTES

Sarah Flood, Miriam King, Renae Rodgers, Steven Ruggles, J. Robert Warren, Daniel Backman, Annie Chen, Grace Cooper, Stephanie Richards, Megan Schouweiler, and Michael Westberry. IPUMS CPS ASEC: Version 12.0 [dataset]. Minneapolis, MN: IPUMS, 2024. doi.org/10.18128/D030.V12.0.

- All charts show data for wage-and-salary workers.

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Retirement Plans in Construction

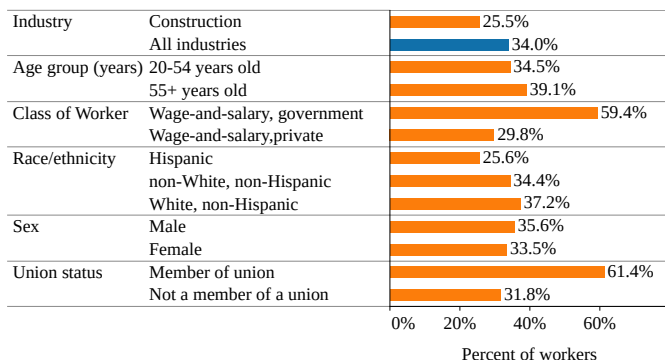
Historically, access to retirement benefits in blue-collar *occupations* is lower than for all workers, but union members tend to have higher access to retirement benefits (Friedman, 2023). A retirement plan can serve as the backbone of a company's benefits package and can also support employees' well-being (Brooks, 2023). In construction, as in other industries, retirement plans are important for attracting and retaining workers. Monitoring retirement trends in the industry is important in part because employment is projected to increase from 2022 to 2032 (BLS, n.d.). In the fourth quarter of 2022, retirement and savings benefits comprised over 5% of all costs and 17% of benefit costs in the private construction industry (Harris et al., 2023).

Retirement information is collected by the U.S. Department of Labor (DOL) through Form 5500. *Multiemployer plans*, which are commonly used in construction, are a collectively bargained retirement plan kept by more than one employer (CPWR, 2018; PBGC, 2022). A multiemployer plan can take the form of a *defined benefit* (traditional pension) or *defined contribution* pension plan (401(k)-type plan; CPWR, 2018; Papadopoulos & Ghilarducci, 2020). Analyzing participation in retirement plan types is important, particularly as the industry has shifted towards defined contribution plans in the last several decades (Dong et al., 2017; Works, 2016). This chapter examines reported participation in a *retirement or pension plan* for wage-and-salary workers, referenced as retirement plan throughout, as well as reported plan participation by the DOL.

FINDINGS

In 2024, 25.5% of construction workers participated in a retirement plan, compared to 34.0% for all industries (Chart 27a). Approximately 39% of construction workers 55 years or older. Hispanic workers also had relatively low participation percentages (25.6%), and males had a slightly higher rate than females, 35.6% versus 33.5%. By *union status*, members had the highest participation rate by examined characteristics, with 61.4% of members participating in a retirement plan. *Wage-and-salary* government construction workers were twice as likely to participate in a plan than wage-and-salary private workers (59.4% versus 29.8%).

Chart 27a. Participation in retirement or pension plans, by selected characteristics (2024; wage-and-salary workers)*^



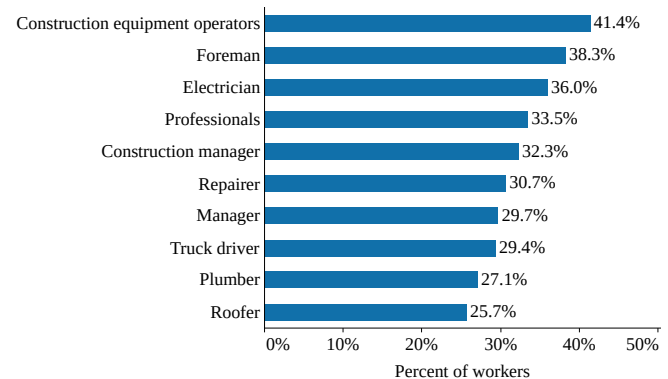
Source: IPUMS, 2024 Current Population Survey.

*Frequencies for sample sizes less than 15 were excluded.

^All characteristics except for "all industries" show statistics for construction workers.

Next, the top *occupations* among construction workers by plan participation in 2024 were analyzed (Chart 27b). Construction equipment operators (41.4%), foremen (38.3%), and electricians (36.0%) had the highest rates.

Chart 27b. Top ten occupations among construction workers*, by participation in work pension plan (2024)

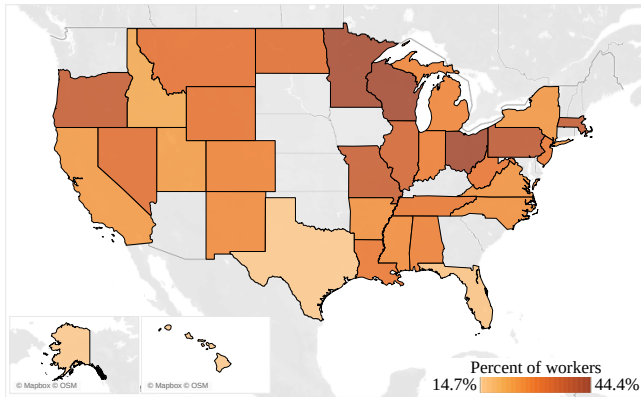


Source: IPUMS, 2024 Current Population Survey.

*Frequencies for sample sizes less than 15 were excluded.

In 2024, the five states with the highest percent participating in a retirement plan were Ohio (44.4%), Wisconsin (44.3%), Minnesota (43.6%), Pennsylvania (39.4%), and Massachusetts (38.3%; Chart 27c). The five states with the lowest participation percentages were Texas (14.7%), Florida (15.7%), Idaho (21.3%), Utah (23.5%) and California (24.0%).

Chart 27c. Reported participation in work pension plan, by state* (2024)

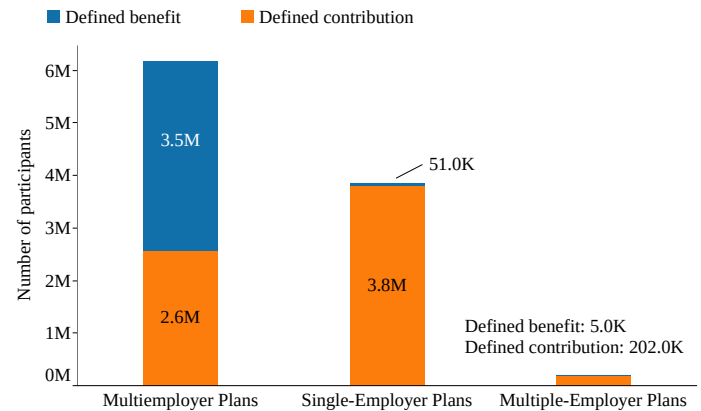


Source: IPUMS, 2024 Current Population Survey.

*States with no color were excluded due to small sample size (frequency < 15).

According to the DOL, approximately 60% of construction workers participating in a retirement plan in 2022 were enrolled in multiemployer plans (Chart 27d). These plans can be divided into defined-benefit plans and defined-contribution plans, and that year, 58.3% of multiemployer plan participants were in defined benefit plans. However, defined benefit plans only comprised 1.3% of the single-employer plans.

Chart 27d. Retirement savings plans, by benefit type (2022)



Source: U.S. Department of Labor, 2022 Employee Benefits Security Administration, Form 5500, Private Pension Plan.

TAKEAWAYS

Increasing retirement benefit access can help attract and retain construction workers. In 2024, 25.5% of construction workers reported participation in a retirement plan, compared to almost 34% in all industries. Non-Hispanics, females, union members, public wage-and-salary workers, and workers 55 years or older had higher than average participation rates.

Monitoring retirement trends is important to the industry, particularly as the aging workforce continues to grow, increasing 5.4% just from 2021 to 2022 (CPWR, 2025). In addition, overall construction employment is projected to increase in construction indicating a need to support the workforce (BLS, n.d.).

RELATED CPWR PRODUCTS

- CPWR—The Center for Construction Research and Training. [2025]. Retirement Trends. [dashboard]. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/employment-income/.
 - This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by year.

DEFINITIONS

- **Defined benefit plan** – Benefits based on a percentage of earnings during a specified number of years.
- **Defined contribution plans** – Benefits based on employer and employee contributions, plus or minus investment gains or losses.
- **Multiemployer plan** – Collectively bargained and maintained by more than one employer, usually within the same or related industries, such as construction.
- **Multiple employer plan** – Maintained by two or more unrelated employers.

- **Occupation** – Reported main occupation worked the week before the survey according to the 2018 Census Classification Scheme. Email datacenter@cpwr.com to request codes.
- **Retirement or pension plan** – Indicates whether the respondent had a pension or other retirement plan.
- **Union status** – Indicates whether the respondent was a member of a labor union or employee association similar to union.
 - **Non-union member** – For current job, the respondent had no union coverage or was covered by a union but not a member.
 - **Union member** – For current job, the respondent was a member of a labor union.
- **Wage-and-salary** – Individuals who receive wages, salaries, commissions, tips or payment in kind from their employer.

DATA SOURCES AND NOTES

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- Note: DOL data from 2023 and 2024 not available.

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Workers' Compensation in Construction

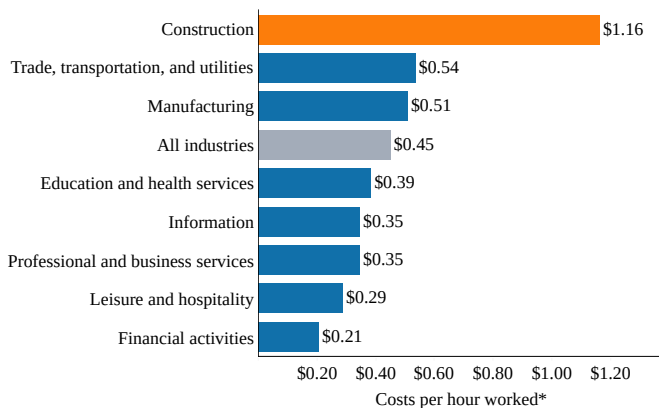
Workers' compensation is designed to provide cash benefits and medical treatment for those who suffer work-related injuries or illnesses, as well as death and funeral benefits to workers' survivors (SSA, 2017). Because the hazardous nature of construction means its workers have higher injury rates and more expensive workers' compensation claims than other industries (Davis and Voll, 2020). In addition, according to a 2024 insurance industry study, construction had the most expensive compensation claims, almost double the average claim of all industries (Travelers, 2024).

Due to the higher risk of injuries and cost of claims, the industry has the highest workers' compensation premium (e.g., cost to keep policy active) in National Council on Compensation Insurance (NCCI) states (Jacobson, 2024). Monitoring workers' *compensation* costs paid can provide a baseline of average costs by business owners and HR professionals, as well as provide a safety and health measure, since as costs are associated with a company's accident and claim history. This chapter examines workers' compensation costs in construction and other industries as a comparison.

FINDINGS

Among private industries, the average cost of workers' compensation per hour worked was 2.6 times higher in construction than all industries in 2023 (\$1.16 versus \$0.45; Chart 28a). The cost was 2.1 times higher in construction than trade, transportation, and utilities, whose workers had the second highest cost per hour. The higher cost for workers' compensation per hour worked in construction aligns with the industry having one of the highest injury rates, and many of these injuries are high-compensation cost injuries, including motor vehicle, falls/slips, caught-in/between, struck-by, and sprain (NSC, n.d.).

Chart 28a. Cost of workers' compensation per hour worked, by private industry (2023)

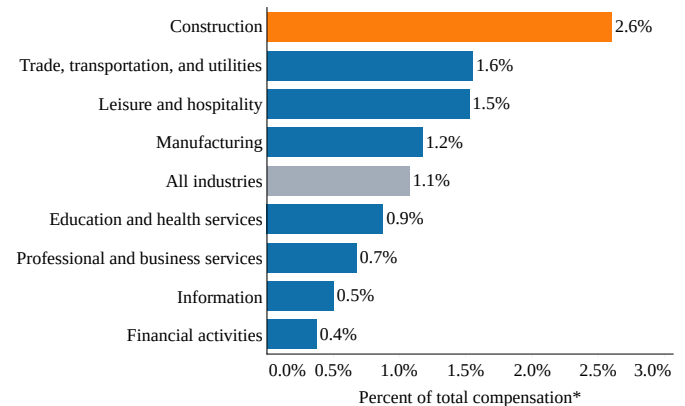


Source: U.S. Bureau of Labor Statistics, 2023 *Employer Costs for Employee Compensation (ECEC)*.

*Averaged quarterly data to produce an annual estimate.

Next, workers' compensation as a percentage of total compensation costs by industry were examined (Chart 28b). In 2023, workers' compensation accounted for 2.6% of total compensation costs in construction, while only accounting for 1.1% of total compensation costs for all private industries. In many sectors, the figure was significantly lower: for example, in financial activities only 0.4% of total compensation costs were spent on workers' compensation.

Chart 28b. Workers' compensation as percent of total compensation, by private industry (2023)



Source: U.S. Bureau of Labor Statistics, 2023 *Employer Costs for Employee Compensation (ECEC)*.

*Averaged quarterly data to produce an annual estimate.

TAKEAWAYS

Almost 3% of compensation costs for construction workers went to workers' compensation, which was much higher than other industries examined. Workers' compensation is a required expense which has been increasing in the construction industry in recent years (Kirsch CPA Group, 2024).

To reduce workers' compensation costs, employers can address potential hazards and exposures that may lead to claims. For guidance, check out CPWR's research-to-practice resources: www.cpw.com/research/research-to-practice-r2p/.

DEFINITIONS

- **Compensation costs** – Employer costs for compensation, such as salaries and benefits for employees.
- **Workers' compensation** – Provides business owners with a policy that helps pay medical bills, lost wages, and other costs associated with at-work injuries or illnesses their employees may experience.

DATA SOURCES AND NOTES

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Hours Worked, Overtime, and Time Use

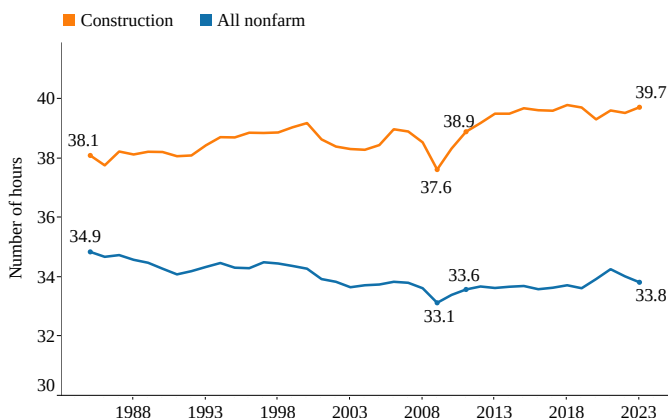
Historically, the construction industry is prone to long work hours (Gómez-Salgado et al., 2023), temporary or seasonal work (CPWR, 2023), and nonstandard work arrangements (CPWR, 2019). These characteristics, among others, can increase construction workers' susceptibility to work-life imbalance. Studies have shown multiple benefits to work-life balance, including improved productivity, reduced absenteeism, reduced turnover, and better worker mental and physical health (Kalev & Dobbin, 2022). It also boosts job satisfaction and organizational commitment (Gragnano et al., 2020).

Research has also found that long working hours is linked to poor mental health, including emotional fatigue, low well-being, depression, negative feelings such as anger and resentment, sleep issues, and burnout (Liswandi & Muhammad, 2023). Longer working hours can also lead to short sleep duration, which has been shown to damage the mental health (Wong et al., 2019). Given the consequences of poor work-life balance, it is important to monitor how much time construction workers spend at work and on other daily activities. This chapter examines work-life balance through reported hours worked, overtime, and time spent on various activities.

FINDINGS

Average *hours worked* for production workers, called *craftworkers* for the remaining portion of the chapter and the **Construction Chart Book**, were examined first (Chart 29a). Craftworkers in construction worked more hours per week on average from 1985 to 2023 than those in all nonfarm industries (includes construction). Following the *Great Recession*, average hours worked per week among construction production workers increased 3.4% from 2009 to 2011 (37.6 to 38.9 hours). From 2011 to 2023, average hours worked increased 2.1% in construction (38.9 to 39.7 hours) and, 0.60% (33.6 to 33.8 hours) in all nonfarm industries.

Chart 29a. Average hours worked per week, construction versus all nonfarm industries (1985-2023; private production workers)*

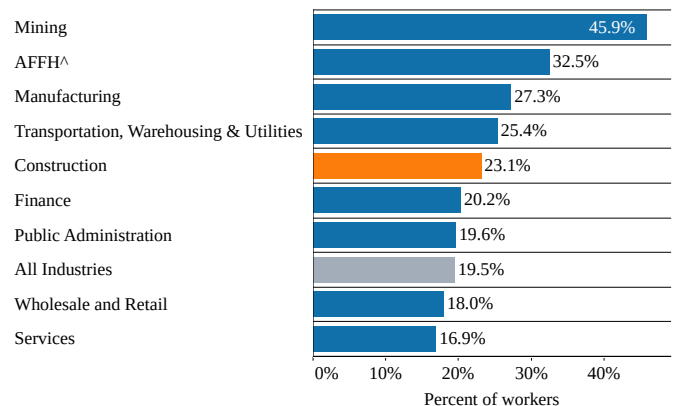


Source: U.S. Bureau of Labor Statistics, 1985-2023 Current Employment Statistics Table B-7.

*Annual average calculated by CPWR's Data Center.

Next, *overtime* at a worker's main job was examined by industry (Chart 29b). In 2023, nearly a quarter (23.1%) of construction workers reported working overtime, which was higher than all industries combined (19.5%). Mining was the industry with the highest percentage of reported overtime, at almost twice that of construction (45.9% versus 23.1%).

Chart 29b. Percentage of employees working overtime, by industry (2023)

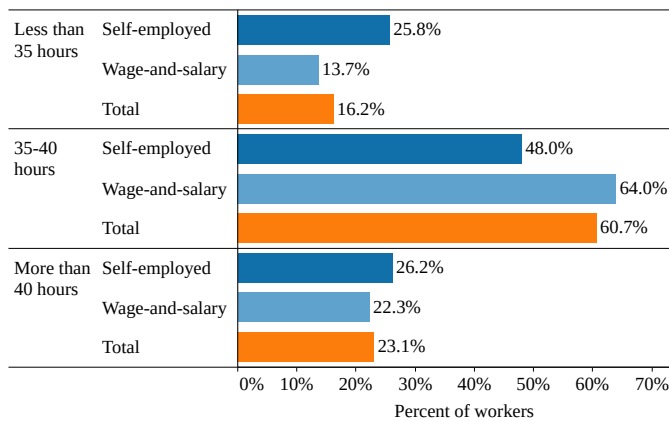


Source: IPUMS, 2023 Current Population Survey.

^Agriculture, Forestry, Fishing, and Hunting.

Hours worked at primary job were then examined by *worker class* (Chart 29c). In 2023, more than half (60.7%) of all construction workers reported working *full-time*. Of those, *self-employed* workers were more likely than wage-and-salary workers to work *part-time* (25.8% versus 13.7%), as well as *overtime* (26.2% versus 22.3%) in 2023. This finding highlights the flexibility that self-employed individuals have when setting their work schedule (DOL, n.d.).

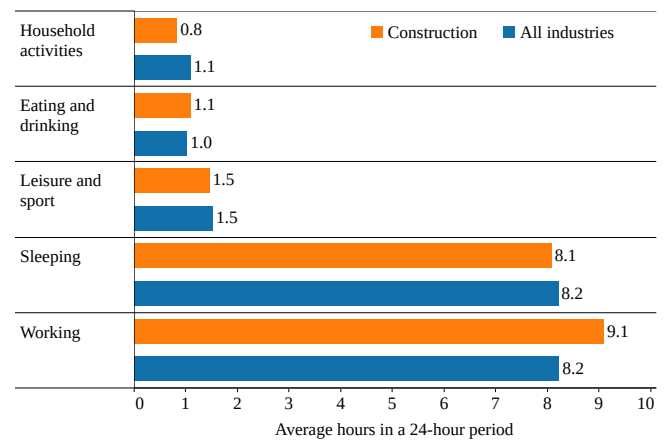
Chart 29c. Hours worked per week in construction, by worker class (2023)



Source: IPUMS, 2023 Current Population Survey.

The American Time Use Survey (ATUS) was used to explore time workers spent on activities over a 24-hour period (Chart 29d). From 2021 to 2023, construction workers devoted slightly more hours to work and work-related activities than the average worker (9.1 versus 8.2 hours). Meanwhile, they spent slightly less time on household activities (0.8 versus 1.1 hours) and sleeping (8.1 versus 8.2 hours). This may be the result of more construction workers working overtime, as shown in Chart 29b (23.1% versus 19.5%).

Chart 29d. Reported time use in a 24-hour period, construction versus all industries (2021-2023 average)



Source: IPUMS, 2021-2023 American Time Use Survey.

TAKEAWAYS

Over time, hours worked by craftworkers has increased in construction but remained constant in all nonfarm industries. This may be the result of construction workers being more likely to work overtime compared to all industries, resulting in higher average hours worked (23.1% versus 19.5%).

Self-employed workers were more likely than wage-and-salary workers to work part-time (25.8% versus 13.7%) or overtime (26.2% versus 22.3%). This aligns with findings reported for all workers, with 24% of self-employed and 16% of all workers working part-time (Braga, 2023).

Construction workers reported working 0.9 more hours per week than those in all industries, on average, from 2021 to 2023. This difference may signify greater susceptibility among construction workers to work-life imbalance. Findings on hours worked and time spent highlight the need to implement policies that support a healthy work-life balance for construction workers, especially as mental health continues to be a priority in the construction industry.

RELATED CPWR PRODUCTS

- CPWR—The Center for Construction Research and Training. [2025]. Hours Worked, Overtime, and Time Use. [dashboard]. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/other-topics/.
 - This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by year.

DEFINITIONS

- Craftworker** – All workers, except managerial, professional (i.e., architects, accountants, lawyers, etc.), administrative support workers. Also called blue-collar or production workers.

- **Great Recession** – Period from 2007 to 2010 during which there was a decline in the global economy.
- **Hours worked** – The number of reported hours worked in the last week in CPS data and hours worked in the 24-hour period examined in ATUS data.
 - **Full-time** – Reported working 35-40 hours a week.
 - **Part-time** – Reported working less than 35 hours a week.
 - **Overtime** – Reported working more than 40 hours a week.
- **Worker class** – Indicates if a worker was self-employed, worked in private industry, public sector, was in the armed forces, or other work arrangement. For more information, see: cps.ipums.org/cps-action/variables/CLASSWKR#codes_section.
 - **Self-employed** – Individuals who work for themselves or their own legal corporation.
 - **Wage-and-salary** – Workers who receive wages, salaries, commissions, tips, or pay from their employer.

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- Data weighted using the final basic weight. Estimates may not be directly comparable to U.S. Bureau of Labor Statistics estimates.

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Educational Attainment among Construction Workers

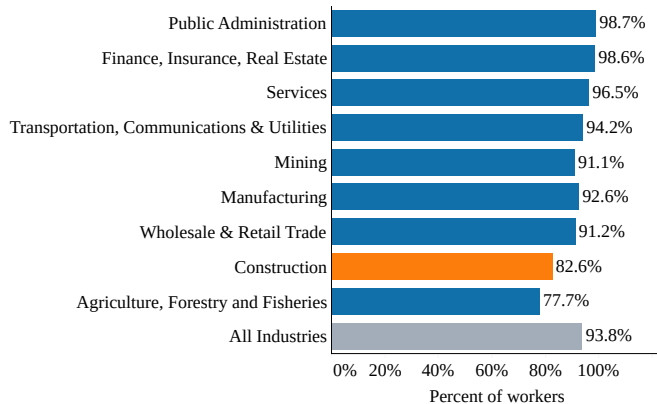
Higher educational attainment levels are usually associated with higher wages and lower unemployment (Brundage, 2017), and historically construction has had one of the lowest levels of educational attainment. Typically, a bachelor's degree is not required to enter the construction industry, and the lack of a college degree does not normally limit career growth potential in the industry, though it can slow the rate of career development (Rodrigues, 2019). *Apprenticeships* (examined in Chapter 31) are a common pathway to joining the industry (Torpey, 2019).

Education is also associated with safety and health outcomes. Workers with less education are more likely to work in high-risk occupations than those with more education (Virginia Commonwealth University, 2015). This connection is one reason there is a need to continue to examine educational attainment among construction workers, particularly since construction has historically had one of the highest injury rates (CPWR, 2018). This chapter examines educational attainment by industry, worker type, union status, and demographics.

FINDINGS

In recent years, construction has had the second-lowest percentage of workers 25 years or older with at least a high school diploma (Chart 30a). In 2023, for example, about 83% (82.6%) of *construction workers* had at least a high school diploma, compared to 93.8% in all industries. This finding may reflect the fact that construction knowledge and skills are often learned via on-the-job training, certifications and apprenticeships, as opposed to more traditional education programs (Torpey, 2019).

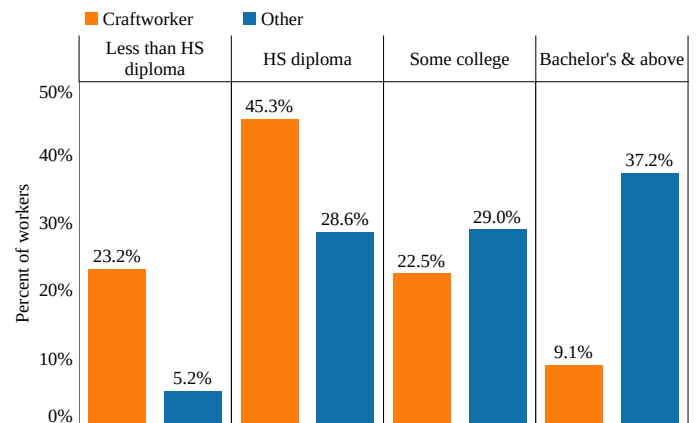
Chart 30a. Percentage of employees who have at least a high school diploma, by industry (2023)



Source: IPUMS, 2023 Current Population Survey.

Among construction workers, *educational attainment* varied by worker type (*craftworker* and *other*), union status, and demographics (Chart 30b-Chart 30d). In 2023, nearly a quarter of craftworkers (23.2%) did not have a *high school diploma*, compared to 5.2% of *other workers*, such as office workers (Chart 30b). Other workers were four times more likely than craftworkers to have a bachelor's degree or higher (37.2% versus 9.1%, respectively). The U.S. Bureau of Labor Statistics (BLS) reports entry-level education requirements by common construction occupations, and its data highlights many occupations without traditional educational requirements (e.g., college degrees; Torpey, 2019).

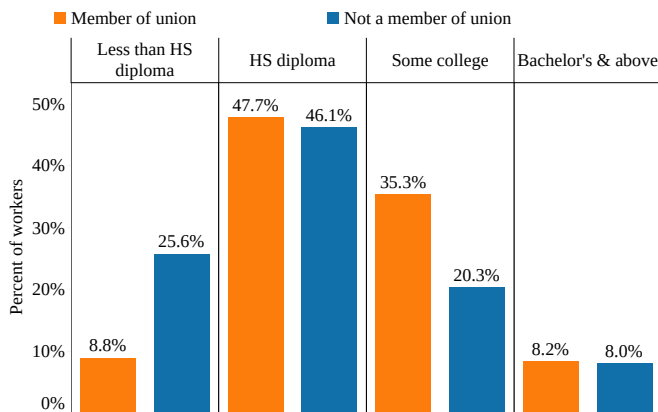
Chart 30b. Distribution of educational attainment among construction workers, by worker type (2023)



Source: IPUMS, 2023 Current Population Survey.

The proportion of workers with high school diplomas and bachelor's degrees were relatively similar between *union members* (47.7% and 8.2%, respectively) and *non-union members* (46.1% and 8.0%, respectively; Chart 30c). Workers who were not union members were more likely to lack a high school diploma than union members (25.6% versus 8.8%), while union members were more likely to have some college than non-members (35.3% versus 20.3%).

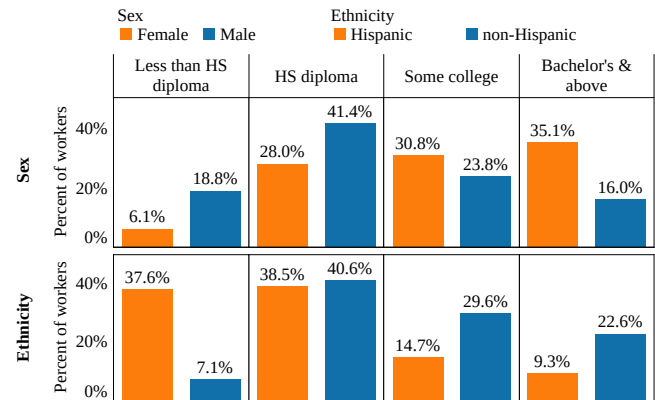
Chart 30c. Distribution of educational attainment among construction workers, by union status (2023, Craftworkers)



Source: IPUMS, 2023 Current Population Survey.

In 2023, men in construction were three times more likely than women to have less than a high school diploma (18.8% versus 6.1%; Chart 30d). Women were twice as likely to have a bachelor's degree or higher (35.1% versus 16.0%, respectively). By ethnicity, Hispanic workers were five times more likely than non-Hispanics to have less than a high school diploma (37.6% versus 7.1%).

Chart 30d. Distribution of educational attainment among construction workers, by demographics (2023)



Source: IPUMS, 2023 Current Population Survey.

TAKEAWAYS

These trends highlight disparities in education both between construction and other industries and disparities among construction workers. However, construction offers many occupations with career growth potential that do not require college degrees (Torpey, 2019).

Lower educational barriers, coupled with the industry's relatively high wages, may help fill employment gaps and meet the growing demand for workers. Apprenticeships are often a pathway to construction careers and are examined in detail in Chapter 31: Apprenticeships in Construction.

DEFINITIONS

- **Apprenticeship** – A combination of paid classroom training with paid on-the-job training.
- **Construction worker** – Individuals aged 25+ whose main job was in the construction industry (Census classification scheme industry code 770) the week before the survey was conducted.
- **Craftworkers** – All workers, except managerial, professional (i.e., architects, accountants, lawyers, etc.), administrative support workers. Also called blue-collar or production workers.
- **Educational attainment** – The highest grade of school completed, or the highest degree completed.
 - **High school diploma** – Includes high school diploma and equivalent.
- **Other workers** – Includes managerial, professional, and administrative support workers. Also called white-collar workers.
- **Union status** – Indicates whether the respondent was a member of a labor union or employee association similar to union.
 - **Non-union member** – For current job, the respondent had no union coverage or was covered by a union but not a member.
 - **Union member** – For current job, the respondent was a member of a labor union.

DATA SOURCES AND NOTES

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Rodrigues, L. F. (2019). The Impact of Education on Career Growth in the Construction Industry. digitalcommons.calpoly.edu/cgi/viewcontent.cgi?article=1344&context=cmisp#.

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Apprenticeships in Construction

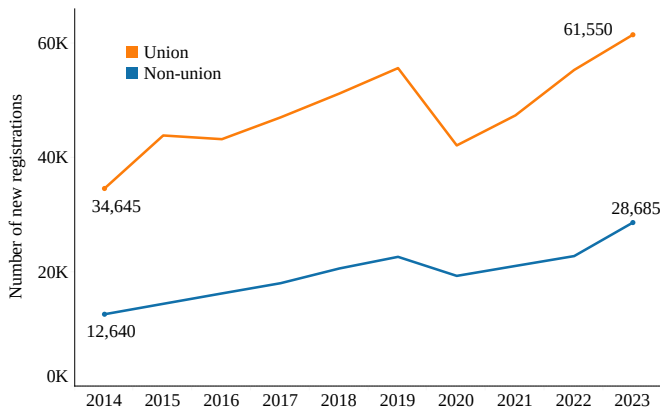
The construction trades use *apprenticeships* for recruitment and training of workers, who often find a gateway to a building trades career (Construction Careers Foundation, 2024; DOL, n.d.). Playing a critical role in the labor market, apprenticeships can improve workforce outcomes such as employment, retention, earnings, and credential attainment (Employment and Training Administration, n.d.).

Since 2015, the U.S. government has invested over \$1 billion to expand and modernize apprenticeship programs (Hegewisch, 2024). Data to monitor apprenticeships is collected by the U.S. Department of Labor, which publishes this information on [public dashboards](#) that can be filtered by industry. This data was used to examine apprenticeship trends in construction from 2014 to 2023.

FINDINGS

New registrations for apprenticeships first were examined by *union status* (Chart 31a). From 2014 to 2023, *union* construction apprenticeship programs experienced a 77.7% increase (34,645 to 61,550) and *non-union* programs registrants increased 126.9% (12,640 to 28,685). In 2023, the number of new registrations in union programs was 2.1 times higher than new registrations in non-union programs; in 2014, it was 2.7 times higher.

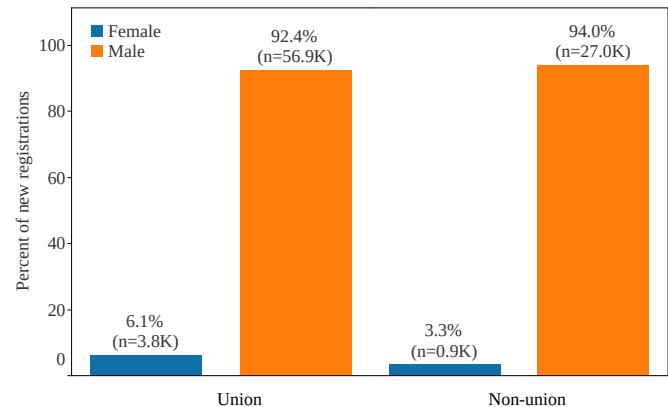
Chart 31a. New registrations in construction apprenticeship programs, by union status (2014-2023)



Source: U.S. Department of Labor, 2014-2023 Apprentices by Apprentice Location Public Data.

In 2023, 94% of new registrants in construction apprentice programs were men (Chart 31b). Of male apprentices, 67.9% registered for a union apprenticeship. The ratio of union apprenticeship registrations to non-union registrations was higher among women than among men, 4.0 vs. 2.1.

Chart 31b. New registrations in construction, by sex and union status (2023)*

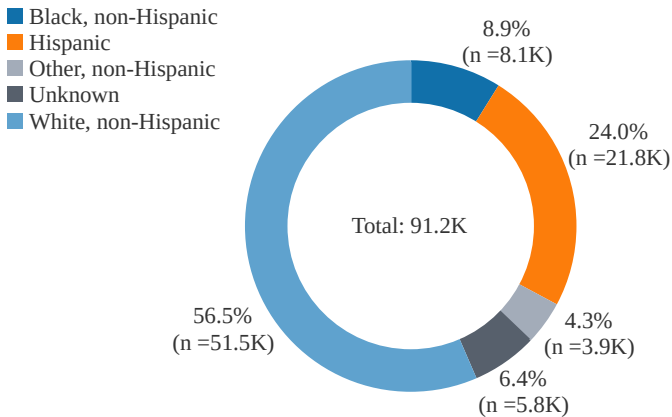


Source: U.S. Department of Labor, 2023 Apprentices by Apprentice Location Public Data.

*Total does not sum to 100% due to excluding unknown.

More than half (56.5%) of new registrations in 2023 were white and non-Hispanic apprentices (Chart 31c), and almost a quarter (24.0%) were among Hispanic apprentices. Black apprentices accounted for 8.9% of new registrations.

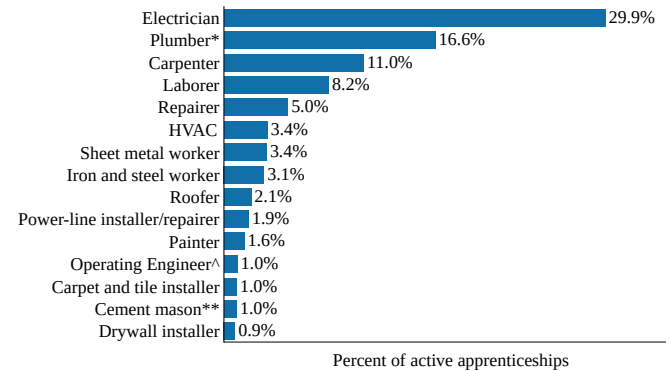
Chart 31c. New registrations in construction, by race and ethnicity (2023)



Source: U.S. Department of Labor, 2023 Apprentices by Apprentice Location Public Data.

Over half (65.7%) of all *active apprentices* in 2023 worked in four construction occupations: electricians, plumbers, carpenters, and laborers. Electricians were the most common trade for apprentices, account for nearly a third (29.9%; Chart 31d). The next most popular occupations were plumbers (16.6%), carpenters (11.0%), and laborers (8.2%).

Chart 31d. Top 15 selected construction occupations among active apprentices (2023)



Source: U.S. Department of Labor, 2023 Apprentices by Apprentice Location Public Data.

*Plumber includes pipefitters, steamfitters, and gas fitters.

^Operating engineers include construction equipment operators.

**Cement mason includes terrazzo finishers.

TAKEAWAYS

Over the past decade, construction apprenticeships have risen. In 2023, there were twice as many registrations for union-sponsored apprenticeships than non-union apprenticeships (61,550 versus 28,685). However, from 2014 to 2023 there was greater percentage growth in non-union programs (126.9%) than in union-sponsored programs (77.7%). This trend could be explained by the fact that union membership among American workers has been declining for multiple decades (Phillips, 2022). In 2023, the percentage of construction workers belonging to a union fell to 10.7%, down from 11.7% in 2022 (BLS, 2024).

When observing trends by gender, apprenticeship registrations among men greatly outnumbered female registrations. The number of women registering for union programs was four times the number of women registering for non-union programs; this may be because women in union-sponsored construction apprenticeships typically earn higher wages and have a lower probability of separation (Petrucchi, 2021). It is important to monitor apprenticeships as the construction industry relies on apprenticeships for recruitment, training, as well as retention of workers through reduced turnover, higher job satisfaction, and employee engagement (Souvanna et al., 2023).

RELATED CPWR PRODUCTS

- CPWR—The Center for Construction Research and Training. [2024]. Trends of Apprenticeships in the Construction Trades. www.cpwr.com/wp-content/uploads/DataBulletin-January2024.pdf.

DEFINITIONS

- **Apprenticeship** – A career pathway where employers develop and prepare their future workforce through training and paid work experience.
 - **Active** – Registrants still in training.
- **New registration** – The number of people registering for an apprenticeship.
- **Union status** – Indicates whether the apprenticeship was union or non-union.
 - **Non-union member** – Not a union apprenticeship.
 - **Union member** – A union apprenticeship.

DATA SOURCES AND NOTES

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- Data is updated monthly. All data reported in this chapter were pulled in September 2024.

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U.S. Department of Labor (DOL). (n.d.). Apprenticeship. www.dol.gov/general/topic/training/apprenticeship.

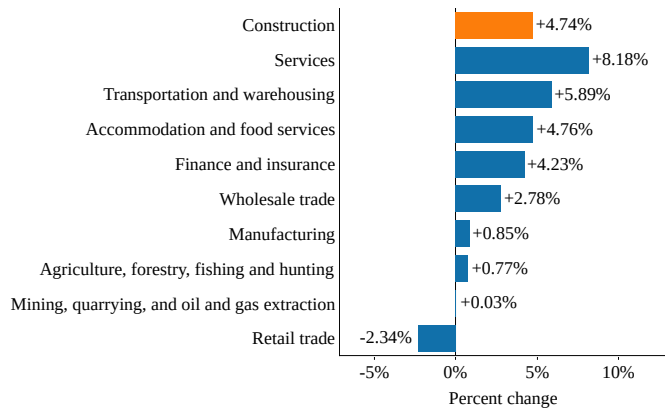
Construction Employment Projections

Employment projections serve as an important tool for understanding potential changes in the construction industry. They can inform policy development, career development, and safety training programs as new workers are projected to enter or leave specific occupations. Projections also help predict demand and highlight areas of potential improvement in hiring practices, which is particularly important now with construction's ongoing labor shortage (National Roofing Contractors Association, 2024). Although projections can be a useful tool, they may not always be correct due to changes in the economy and emerging employment opportunities (BLS, 2024). This chapter examines employment projections data pulled in 2024 from the U.S. Bureau of Labor Statistics (BLS) and Projections Central.

FINDINGS

From 2023 to 2033, employment in the construction industry is projected to grow 4.7%, while jobs in Services (professional, scientific, technical, and other services) are projected to increase 8.2% (Chart 32a). The growth in Services aligns with a worldwide trend towards service work, as by 2019 approximately 51% of jobs were in that sector (Mathieu, 2024). The construction industry's projected growth is still predicted to outpace industries it is often compared to, such as Manufacturing (+0.85%) and Mining, Quarrying, and Oil and Gas Extraction (+0.03%).

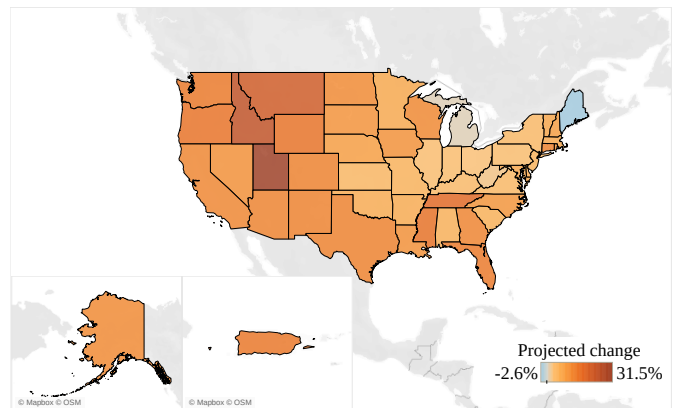
Chart 32a. Projected change in employment, by selected industry (2023-2033)



Source: U.S. Bureau of Labor Statistics, *Employment Projections Table 2.1*.

Long-term projections (2022-2032) of construction occupations by state indicated that the states with the fastest growth in employment were Utah (+31.5%), Idaho (+24.5%), and Montana (+21.6%; Chart 32b). States which already have large construction workforces were also projected to see sizable increases, including Florida (+13.9%), Texas (+12.8%), and California (+12.0%). Michigan has the slowest project growth (+0.6%), while Maine was projected to decrease over the period by -2.6%.

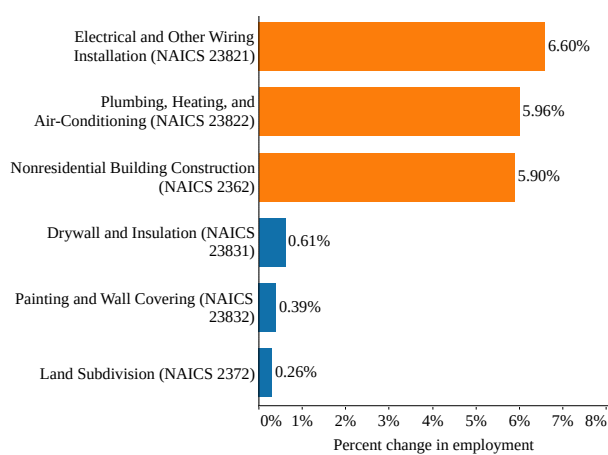
Chart 32b. Projected employment*, by state (2022-2032)



Source: Projections Central, *2022-2032 Long-Term State Employment Projections*.

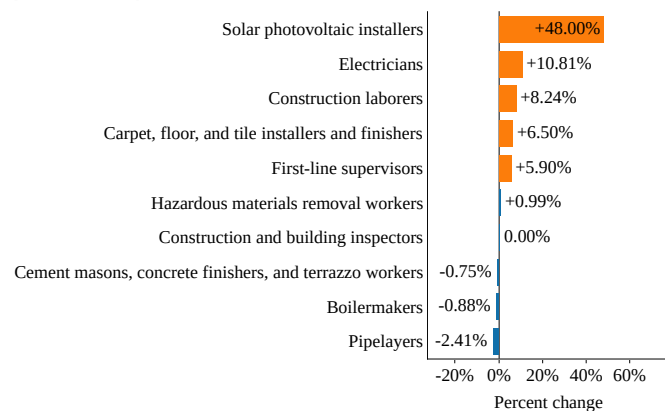
*Data shown is among construction occupations, and is not limited to construction industry alone.

Employment projections for 2023-2033 for *detailed subsectors* in construction were also examined (Chart 32c). The fastest projected growth was among Electrical and Other Wiring Installation (NAICS 23821; +6.6%) followed by Plumbing, Heating, and Air-Conditioning (NAICS 23822; +6.0%), and Nonresidential Building Construction (NAICS 2362; +5.9%). Land Subdivision (NAICS 2372; +0.26%) was the slowest growing detailed subsector in construction, with Painting and Wall Covering (NAICS 23832; +0.39%), and Drywall and Insulation (NAICS 23831; +0.61%) being the second and third slowest growing subsectors.

Chart 32c. Employment projections, by selected fastest and slowest growing detailed subsectors (2023-2033)

Source: U.S. Bureau of Labor Statistics, *Employment Projections Table 1.9*.

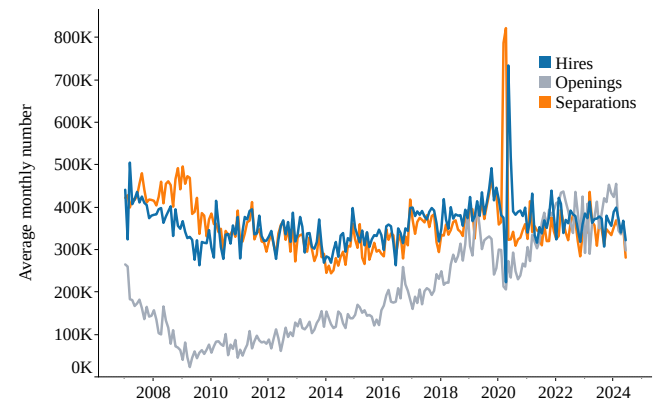
Among individual construction occupations, solar photovoltaic installers were projected to grow the fastest during 2023-2033, with an expected increase of +48.0% (Chart 32d). This rapid increase follows expected trends given recent growth in the solar industry. Electricians (+10.8%), construction laborers (+8.2%), and carpet, floor, and tile installers and finishers (+6.5%) were also among the fastest growing construction occupations (Interstate Renewable Energy Council, 2024). Decreasing occupations included Pipelayers (-2.4%), boilermakers (-0.88%), and cement masons, concrete finishers, and terrazzo workers (-0.75%).

Chart 32d. Projections, by selected occupations* (2023-2033)

Source: U.S. Bureau of Labor Statistics, *Employment Projections Table 1.10*.

*Data shown is by occupation and is not limited to construction industry alone.

Historical data on monthly *openings*, *separations*, and *hires* also reveal how the construction industry has changed over time and can help in our understanding of projections (Chart 32e). From February 2011, construction hires began to regularly outpace separations month to month, representing overall growth within the industry following recovery from the *Great Recession*. Openings in construction have risen dramatically from May 2014 to May 2024 (+207.6%; 119 thousand (K) to 366K) to reach the same level as monthly hires and separations. This is an indicator of the labor shortage in construction, showing the number of unfilled jobs month to month have increased drastically over the past 10 years (Yang, 2023).

Chart 32e. Monthly job openings, separations, and hires (January 2007-June 2024; seasonally adjusted)

Source: U.S. Bureau of Labor Statistics, *Job Openings and Labor Turnover Survey*.

TAKEAWAYS

From 2023 to 2033, construction employment is expected to grow at a steady pace (+5.4%), with slightly faster growth among detailed subsectors such as Electrical and Other Wiring Installation (NAICS 23821; +6.6%), Plumbing, Heating, and Air-Conditioning (NAICS 23822; +6.0%), and Nonresidential Building Construction (NAICS 2362; +5.9%). By occupation, solar photovoltaic installers (+48.0%) follow trends for rapid growth seen in the solar industry overall. Continuing to monitor employment trends by

state, detailed subsector, and occupation will help to evaluate the growing needs in those construction workforces, in addition to helping address safety outreach and training in those areas.

RELATED CPWR PRODUCTS

- CPWR—The Center for Construction Research and Training. [2025]. Employment Trends. [dashboard]. www.cpwrr.com/research/data-center/construction-chart-book/interactive-7th/employment-income/.

DEFINITIONS

- **Detailed subsector** – The 4/5-digit NAICS codes within construction (e.g. NAICS 2361, NAICS 23821, etc.)
- **Great Recession** – Period from 2007 to 2010 during which there was a decline in the global economy.
- **Openings** – The sum of net occupational employment change and occupational separations. Workers who change jobs within an occupation do not generate openings since there is no net change in openings from this movement.
- **Separations** – The sum of labor force exits and occupational transfers.
 - **Labor force exits** – Workers who are leaving an occupation or exiting the labor force entirely.
 - **Occupational transfers** – Workers who transfer to a different occupation. These represent permanent separations, not temporary movements where a worker is expected to return to the same occupation in the future.

DATA SOURCES AND NOTES

Projections Central. (2024). State Employment Projections projectionscentral.org/home:

- Short-Term Projections 2023-2025 projectionscentral.org/shortterm.
- Long-Term Projections 2022-2032 projectionscentral.org/longterm.
- Data for long and short-term projections are unavailable for Hawaii due to lack of compatible state projections data.

U.S. Bureau of Labor Statistics. (2024). Employment Projections Tables:

- 1.9, 2023-33 Industry-occupation matrix data, by industry www.bls.gov/emp/tables/industry-occupation-matrix-industry.htm.
- 1.10, 2023-33 Occupational separations and openings, projected 2023-33 www.bls.gov/emp/tables/occupational-separations-and-openings.htm.
 - Occupational separations and openings are not available by specific industry, and as a result are not limited to Construction (NAICS 23) alone.
- 2.1, Employment by major industry sector www.bls.gov/emp/tables/employment-by-major-industry-sector.htm.

U. S. Bureau of Labor Statistics (BLS). (2024). Job Openings and Labor Turnover Survey (JOLTS). www.bls.gov/jlt/data.htm.

- Openings, new hires, and separations estimates are all seasonally adjusted.

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Yang, M. (2023, April 6). Where did the workers go? Construction jobs are plentiful, but workers are scarce. NPR News. www.npr.org/2023/04/06/1158576556/where-did-the-workers-go-construction-jobs-are-plentiful-but-workers-are-scarce.

O*NET Reported Occupational Exposures and Hazards in Construction

Construction workers are more likely than workers in almost any other industry to face occupational exposure to hazards such as unsafe working conditions, dangerous equipment, and harmful contaminants (CPWR, 2022; Gislason, 2024). The resulting injuries and illnesses often dramatically affect workers' lives and result in billions of dollars in costs annually for the industry worldwide.

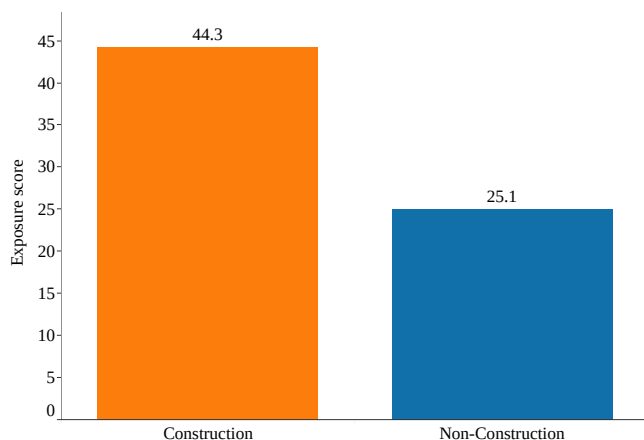
In addition to sudden occupational incidents that cause severe injuries, millions of construction workers suffer long-term health impairments after prolonged exposure to hazards on the job (Sinyai & Choi, 2020). For example, some are chronically exposed to dust containing crystalline silica, known carcinogens associated with respiratory diseases such as silicosis and lung cancer (Tavakol et al., 2017).

This chapter examines occupational exposures with data from the Occupational Information Network (O*NET) database, which contains statistics on workplace conditions and hazards for almost 1,000 occupations in the U.S. economy (CPWR, 2022). *Exposure scores* are used to measure the risk of hazardous exposure in different occupations

FINDINGS

First, exposures to hazardous conditions, hazardous equipment, and contaminants were examined for construction and all industries (Charts 33a – 33c). In 2023, *construction* had an average exposure score of 44.3, compared to 25.1 for non-construction industries, indicating that construction workers are more likely to encounter hazardous conditions (Chart 33a). Examples of hazardous conditions include working in areas with wet surfaces, unstable or broken support structures, or high electrical voltage.

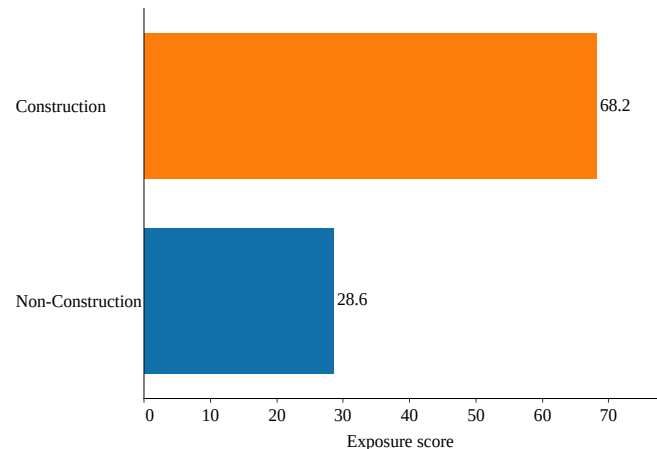
Chart 33a. Level of occupational exposure to hazardous conditions, by industry (2024)



Source: 2024 O*NET OnLine database.

Construction workers were also more likely to work with hazardous equipment than workers in non-construction industries (68.2 versus 28.6; Chart 33b). Construction workers often use heavy equipment like trucks, bulldozers, excavators, forklifts, and cranes (Woods, 2024).

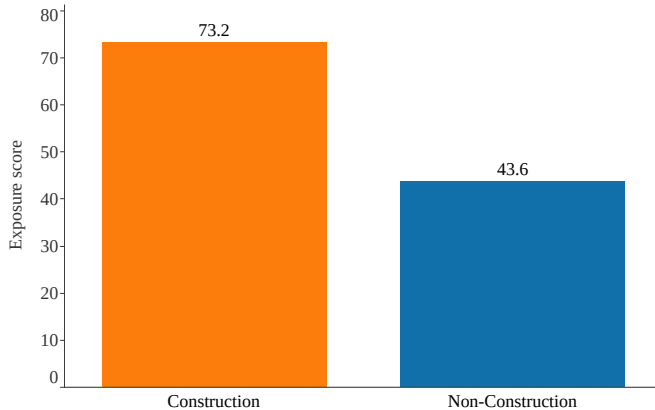
Chart 33b. Level of occupational exposure to hazardous equipment, by industry (2024)



Source: 2024 O*NET OnLine database.

In 2023, construction workers were more likely to be exposed to harmful contaminants than the average worker across all other industries, with an average exposure score of 73.2 compared to 43.6 (Chart 33c). The average construction worker was exposed to contaminants at least once a month, while the average worker in all other industries reported exposure once a year, but not every month.

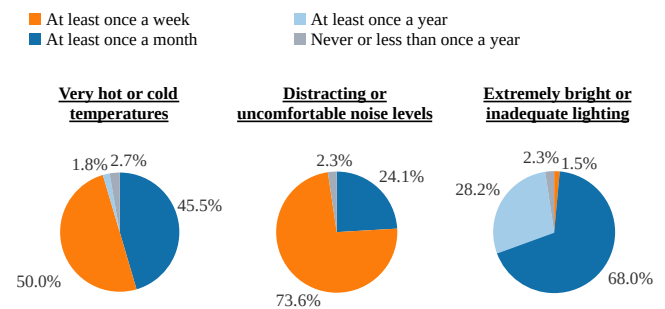
Chart 33c. Level of occupational exposure to contaminants, by industry (2024)



Source: 2024 O*NET OnLine database.

Exposures to extreme temperatures, distracting or uncomfortable noise, and bright or inadequate lighting were examined for construction (Chart 33d). Half (50.0%) of construction workers are exposed to very hot or cold temperatures at least once a week, while 45.5% face exposure at least once a month. Nearly three-quarters (73.6%) of all construction workers are exposed to distracting or uncomfortable noise levels at least once a week, while 24.1% are exposed at least once a month. Meanwhile, 68.0% are exposed to extremely bright or inadequate lighting on the job at least once a month, with 1.5% experiencing it at least once a week.

Chart 33d. Construction workers reported levels of occupational exposure to select hazards (2024)



Source: 2024 O*NET OnLine database and U.S. Bureau of Labor Statistics, Occupational Employment and Wage Statistics.

TAKEAWAYS

A construction job site remains one of the most hazardous work environments. Construction workers are frequently in areas with dangerous conditions, machinery, and contaminants, increasing their susceptibility to serious injury or illness.

Not only do construction workers have this increased risk, but they are also likely to experience reductions in their quality of life due to regular exposure to hazards. For example, excessive noise at a jobsite can lead to hearing difficulties and tinnitus (NIOSH, 2024), while persistent exposure to airborne contaminants may result in reduced lung capacity and restricted breathing (Cruel, 2023). Due to the potential for severe injury or disease, occupational hazards in construction should be continuously monitored.

RELATED CPWR PRODUCTS

- CPWR–The Center for Construction Research and Training. [2025]. O*NET Occupational Exposures in Construction. [dashboard]. cpwr.com/research/data-center/construction-chart-book/interactive-7th/hazards-and-exposures/.
 - This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by exposure.

DEFINITIONS

- **Construction** – Defined as occupations in which 50% or more of employees reported work under North American Industry Classification System (NAICS) 23 (Construction) for private industry employment. Occupations are reported by their Standard Occupation Classification (SOC) code.
 - The percentage of workers is an estimate of the workforce that is exposed to selected exposures. Calculated as the total number of construction workers exposed/total number of construction workers for occupations in which more than half of the workers were classified under construction (NAICS 23).
- **Exposure score** – Indicates the frequency of exposure. See charts for specific categories used.

DATA SOURCES AND NOTES

2024 O*NET OnLine Database. www.onetonline.org/.

- Data is collected using analysis cycles, so all occupations are not updated annually. Dates of occupation updates can be found online at www.onetcenter.org/taxonomy/2019/updated.htm.
- Data is collected at the occupation level. Industry is determined if a majority of workers in the occupation fall into construction. This does not follow other construction industry definitions used throughout the Chart Book.

U.S. Bureau of Labor Statistics (BLS). (2025). Occupational Employment and Wage Statistics May 2023 All Data. www.bls.gov/oes/tables.htm.

- Construction defined as occupations with more than 50% of the workers employed under NAICS 23 for private industry estimates.

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CPWR–The Center for Construction Research and Training. (2025). Occupational Exposures in Construction. [dashboard]. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/hazards-and-exposures/.

Cruel, S. (2023). Construction workers at Increased Risk for Life-Threatening Lung Disease, Study Finds. Duke University School of Medicine. fmch.duke.edu/news/construction-workers-increased-risk-life-threatening-lung-disease-study-finds.

Gislason, E. (2024). Common Safety Challenges in the Construction Industry. National Association of Safety Professionals (NASP). www.naspweb.com/blog/common-safety-challenges-in-the-construction-industry/.

National Institute for Occupational Safety and Health (NIOSH). (2024). Construction Statistics. www.cdc.gov/niosh/noise/surveillance/construction.html.

Sinyai, C., & Choi, S. (2020). Fifteen Years of American Construction Occupational Safety and Health Research. Safety Science, 131, 104915. doi.org/10.1016/j.ssci.2020.104915.

Tavakol, E., Azari, M., Zendehtdel, R., Salehpour, S., Khodakrim, S., Nikoo, S., & Saranjam, B. (2017). Risk Evaluation of Construction Workers' Exposure to Silica Dust and the Possible Lung Function Impairments. Tanaffos, 16(4), 295–303. pmc.ncbi.nlm.nih.gov/articles/PMC5971761/pdf/Tanaffos-16-295.pdf.

Woods, C. (2024). Full Guide to Construction Equipment. Boom & Bucket. www.boomandbucket.com/blog/full-guide-to-construction-equipment.

O*NET Reported Exposure Risks for Musculoskeletal Disorders and Related Injuries/Illnesses

Construction workers are at an increased risk of *musculoskeletal disorders (MSDs)* and related injuries/illnesses due to the nature of their work, which includes overexertion, manual material handling, awkward postures, repetitive movements, and whole-body vibrations (NSC, 2024). Dong et al. (2020) found that over a third of construction workers (34%) reported having at least one MSD symptom, and from 2021 to 2022, almost a quarter (23%) of nonfatal injuries resulting in *days away from work* were due to MSDs (BLS, n.d.).

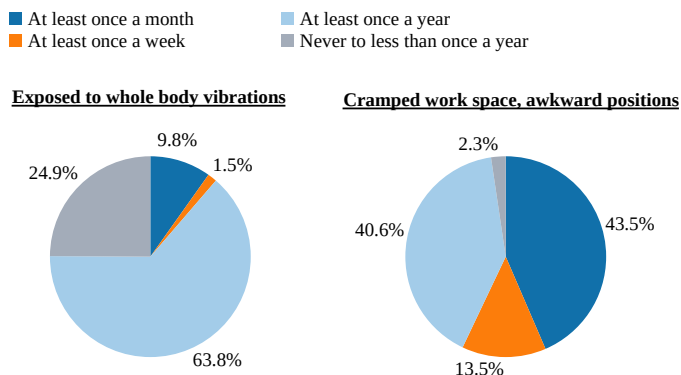
Another concern related to MSDs is the potential risk of opioid use to manage symptoms. Dong et al. (2020) found that construction workers with MSDs were three times more likely to use prescription opioids than those without MSDs. Opioid use is of particular concern as the construction industry has been found to have the highest overdose rate among those 16 to 64 years old (Billock, Steege, & Miniño, 2023).

This chapter used occupational exposure data from the Occupational Information Network (O*NET) database to examine reported musculoskeletal exposure risks. O*NET *exposure scores* assess the level of exposure for a variety of body positioning risk factors that could lead to MSDs such as whole body vibrations, cramped workspaces, bending or twisting, and making repetitive motions.

FINDINGS

Construction workers' reported levels of exposure to whole-body vibrations and cramped workspaces were analyzed first (Chart 34a). Overall, 75.1% of construction workers examined were in occupations exposed to whole body vibrations, with 1.5% being exposed to these vibrations at least once a week. While almost all (97.7%) worked in cramped work spaces, awkward positions at least once a year, with 13.5% being exposed at least once a week.

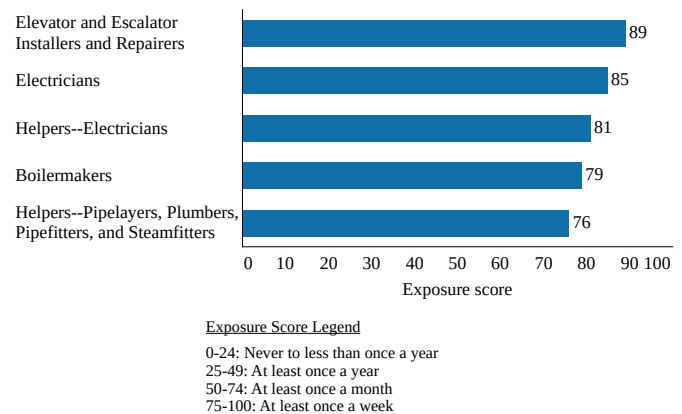
Chart 34a. Construction workers' reported levels of occupational exposure to whole body vibrations and cramped work spaces (2024)



Source: 2024 O*NET OnLine database and U.S. Bureau of Labor Statistics, Occupational Employment and Wage Statistics.

The construction occupation with the highest exposure score for cramped work space/awkward position were elevator and escalator installers and repairers, who were exposed at least once a week (exposure score: 89; Chart 34b). Electricians had the next highest score (85), indicating they were also exposed at least once a week.

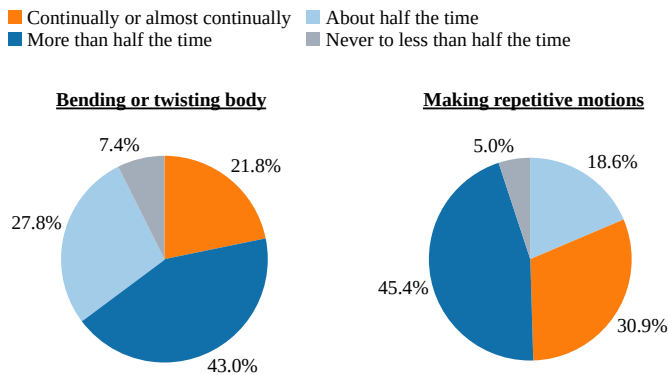
Chart 34b. Occupations with the highest exposure score for being exposed to a cramped work space, awkward positions (2024)



Source: 2024 O*NET OnLine database.

Next, construction workers were examined for bending/twisting and making repetitive motions (Chart 34c). Overall, 92.6% of them worked in occupations that involved bending or twisting at least about half of the time, with 21.8% doing so continually or almost continually. More than 9 out of 10 construction workers examined were in occupations that make repetitive motions at least about half of the time, with over a quarter (30.9%) doing so continually or almost continually.

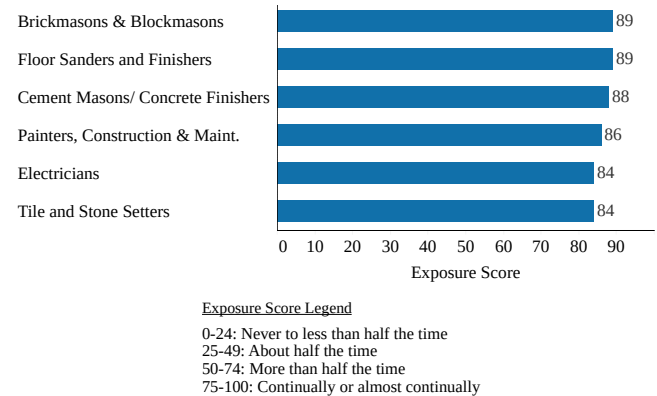
Chart 34c. Construction workers' reported levels of occupational exposure to bending/twisting and making repetitive motions (2024)



Source: 2024 O*NET OnLine database and U.S. Bureau of Labor Statistics, Occupational Employment and Wage Statistics.

Among the construction occupations with the highest exposure score for repetitive motions, brickmasons/blockmasons and floor sanders/finishers tied for the top score, indicating they were continually or almost continually exposed (89; Chart 34d). The next highest exposure score for repetitive motions were cement and concrete masons (88), showing they too were also continually or almost continually exposed.

Chart 34d. Top occupations with the highest exposure score for repetitive motions at work (2024)



Source: 2024 O*NET OnLine database.

TAKEAWAYS

As MSDs continue to account for a large portion of nonfatal injuries experienced by construction workers and the industry continues to have one of the highest overdose rates, it remains important to understand potential MSDs exposure risks. MSDs can be prevented through identifying and addressing ergonomic concerns, as well as training (OSHA, n.d.).

RELATED CPWR PRODUCTS

- CPWR–The Center for Construction Research and Training. [n.d.]. Best Built Plans. cpwr.com/research/research-to-practice-r2p/r2p-library/other-resources-for-stakeholders/best-built-plans/.
- CPWR–The Center for Construction Research and Training. [n.d.]. Resources to Prevent Opioid Deaths in Construction. cpwr.com/research/research-to-practice-r2p/r2p-library/other-resources-for-stakeholders/mental-health-addiction/opioid-resources/.
- CPWR–The Center for Construction Research and Training. [2025]. Musculoskeletal Disorders (MSDs) in Construction. [dashboard]. cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/injuries-illnesses-health/.
- CPWR–The Center for Construction Research and Training. [2025]. O*NET Occupational Exposures. [dashboard]. cpwr.com/research/data-center/construction-chart-book/interactive-7th/hazards-and-exposures/.
 - This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by exposure.

DEFINITIONS

- **Construction** – Defined as occupations in which 50% or more of employees reported work under North American Industry Classification System (NAICS) 23 (Construction) for private industry employment. Occupations are reported by their Standard Occupation Classification (SOC) code.
 - The percentage of workers is an estimate of the workforce that is exposed to selected exposures. Calculated as the total number of construction workers exposed/total number of construction workers for occupations in which more than half of the workers were classified under construction (NAICS 23).
- **Days away from work (DAFW)** – Nonfatal injury cases resulting in at least one day away from work beyond the day of injury or illness onset.
- **Exposure score** – Indicates the frequency of exposure. See charts for specific categories used.
- **Musculoskeletal disorders (MSDs)** – Affect muscles, nerves, blood vessels, ligaments, and tendons, such as carpal tunnel syndrome, tendinitis, muscle strains, and back injuries.

DATA SOURCES AND NOTES

2024 O*NET OnLine Database. www.onetonline.org/.

- Data is collected using analysis cycles, so all occupations are not updated annually. Dates of occupation updates can be found online at www.onetcenter.org/taxonomy/2019/updated.htm.
- Data is collected at the occupation level. Industry is determined if a majority of workers in the occupation fall into construction. This does not follow other construction industry definitions used throughout the Chart Book.

U.S. Bureau of Labor Statistics (BLS). (2025). Occupational Employment and Wage Statistics May 2023 All Data.

www.bls.gov/oes/tables.htm.

- Construction defined as occupations with more than 50% of the workers employed under NAICS 23 for private industry estimates.

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Dong, X. S., Brooks, R. D., & Brown, S. (2020). Musculoskeletal disorders and prescription opioid use among US construction workers. *Journal of Occupational and Environmental Medicine*, 62(11), 973-979.

National Safety Council (NSC). (2024). Industry Spotlight: Construction Purposeful interventions can prevent work-related musculoskeletal disorders (MSDs). www.nsc.org/getmedia/42d4a072-3604-4072-877b-63b57a2453fe/msd-industry-spotlight-construction.pdf.

Occupational Safety and Health Administration (OSHA). (n.d.). Ergonomics. www.osha.gov/ergonomics.

U.S. Bureau of Labor Statistics (BLS). (n.d.). 2021-2022 Survey of Occupational Injuries and Illnesses (SOII). www.bls.gov/iif/.

Nanomaterials in Construction

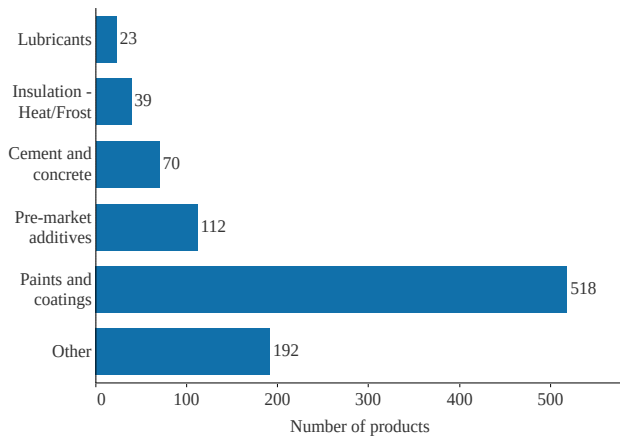
Nanomaterials are small particles between 1 and 100 nanometers in diameter; a sheet of paper is 100,000 nanometers thick (National Nanotechnology Initiative, n.d.). They are used with increasing frequency in construction products to make those supplies lighter, stronger, more insulating, and/or more wear-resistant (West et al., 2016). However, some nanomaterials also pose potential health risks to the workers using them or near them. NIOSH offers a variety of nanotechnology health and safety resources, including occupational exposure limits and summaries of critical health effects studies (NIOSH, 2024b).

From 2014 to 2025, CPWR collected information on *nano-enabled products* via the [eLCOSH Nano Construction Nanomaterial Inventory](#), tracking their use in construction and the trades that may be exposed to them (CPWR, n.d.). Research indicates that some nanoparticle exposures may be hazardous and that these exposures can be measured and controlled through traditional measures (NIOSH, 2024a). When used properly, NIOSH-certified respiratory protection labeled as N100, R100, and P100 will protect the wearer from airborne nanoparticles at more than 99.97% efficiency. Similarly, engineering controls like local exhaust ventilation with a HEPA filter will effectively capture nanoparticles in the air.

FINDINGS

From September 2014 to December 2024, the eLCOSH Inventory catalogued 954 nano-enabled products (Chart 35a). Among them, the three most common categories of products are paints and coatings (n=518; 54.3%), *pre-market additives* (n=112; 11.7%), and cement and concrete (n=70; 7.3%).

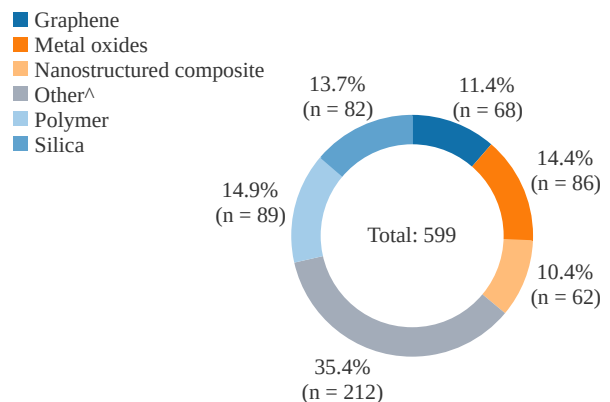
Chart 35a. Number of nanomaterial products, by trade (2024)



Source: eLCOSH Nano, Construction Nanomaterial Inventory.

Only 62.8% (n=599) of nano-enabled products in the Nano Inventory identify the specific nanomaterial used (Chart 35b). Among the most common nanomaterials in these products were polymers (n=89; 14.9%), various forms of silica (n=82; 13.7%), and graphene (n=68; 11.4%). Respirable crystalline silica is of special concern due to its role in causing silicosis, a chronic, incurable, and potentially fatal lung disease (American Lung Association 2025).

Chart 35b. Number of products, by nanomaterial* (2024)



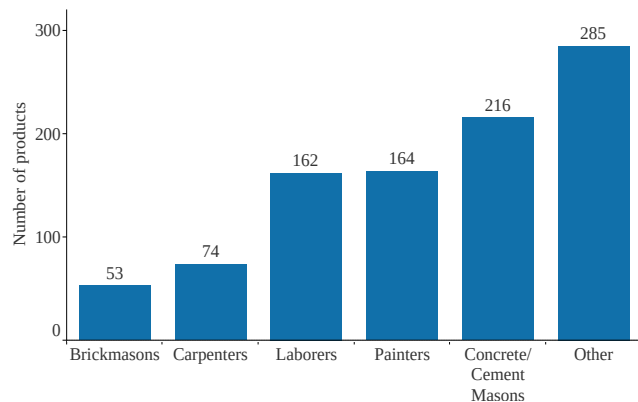
Source: eLCOSH Nano, Construction Nanomaterial Inventory.

*Nanomaterials with an undetermined chemistry are excluded from this chart.

^Email datacenter@cpwr.com for a list of nanomaterials included in the Other category.

Each product in the database was assigned a trade that would be most likely to use it (Chart 35c). While most products can be used by multiple trades, linking each product to a primary trade highlights workers who may have a greater likelihood of nanomaterial exposure. The trades with the most associated products were concrete/cement masons (n=216; 22.6%), painters (n=164; 17.2%), and laborers (n=162; 17.0%). Together, those three accounted for more than half (56.8%) of products in the database.

Chart 35c. Number of nanomaterial products, by trade (2024)

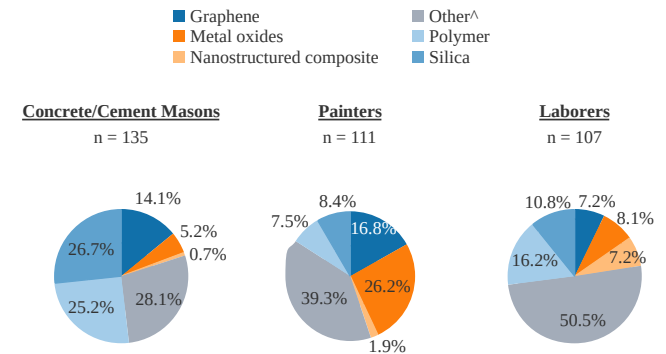


Source: eLCOSH Nano, Construction Nanomaterial Inventory.

*A primary trade was assigned to each product, but it is important to note that products can be handled by multiple trades.

For concrete and cement masons, the most common nanomaterials identified were silica (n=36; 26.7%), polymers (n=34; 25.2%) and graphene (n=19; 14.1%; Chart 34d). For painters, the most common nanomaterials were metal oxides (n=28; 26.2%), graphene (n=18; 16.8%), and silica (n=9; 8.4%). For laborers, polymers (n=18; 16.2%), silica (n=12; 10.8%) and graphene (n=8; 7.2%) were the most commonly identified.

Chart 35d. Most common nanomaterial products for the top three trades* (2024)



Source: eLCOSH Nano, Construction Nanomaterial Inventory.

*Top three based on number of products in eLCOSH Nano.

^Email datacenter@cpwr.com for a list of nanomaterials included in the Other category.

TAKEAWAYS

While the eLCOSH Nano Construction Nanomaterial Inventory does not contain a complete list of all nano-enabled products, it provides information on nearly 1,000 products and the trades that use them, giving construction workers a better idea of their potential exposures. As products with nanomaterials continue to become more common in construction, monitoring their applications enables better hazard communication. This protects the health and safety of construction workers as well as the people who live and work in the buildings they create (Kumah et al. 2023).

RELATED CPWR PRODUCTS

- CPWR—The Center for Construction Research and Training. [n.d]. eLCOSH NANO Construction Nanomaterial Inventory. cpwr.com/nano/.
- CPWR—The Center for Construction Research and Training. [2024]. Nanomaterials in Construction. [dashboard]. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/historical-data-dashboards/nanomaterials/.

DEFINITIONS

- Nano-enabled products** – Products with properties made possible by nanotechnology.
- Pre-market additives** – Chemical substances designed for use in construction prior to being added to end-user products like concrete or asphalt.

DATA SOURCES AND NOTES

CPWR–The Center for Construction Research and Training. (n.d.). elcosh NANO, Construction Nanomaterial Inventory. nano.elcosh.org/.

REFERENCES

CPWR–The Center for Construction Research and Training. (n.d.). elcosh NANO, Construction Nanomaterial Inventory. nano.elcosh.org/.

Kumah, E.A., Fopa, R.D., Harati, S. et al. Human and environmental impacts of nanoparticles: a scoping review of the current literature. BMC Public Health 23, 1059 (2023). doi.org/10.1186/s12889-023-15958-4.

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National Institute for Occupational Safety and Health (NIOSH). (2024b). Nanotechnology Guidance and Publications. www.cdc.gov/niosh/nano/guidance/index.html.

West, G. H., Lippy, B. E., Cooper, M. R., Marsick, D., Burrelli, L. G., Griffin, K. N., & Segrave, A. M. (2016). Toward responsible development and effective risk management of nano-enabled products in the US construction industry. Journal of nanoparticle research, 18, 1-27. doi.org/10.1007/s11051-016-3352-y.

Lead Exposure in the Construction Industry

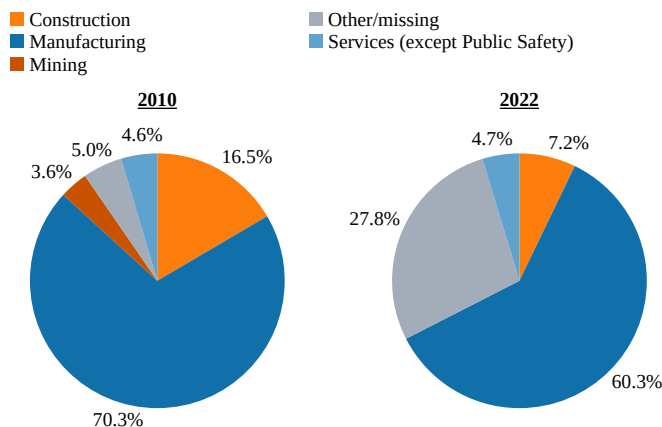
Exposure to lead can cause adverse health effects, including memory loss, high blood pressure, bone loss, fertility issues, and decreased lung function (NIOSH, 2024b). Construction workers are at an increased risk of lead exposure through tasks that generate fumes and respirable dust, such as demolition, welding, soldering, and mortar work. In addition, construction workers' families and children can be at increased risk of exposure due to take-home exposures (Colarossi, 2019).

The National Institute for Occupational Safety and Health's (NIOSH) Adult Blood Lead Epidemiology and Surveillance (ABLES) Program has worked on reducing elevated blood lead levels among working adults 16 years and older (NIOSH, 2012). ABLES collects lead exposure data from participating states, as well as works with states to prevent work-related lead exposures. This chapter examines exposure among construction workers using publicly available NIOSH ABLES data (NIOSH, 2024a).

FINDINGS

Elevated blood lead levels (BLL), cases with $BLL > 25 \mu\text{g/dL}$, were examined by industry (Chart 36a). Between 2010 and 2022, the percentage of these cases among construction workers decreased 56.4%, from 16.5% to 7.2% of workers. In both years examined, the construction industry accounted for the second largest percentage of elevated BLL cases. It is important to note that the percentage of elevated BLL cases found in other or missing industries increased dramatically, from 5.0% to 27.8% of cases.

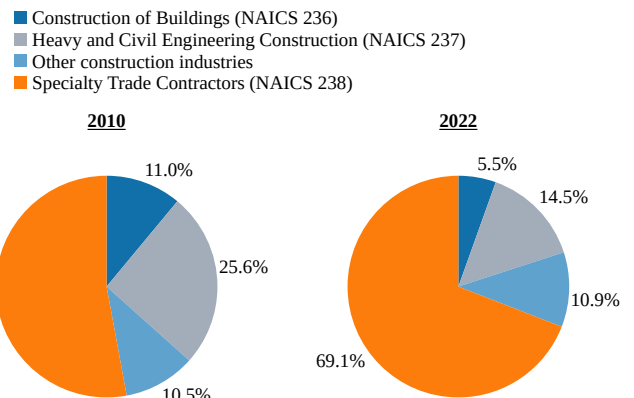
Chart 36a. Cases of elevated blood lead levels, by industry (2010 versus 2022)



Source: NIOSH, *Trends in Workplace Lead Exposure*.

A majority of elevated BLL cases among construction workers in 2022 occurred among those employed by Specialty Trade Contractors (NAICS 238; 69.1%; Chart 36b). From 2010 to 2022, Specialty Trade Contractors share of elevated BLL cases increased 30.6% (52.9% to 69.1%). During the same period, Construction of Buildings (NAICS 236) went from 11.0% to 5.5% of cases and among workers in Heavy and Civil Engineering (NAICS 237), from 25.6% to 14.5%.

Chart 36b. Percent of elevated blood lead levels among construction workers, by major subsector (2010 versus 2022)



Source: NIOSH, *Trends in Workplace Lead Exposure*.

TAKEAWAYS

While construction workers have accounted for a decreasing share of elevated BLL cases, the industry still has the second highest percentage of cases, and more work is needed to reduce work-related lead exposures.

To prevent lead exposure, workers should never blast, sand, or cut any surfaces that may contain lead until tested (CPWR, 2017). If positive for lead, engineering controls (e.g., vacuum attachments) and appropriate personal protective equipment (PPE) should be used (CPWR, 2017).

RELATED CPWR PRODUCTS

- CPWR–The Center for Construction Research and Training. [2025]. O*NET Occupational Exposures in Construction. [dashboard]. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/hazards-and-exposures/.
- CPWR–The Center for Construction Research and Training. [2025]. OSHA Citations for Exposures. [dashboard]. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/other-topics/.

DEFINITIONS

- **Elevated blood lead levels (BLL)** – Cases with $BLL > 25 \mu\text{g/dL}$.

DATA SOURCES AND NOTES

National Institute for Occupational Safety and Health (NIOSH). (2024). Trends in Workplace Lead Exposure. www.cdc.gov/niosh/lead/data/index.html.

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Colarossi, J. (2019, December 17). Children of Construction Workers Are at Risk of Secondhand Lead Exposure. www.bu.edu/sph/news/articles/2019/children-of-construction-workers-are-at-risk-of-secondhand-lead-exposure/.

CPWR–The Center for Construction Research and Training. (2017). Lead Exposure Toolbox Talk. www.cpwr.com/wp-content/uploads/TT-Lead_Exposure.pdf.

National Institute for Occupational Safety and Health (NIOSH). (2012, July). Data into action. NIOSH blood lead surveillance program contributes to a decline in national prevalence rates. www.cdc.gov/niosh/docs/2012-164/default.html.

National Institute for Occupational Safety and Health (NIOSH). (2024a). Trends in Workplace Lead Exposure. www.cdc.gov/niosh/lead/data/index.html.

National Institute for Occupational Safety and Health (NIOSH). (2024b, April 11). Symptoms of Lead Exposure. www.cdc.gov/niosh/lead/signs-symptoms/index.html.

Fatal and Nonfatal Injuries in Selected Countries

Construction is one of the most dangerous industries for workers across the globe, including having the highest fatality rate for several decades (Shim et al., 2022). As the number of construction injuries have increased in the U.S., European countries such as France, Spain, Sweden, and Germany also have experienced a rise in construction fatalities (BLS, 2024; HSI Staff, 2024). This chapter examines fatal and nonfatal injuries in select countries.

FINDINGS

To examine these increases, data about construction *occupational injuries* for industrial countries in North America, Europe, and Australia in 2020 were examined from the International Labour Organization statistics database (ILOSTAT; International Labour Organization, n.d.). Participating countries report data through a variety of sources (e.g., administrative, insurance, surveys) and on different types of injuries (e.g., *compensated, reported*; Table 37a). Due to the variability in data collection and reporting, comparisons across countries must be made with caution.

Table 37a. Source and type of injury collected by country

Country	Reference Group	Injury Type	Source
Australia*	Employees	Compensated	Administrative
Belgium	Insured	Reported	Insurance
Canada	Insured	Compensated	Administrative
Finland	Insured	Reported	Administrative
France	Employees	Compensated	Insurance
Germany	Insured	Reported	Insurance
Spain	Insured	Reported	Insurance
Sweden	Insured	Reported	Administrative
Switzerland	Employees	Reported	Administrative
United Kingdom	Employees	Reported	Insurance
United States^	Employees	Reported	Survey

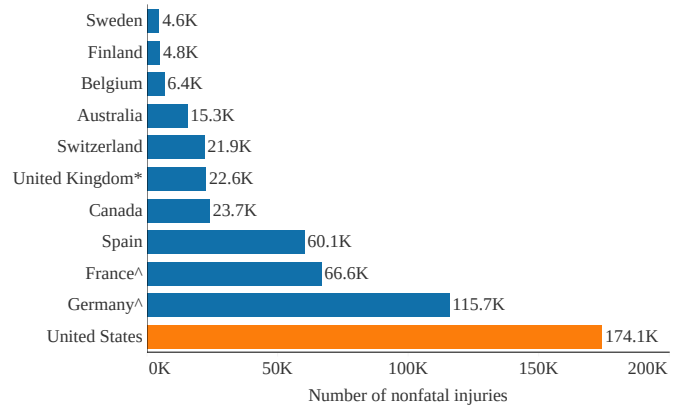
Source: International Labour Organization, 2018-2020 ILOSTAT-ILO database of labour statistics.

*Collects nonfatal data from AIHW National Data Standards for Injury Surveillance Records and fatal data from SWA Work-related Traumatic Injury Fatalities Records.

^Collects nonfatal data from BLS Survey of Occupational Injuries and Illnesses and fatal data from BLS Census of Fatal Occupational Injuries.

The U.S. reported over 174.1 thousand (K) nonfatal occupational injuries in construction in 2020, which was 1.5 times greater than the 115.7K reported in Germany, the highest figure among the selected industrial countries in Europe (Chart 37a). Following Germany, Spain (66.6K) and France (60.1K) reported the next highest number of injuries. The lowest number of nonfatal injuries were reported in Sweden (4.6K) and Finland (4.8K).

Chart 37a. Nonfatal injuries, by selected countries (2020)



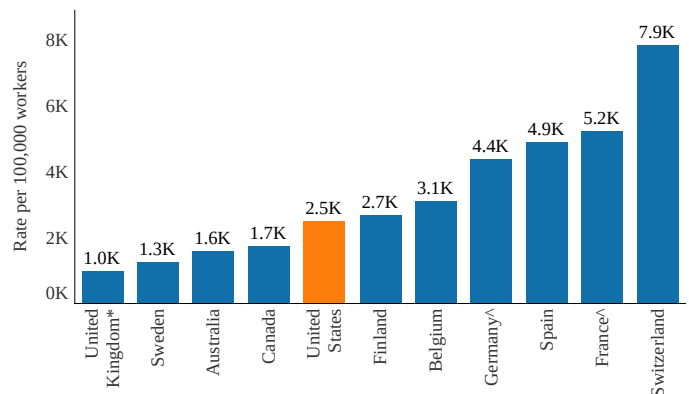
Source: International Labour Organization, 2018-2020 ILOSTAT-ILO database of labour statistics.

*Collected from 2018 due to missing data in 2020.

^Contains private sector data only.

Among selected countries examined, Switzerland reported the highest nonfatal injury rate—7.9K per 100,000 workers—which was 3.2 times greater than the rate in the U.S. (2.5K per 100,000 workers; Chart 37b). France reported the second highest rate (5.2K per 100,000 workers), with Spain the third highest (4.9K per 100,000 workers).

Chart 37b. Nonfatal injury rates, by selected countries (2020)



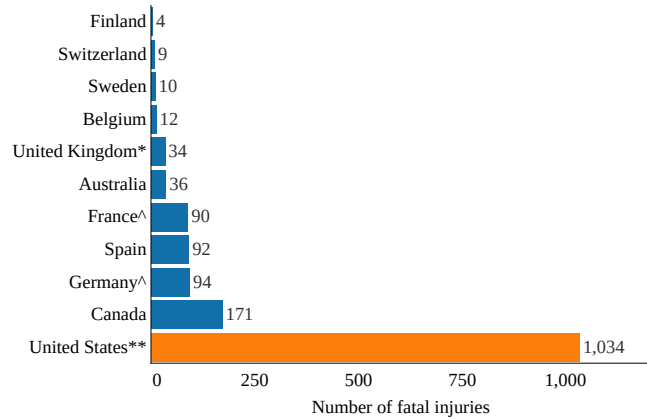
Source: International Labour Organization, 2018-2020 ILOSTAT-ILO database of labour statistics.

*Collected from 2018 due to missing data in 2020.

^Contains data from the private sector only.

The U.S. reported the highest number of construction fatalities in 2020 with 1,034, or 65.2% of the total fatalities among the selected countries (Chart 37c). The figure for U.S. was 1.9 times greater than the rest of the countries combined. Canada reported the second highest total with 171 fatalities, while Finland reported the lowest with 4 fatalities. Among European countries, Germany had the highest number of fatalities at 94.

Chart 37c. Fatal injuries, by selected countries (2020)



Source: International Labour Organization, 2018-2020 ILOSTAT-ILO database of labour statistics and U.S. Bureau of Labor Statistics, 2020 Census of Fatal Occupational Injuries.

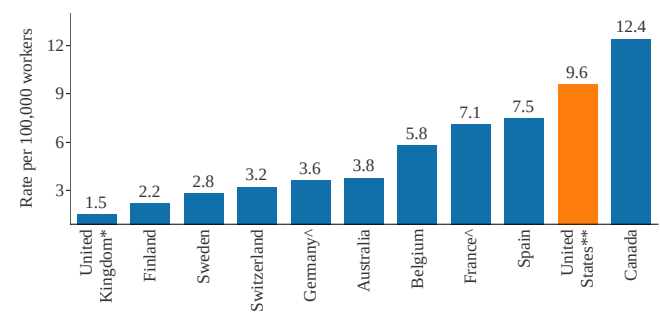
*Collected from 2018 due to missing data in 2020.

^Contains private sector data only.

**Data unavailable in ILOSTAT, pulled from BLS Census of Fatal Occupational Injuries.

Canada had the highest fatality rate in construction, 12.4 per 100,000 workers (Chart 37d). The U.S. reported the second highest rate (9.6 per 100,000 workers), while Spain had the third highest (7.5 per 100,000 workers). Canada's fatal injury rate was 1.3 times higher than the rate in U.S. and 1.7 times higher than the rate in Spain.

Chart 37d. Fatal construction injury rates, by selected countries (2020)



Source: International Labour Organization, 2018-2020 ILOSTAT-ILO database of labour statistics and U.S. Bureau of Labor Statistics, 2020 Census of Fatal Occupational Injuries.

*Collected from 2018 due to missing data in 2020.

^Contains private sector data only.

**Data unavailable in ILOSTAT, pulled from BLS Census of Fatal Occupational Injuries.

TAKEAWAYS

Despite the variability in data sources and reporting, examining construction worker injuries in select countries provides information on potential global trends, as well as perspective for the U.S. construction industry. The U.S. continues to lead in the number of both nonfatal and fatal construction injuries, at least in part due to the size of the construction workforce. For example, it reported 9.0 million construction workers in 2012, while Germany had only 2.0 million (Building Radar, n.d.; Brown et al., 2022). European countries reported higher nonfatal injury rates than the U.S., but that may be the result of underreporting of nonfatal injuries in the U.S. (BLS, 2020). Canada and the U.S. reported the two highest fatal injury rates.

Because of the variety of national sources reporting occupational injuries, there are limitations to conducting a comparative analysis of the data. Despite these differences, it is important to monitor industry injury trends across countries as this can provide valuable information. Underreporting is also an issue, since employers may not report all injuries resulting in compensation (International Labour Organization, 2020).

RELATED CPWR PRODUCTS

- CPWR–The Center for Construction Research and Training. [2025]. Fatal and Nonfatal Injuries by Industrial Country. [dashboard]. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/injuries-illnesses-health/.
 - This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by year and injury type.

DEFINITIONS

- **Compensated injury** – An injury resulting in a worker claiming and receiving compensation, such as workers compensation (International Labour Organization, 2020).
- **Occupational injury** – Any personal injury, disease, or death resulting from an occupational accident (International Labour Organization, 2020).
- **Reported injury** – Records of the corresponding system of notification of occupational accidents by the employers, the workers, or a labor inspector to the competent authority (International Labour Organization, 2020).

DATA SOURCES AND NOTES

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Shim, Y., Jeong, J., Jeong, J., Lee, J., & Kim, Y. (2022). Comparative Analysis of the National Fatality Rate in Construction Industry Using Time-Series Approach and Equivalent Evaluation Conditions. International Journal of Environmental Research and Public Health. 19, no. 4, 2312. doi.org/10.3390/ijerph19042312.

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U.S. Bureau of Labor Statistics (BLS). (2020). Handbook of Methods. www.bls.gov/opub/hom/soii/pdf/soii.pdf.

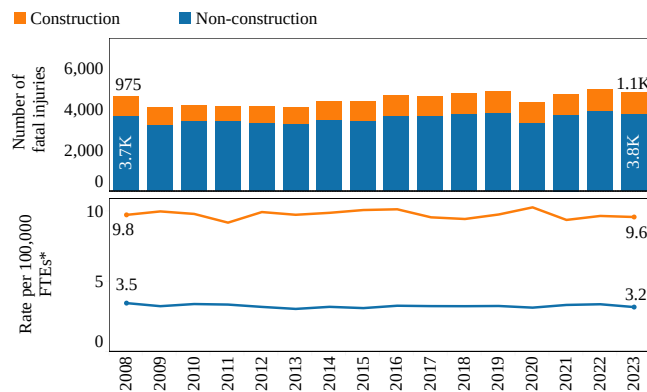
Fatal and Nonfatal Injuries by Industry

Construction continues to be one of the most dangerous industries in the United States. In 2023, it had the highest number of fatal injuries (n=1,075; BLS, n.d.) and the third highest rate of fatalities, 9.6 per 100,000 *full-time equivalents (FTEs)* (BLS, n.d.). This chapter compares fatal and nonfatal injuries by industry as reported in the Census of Fatal Occupational Injuries (CFOI) and Survey of Occupational Injuries and Illnesses (SOII) published by the U.S. Bureau of Labor Statistics (BLS).

FINDINGS

The number and rate of fatal injuries in construction versus non-construction was examined first (Chart 38a). In 2008, the construction industry accounted for 20.9% (n=975) of the 4,670 fatal injuries among private industry workers. This percentage slightly increased in 2023, up to 22.2% (n=1,075) of that year's 4,838 fatal injuries, even though only 7.4% of all employed persons 16 years and over worked in construction (BLS, 2024). Between 2008 and 2023, the rate of fatal injuries in construction declined 2.0% (9.8 to 9.6 per 100,000 FTEs), compared to an 8.6% decrease among all non-construction workers (3.5 to 3.2 per 100,000 FTEs).

Chart 38a. Number and rate* of fatal injuries, construction versus non-construction (2008-2023; private industry)

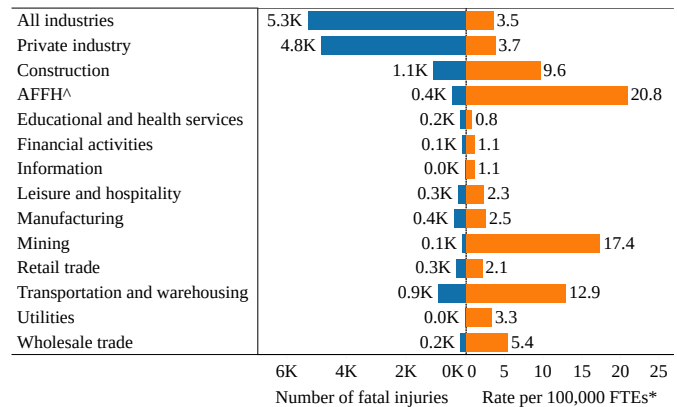


Source: U.S. Bureau of Labor Statistics, 2011-2023 Hours-based fatal injury rates by industry, occupation, and selected demographics.

*Rate calculated using total hours worked provided by BLS per 100,000 full-time equivalents. Due to rounded values being provided high-level estimates may not match BLS.

In 2023, construction had the highest number of fatal injuries (n=1.1K), followed by transportation and warehousing (0.9K; Chart 38b). Construction had the fourth-highest fatal injury rate with 9.6 per 100,000 FTEs, behind agriculture, forestry, fishing, and hunting (20.8 per 100,000 FTEs), mining (17.4 per 100,000 FTEs), and transportation and warehousing (12.9 per 100,000 FTEs).

Chart 38b. Number and rate* of fatal injuries, by industry (2023; private industry)

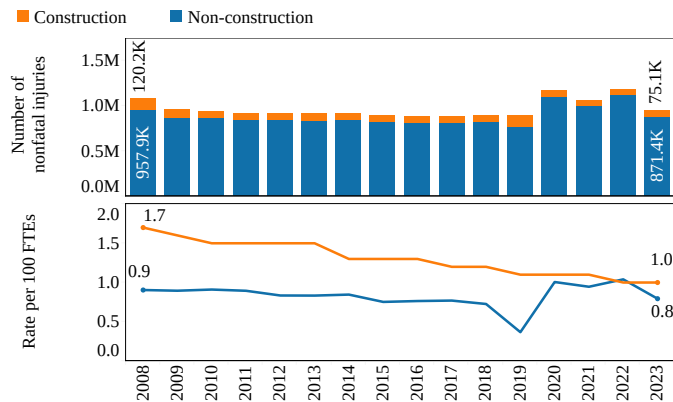


Source: U.S. Bureau of Labor Statistics, 2023 Hours-based fatal injury rates by industry, occupation, and selected demographics.

*Rate calculated using total hours worked provided by BLS per 100,000 full-time equivalents. Due to rounded values being provided high-level estimates may not match BLS.

Next, industry trends were examined for nonfatal injuries resulting in *days away from work* (DAFW; Chart 38c). In 2008, the construction industry accounted for 11.1% of reported injuries. This percentage decreased to 7.9% of reported injuries in 2023. Over that period, the rate of nonfatal injuries dropped 41.2% among construction workers (1.7 to 1.0 per 100 FTEs), compared to a 11.1% decline among all non-construction workers (0.9 to 0.8 per 100 FTEs).

Chart 38c. Number and rate* of nonfatal injuries, construction versus non-construction (2008-2023)

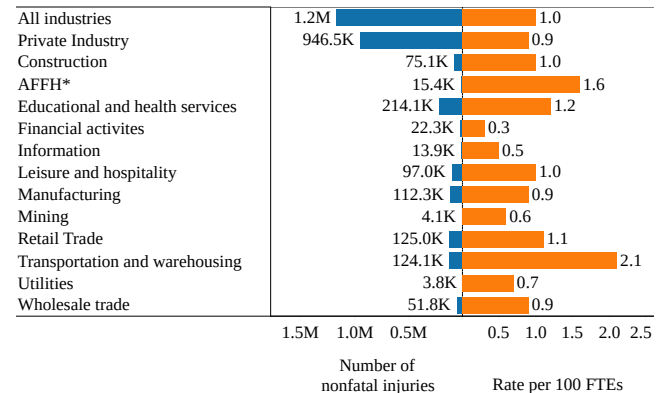


Source: U.S. Bureau of Labor Statistics. Table 1 Incidence Rates of nonfatal occupational injuries and illnesses by industry and case types and Table 2. Number of nonfatal occupational injuries and illnesses by industry and case types.

*Rate calculated using total hours worked provided by BLS per 100 full-time equivalents. Due to rounded values being provided high-level estimates may not match BLS.

By industry, construction had the sixth highest number of nonfatal injuries by all industries examined, with 75.1K nonfatal injuries in 2023 (Chart 38d). Construction had a slightly higher rate of these injuries than all private industry (1.0 versus 0.9 per 100 FTEs). The rate of nonfatal injuries was 1.0 per 100 FTEs in construction, which was tied as the fifth highest rate, along with Leisure and Hospitality.

Chart 38d. Number and rate of nonfatal injuries, by industry (2023)



Source: U.S. Bureau of Labor Statistics. Table 1 Incidence Rates of nonfatal occupational injuries and illnesses by industry and case types, 2023 and Table 2. Number of nonfatal occupational injuries and illnesses by industry and case types, 2023.

*Agriculture, forestry, fishing and hunting.

TAKEAWAYS

Construction continues to be one of the industries with the highest number and rate of both fatal and nonfatal injuries. From 2008 to 2023, there was a 2.0% decline in the rate of fatal work injuries in construction, while there was an 8.6% decrease among non-construction workers. Nonfatal injuries also decreased 41.2% in construction for the same compared to, 11.1% among non-construction workers. These statistics provide reminders of why it remains important to monitor injury trends by industry.

RELATED CPWR PRODUCTS

- Trueblood, A.B., Harris, W., Yohannes, T. [2024, July]. Fatal Injury Trends in the Construction Industry, 2011-2022. www.cpwr.com/wp-content/uploads/DataBulletin-July2024.pdf.
- CPWR—The Center for Construction Research. [n.d.]. Injury Data Dashboards. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/injuries-illnesses-health/.
 - o The Fatal and Nonfatal Injuries interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by year, demographic, subsector, and injury characteristic.

DEFINITIONS

- **Days away from work (DAFW)** – Nonfatal injury cases resulting in at least one day away from work beyond the day of injury or illness onset.
- **Full-time equivalent worker (FTEs)** – Determined by the hours worked per employee on a full-time basis, defined as working 2,000 hours (40 hours x 50 weeks) per year.

DATA SOURCES AND NOTES

U.S. Bureau of Labor Statistics (BLS). (2025). Hours-based fatal injury rates by industry, occupation, and selected demographics, 2011-2023. www.bls.gov/iif/additional-resources/cfoi-hours-based-rates.htm.

- Rate calculated using total hours worked provided by BLS per 100,000 full-time equivalents. Due to rounded values being provided high-level estimates do not match BLS.

U.S. Bureau of Labor Statistics (BLS). (2025). Table 1. Incidence rates of nonfatal occupational injuries and illnesses by industry and case types, 2023. www.bls.gov/web/osh/table-1-industry-rates-national.htm.

U.S. Bureau of Labor Statistics (BLS). (2025). Table 2. Number of nonfatal occupational injuries and illnesses by industry and case types, 2023.

www.bls.gov/iif/nonfatal-injuries-and-illnesses-tables/table-2-injury-and-illness-counts-by-industry-2023-national.htm.

- Nonfatal injuries are for private wage-and-salary workers.
- Rate calculated using total hours worked provided by BLS per 100 full-time equivalents. Due to rounded values being provided high-level estimates may not match BLS.

REFERENCES

U.S. Bureau of Labor Statistics (BLS). (n.d.). Number and rate of fatal work injuries, by private industry sector. www.bls.gov/charts/census-of-fatal-occupational-injuries/number-and-rate-of-fatal-work-injuries-by-industry.htm.

U.S. Bureau of Labor Statistics (BLS). (2024). Employed persons by detailed industry and age. www.bls.gov/cps/data/aa2023/cpsaat18b.htm.

Injuries in Construction by Major Subsector

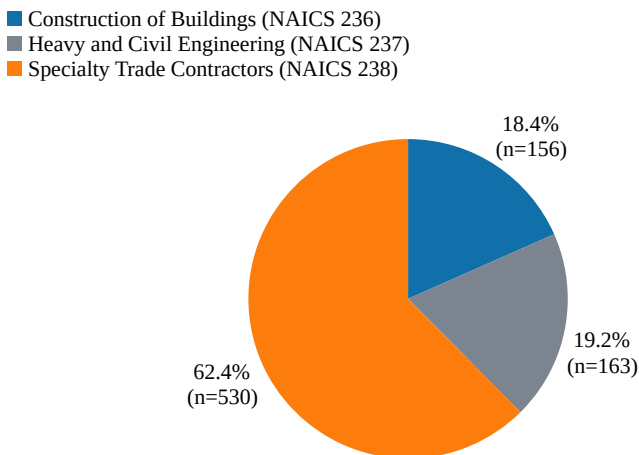
The construction workforce is rapidly changing, including employment in the industry rising 31.6% from 2011 to 2023 (CPWR, 2025). Each construction *major subsector* has grown from 2011 to 2023, with the largest increase being 48.3% among Construction of Buildings (NAICS 236; CPWR, 2025).

As the industry changes it is important to monitor injury trends, to help identify areas for targeted prevention efforts and subsectors at increased risk. This chapter examines fatal and nonfatal injury trends in construction by major subsector.

FINDINGS

In 2023, three out of five (62.4%) fatal injuries in construction with a reported major subsector occurred among workers at Specialty Trade Contractors (NAICS 238; Chart 39a). Workers in Construction of Buildings (NAICS 236; 18.4%) and Heavy and Civil Engineering (NAICS 237; 19.2%) each accounted for approximately 20% of fatal injuries. This aligns with construction employment, where Specialty Trade Contractors accounted for 63.8% of private wage-and-salary employment in 2023 (CPWR, 2025).

Chart 39a. Fatal injuries in construction, by major subsector* (2023)

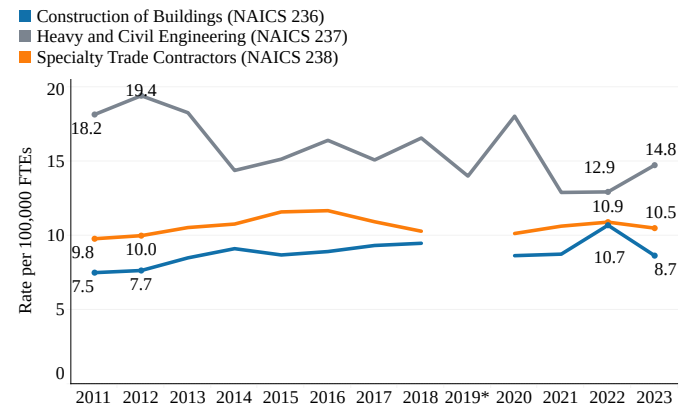


Source: U.S. Bureau of Labor Statistics, 2023 Census of Fatal Occupational Injuries.

*849 out of 1,099 injuries had reported major subsector.

The rate of fatal injuries in 2023 by major subsector was then examined. Heavy and Civil Engineering (NAICS 237) workers had the highest rate at 14.8 per 100,000 *full-time equivalents (FTEs)*, followed by 10.5 per 100,000 FTEs among workers at Specialty Trade Contractors (NAICS 238; Chart 39b). From 2011 to 2023, Construction of Buildings (NAICS 236) had the largest increase in rate: 16.0%, from 7.5 to 8.7 per 100,000 FTEs. During this period, fatalities among workers at Specialty Trade Contractors (NAICS 238) rose 7.1% (from 9.8 to 10.5 per 100,000 FTEs), whereas the rate at Heavy and Civil Engineering (NAICS 237) decreased 18.7%, from 18.2 to 14.8 per 100,000 FTEs. For all construction, the fatality rate decreased 5.2% from 2012 to 2023 (Dufoe et al., 2025).

Chart 39b. Rate of fatal injuries in construction, by major subsector (2011-2023)

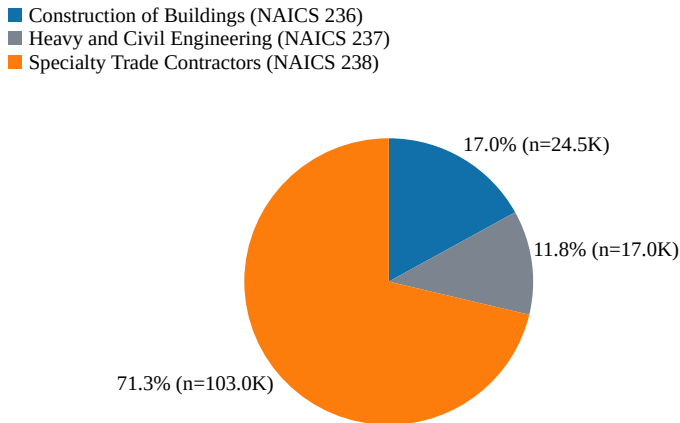


Source: U.S. Bureau of Labor Statistics, 2011-2023 Census of Fatal Occupational Injuries and 2011-2023 Quarterly Census of Employment and Wages.

*Data suppressed in 2019 due to new data disclosure policies.

Next, nonfatal injuries resulting in *days away from work (DAFW)* were examined by major subsector (Chart 39c). From 2021 to 2022, almost three out of four (71.3%) nonfatal injuries occurred among workers at Specialty Trade Contractors (NAICS 238). About one out of six (17.0%) occurred among workers in Construction of Buildings (NAICS 236) and 11.8% in Heavy and Civil Engineering (NAICS 237).

Chart 39c. Nonfatal injuries in construction, by major subsector* (2021-2022)

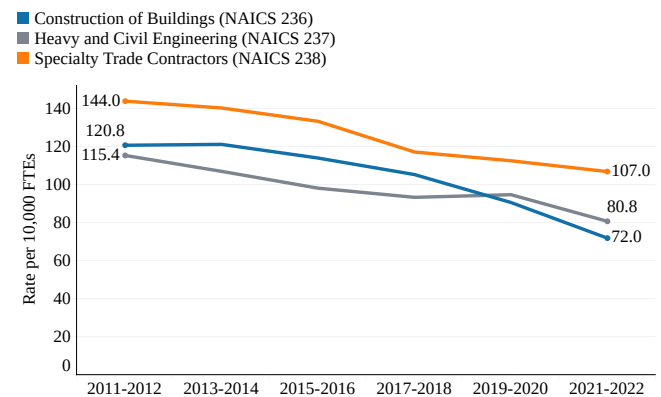


Source: U.S. Bureau of Labor Statistics, 2021-2022 Survey of Occupational Injuries and Illnesses.

*144,470 out of 144,480 injuries had reported major subsector.

The major subsector with the highest rate of nonfatal injuries from 2021 to 2022 was Specialty Trade Contractors (NAICS 238), at 107.0 per 10,000 FTEs. Next was Heavy and Civil Engineering (NAICS 237), at 80.8 per 10,000 FTEs, and then Construction of Buildings (NAICS 236), at 72.0 per 10,000 FTEs (Chart 39d). From 2011-2012 to 2021-2022, the rate of nonfatal injuries declined for workers at all major subsectors. Construction of Buildings (NAICS 236) fell 40.4% (120.8 to 72.0 per 10,000 FTEs) followed by a decline of 30.0% at Heavy and Civil Engineering (NAICS 237; 115.4 to 80.8 per 10,000 FTEs) and of 25.7% at Specialty Trade Contractors (NAICS 238; 144.0 to 107.0 per 10,000 FTEs).

Chart 39d. Rate of nonfatal injuries in construction, by major subsector (2011-2022)



Source: U.S. Bureau of Labor Statistics, 2011-2022 Survey of Occupational Injuries and Illnesses and 2011-2022 Quarterly Census of Employment and Wages.

TAKEAWAYS

Specialty Trade Contractors (NAICS 238), the subsector that employs the largest percentage of workers, also accounted for a majority of fatal and nonfatal injuries (CPWR, 2025). While nonfatal injury rates declined, the rates for fatal injuries increased for Construction of Buildings (NAICS 236) firms and Specialty Trade Contractors (NAICS 238), supporting the continuing need to monitor injury trends by major subsector.

RELATED CPWR PRODUCTS

- CPWR–The Center for Construction Research. [n.d.]. Injury Data Dashboards. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/injuries-illnesses-health/.
- Trueblood, A.B., Harris, W., Yohannes, T. [2024, July]. Fatal Injury Trends in the Construction Industry, 2011-2022. www.cpwr.com/wp-content/uploads/DataBulletin-July2024.pdf.

DEFINITIONS

- **Days away from work (DAFW)** – *Nonfatal injury cases resulting in at least one day away from work beyond the day of injury or illness onset.*
- **Full-time equivalent worker (FTEs)** – *Determined by the hours worked per employee on a full-time basis, defined as working 2,000 hours (40 hours x 50 weeks) per year.*
- **Major subsector** – *3-digit NAICS codes within construction. See Chapter 1 "Pulling and Classifying Data" for details.*

DATA SOURCES AND NOTES

U.S. Bureau of Labor Statistics (BLS). (2025). 2011-2023 Census of Fatal Occupational Injuries. www.bls.gov/iif/home.htm.

- All charts show injuries among private industry wage-and-salary workers based on data availability and to match employment estimates.

U.S. Bureau of Labor Statistics (BLS). (2025). 2011-2023 Quarterly Census of Employment and Wages. www.bls.gov/cew/.

U.S. Bureau of Labor Statistics (BLS). (2025). 2021-2022 Survey of Occupational Injuries and Illnesses. www.bls.gov/iif/home.htm.

- All charts show injuries among private industry wage-and-salary workers based on data availability and to match employment estimates.
- Two-year estimates are used throughout due to SOII moving to biennial estimates for the latest reporting period.

REFERENCES

CPWR–The Center for Construction Research. (2025). Employment Trends. [dashboard]. www.cpwrt.com/research/data-center/the-construction-chart-book/interactive-7th/employment-income/employment-trends/.

Dufoe, D., Trueblood, A., Brooks, R.D., Harris, W. (2025, April). Construction Worker Injuries, Overdoses, and Suicides. www.cpwrt.com/wp-content/uploads/DataBulletin-April2025.pdf.

Fatal and Nonfatal Injuries by Demographics and Characteristics

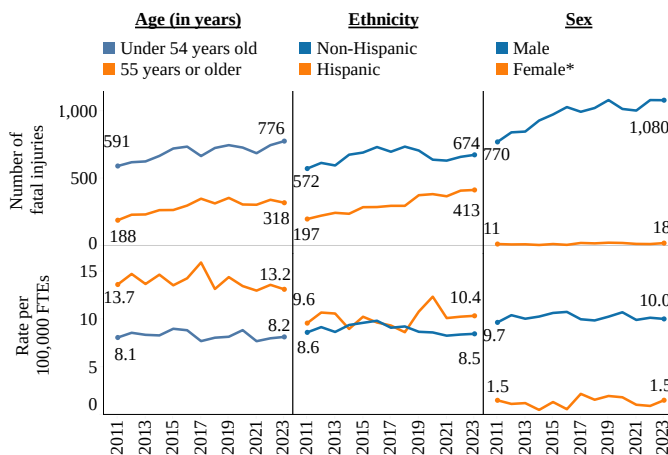
With construction's exceptionally high number and rate of injuries, understanding which workers are at increased risk can guide prevention and intervention efforts. Areas of emphasis may also need to shift quickly, as the industry is rapidly changing (see Chapter 10: Employment Trends). The need for these safety efforts has continued to grow: from 2011 to 2021, construction employment increased twice as fast as that in all industries (Harris et al., 2022).

This chapter compares fatal and nonfatal injuries by demographics and characteristics as reported in the Census of Fatal Occupational Injuries (CFOI) and Survey of Occupational Injuries and Illnesses (SOII) published by the U.S. Bureau of Labor Statistics (BLS). The latest data is presented for each data source with CFOI going to 2023 and SOII going to 2021-2022.

FINDINGS

Demographics of fatal injuries were examined first. In 2023, the highest number of injuries were among males (n=1,080; 10.0 per 100,000 *full time equivalents* (FTEs)), while the highest rate was among workers 55 years or older (n=318; 13.2 per 100,000 FTEs; Chart 40a). By age, from 2011 to 2023 the number of injuries grew 69.1% (188 to 318) among workers 55 years or older, while the rate decreased 3.6% (13.7 to 13.2 per 100,000 FTEs). During this period, the number of fatal injuries increased 109.6% (197 to 413) and the rate rose 8.3% (9.6 to 10.4 per 100,000 FTEs). Fatal injuries among males grew 40.3% (770 to 1,080), while the rate increased 3.1% (9.7 to 10.0 per 100,000 FTEs).

Chart 40a. Number and rate of fatal injuries, by demographics (2011-2023)

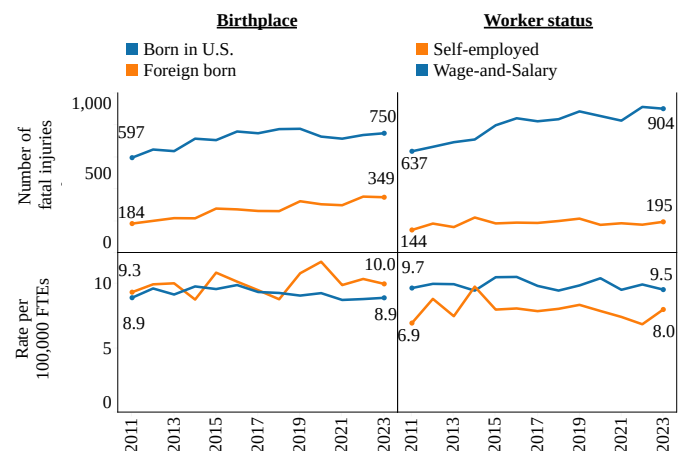


Source: U.S. Bureau of Labor Statistics, 2011-2023 Census of Fatal Occupational Injuries and IPUMS, 2011-2023 Current Population Survey.

*Low frequency <30. Interpret with caution.

Characteristics of those who were fatally injured at work were then analyzed (Chart 40b). The number of fatal injuries among those born in the U.S. rose 25.6% (597 to 750) and the rate stayed constant at 8.9 per 100,000 FTEs. In comparison, among foreign-born workers the number of fatal injuries more than doubled (184 to 389, +111.4%) and the rate increased 7.5% (9.3 to 10.0 per 100,000 FTEs). The number of injuries among wage-and-salary workers rose 41.9% (637 to 904), while the rate fell 2.1% (9.7 to 9.5 per 100,000 FTEs). Among self-employed workers, the number of injuries increased (144 to 195, +35.4%), as did the rate (6.9 to 8.0 per 100,000 FTEs, +15.9%).

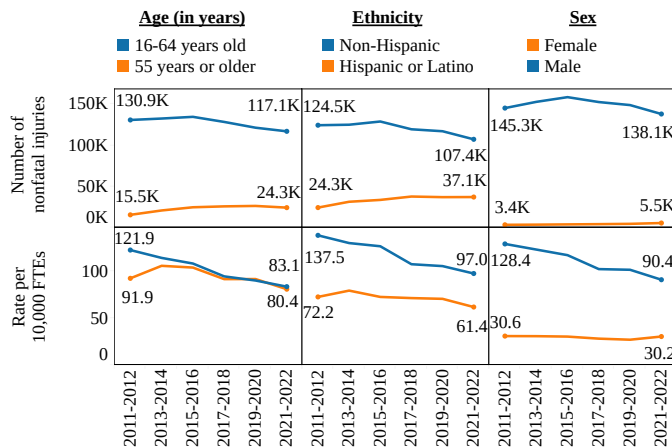
Chart 40b. Number and rate of fatal injuries, by characteristics (2011-2023)



Source: U.S. Bureau of Labor Statistics, 2011-2023 Census of Fatal Occupational Injuries and IPUMS, 2011-2023 Current Population Survey.

Next, nonfatal injuries resulting in *days away from work (DAFW)* were examined by demographics (Chart 40c). In 2023, the largest number of nonfatal injuries among the demographics examined were for males (n=138.1 thousand (K); 90.4 per 10,000 FTEs), while the rate was highest among non-Hispanic workers (107.4K; 87.0 per 10,000 FTEs). From 2011 to 2023, the number of nonfatal injuries increased 56.8% (15.5K to 24.3K) among workers 55 years or older, while the rate for these workers fell 12.5% (91.9 to 80.4 per 10,000 FTEs). The number of nonfatal injuries among Hispanic workers rose 52.7% (24.3K to 37.1K), while their rate fell 15.0% (72.2 to 61.4 per 10,000 FTEs). The number of nonfatal injuries increased 61.8% (3.4K to 5.5K) among male construction workers, while their rate decreased 1.3% (30.6 to 30.2 per 10,000 FTEs).

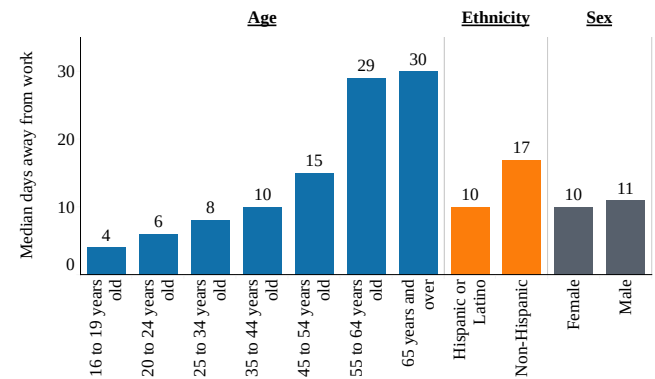
Chart 40c. Number and rate of nonfatal injuries, by demographics (2011-2022)



Source: U.S. Bureau of Labor Statistics, 2011-2022 Survey of Occupational Injuries and Illnesses and IPUMS, 2011-2022 Current Population Survey.

Nonfatal injuries in construction resulted in a median of 11 days away from work during 2021-2022 (BLS, n.d.), with that figure varying by demographic (Chart 40d). By age, workers 65 years or older had the longest median days (30 days) away from work due to nonfatal injuries from 2021-2022. Non-Hispanic workers had a median of 17 days away from work per injury, compared to 10 days for Hispanic workers. Males and females had a similar median days away from work (10 and 11, respectively).

Chart 40d. Median days away from work resulting from nonfatal injuries, by demographics (2021-2022)



Source: U.S. Bureau of Labor Statistics, 2011-2022 Survey of Occupational Injuries and Illnesses.

TAKEAWAYS

Overall, males had the highest number of fatal injuries in 2023 (n=1,080) and the highest number of nonfatal injuries from 2021-2022 (n=138.1K). Workers 55 years or older had the highest fatality rate (13.2 per 100,000 FTEs) and non-Hispanic workers had the highest nonfatal injury rate (87.0 per 10,000 FTEs).

Fatal and nonfatal injuries had differing trends for the various factors examined in this chapter, which show targeted injury prevention efforts should differ based on the demographic or worker group being addressed. In addition, the findings highlight the need to monitor these trends, as well as to examine various metrics of injuries, such as examining rates that account for the overall workforce and days away from work which show severity of nonfatal injuries resulting in DAFW.

RELATED CPWR PRODUCTS

- CPWR–The Center for Construction Research and Training. [n.d.]. Employment Trends Data. [dashboard]. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/employment-income/.
- CPWR–The Center for Construction Research. [n.d.]. Injury Data Dashboards. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/injuries-illnesses-health/.
- Trueblood, A.B., Harris, W., Yohannes, T. [2024, July]. Fatal Injury Trends in the Construction Industry, 2011-2022. www.cpwr.com/wp-content/uploads/DataBulletin-July2024.pdf.

DEFINITIONS

- **Days away from work (DAFW)** – *Nonfatal injury cases resulting in at least one day away from work beyond the day of injury or illness onset.*
- **Full-time equivalent (FTEs)** – *Determined by the hours worked per employee on a full-time basis, defined as working 2,000 hours (40 hours x 50 weeks) per year.*

DATA SOURCES AND NOTES

Sarah Flood, Miriam King, Renae Rodgers, Steven Ruggles, J. Robert Warren, and Michael Westberry. Integrated Public Use Microdata Series, 2011-2023 Current Population Survey: Version 9.0 [dataset]. Minneapolis, MN: IPUMS, 2025. doi.org/10.18128/D030.V9.0.

U.S. Bureau of Labor Statistics (BLS). (2025). 2011-2023 Census of Fatal Occupational Injuries (CFOI). www.bls.gov/iif/.

U.S. Bureau of Labor Statistics (BLS). (2025). 2021-2022 Survey of Occupational Injuries and Illnesses. www.bls.gov/iif/.

- SOII data shows injuries among private wage-and-salary workers.
- Two-year estimates are used throughout due to SOII moving to biennial estimates for the latest reporting period.

REFERENCES

Harris, W., Brown, S., & Trueblood, A. (2022). Employment Trends and Projections in Construction. www.cpwr.com/wp-content/uploads/DataBulletin-March2022.pdf.

U.S. Bureau of Labor Statistics (BLS). (n.d.). Biennial Nonfatal Case and Demographic numbers and rates: selected characteristics database. www.bls.gov/iif/data.htm.

Focus Four Injuries

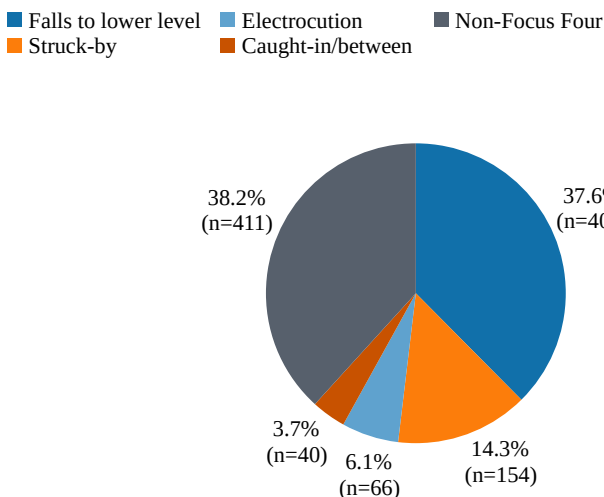
In October 1994 OSHA developed an inspection standard that prioritized the four leading causes of on-the-job deaths. Now known as the *Focus Four*, they totaled 90% of construction fatalities at that time: falls from elevations (33%), struck by (22%), caught in/between (18%), and electrical shock (17%; OSHA 1994). In 2023, these hazards accounted for 61.8% of fatalities (Chart 41a below).

Due to their continued impact on the industry, the Focus Four deserve additional examination to monitor construction safety trends. This chapter examines these types of injuries, including breaking them down by contributing *event/exposure* (i.e., cause of death) and by year. Data come from the U.S. Bureau of Labor Statistics' Census of Fatal Occupational Injuries (BLS CFOI), which recently underwent changes in the coding system used for classifying fatalities. As a result, compatibility with prior years of data is limited, and estimates for 2023 are available for only private construction employment.

FINDINGS

Among deaths in private construction in 2023, Focus Four injuries accounted for over three in five fatalities (61.8%; Chart 41a). *Falls to lower level* alone accounted for more than one in three injuries (37.6%) and 60.8% (n=404) of Focus Four fatal injuries that year. *Struck-by* injuries were the second most common, accounting for 14.3% of injuries (n=154) followed by *electrocutions* (6.1%; n=66) and *caught-in/between* (3.7%; n=40). Falls to a lower level have historically been a leading cause of death in construction and continue to be so in recent years (CPWR, 2013, 2018).

Chart 41a. Focus four injuries, by type (2023)

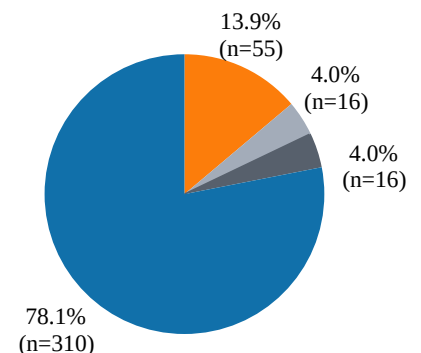


Source: U.S. Bureau of Labor Statistics, 2023 Census of Fatal Occupational Injuries.

Of falls to a lower level in 2023, more than three-quarters (78.1%; n=310) were categorized as other fall to lower level (including through openings or off ladders/objects that do not result from/in exposure or contact; Chart 41b). Falls from collapsing structure or equipment were the second most common category (13.9%; n=55) followed by falls resulting in (4.0%; n=16) and from (4.0%; n=16) exposure to electricity or contact with objects.

Chart 41b. Falls to lower level, by event/exposure (2023)*

- Fall to lower level from collapsing structure or equipment
- Fall to lower level resulting from exposure or contact
- Fall to lower level resulting in exposure or contact
- Other fall to lower level

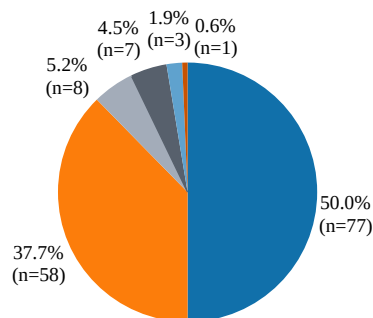


Source: U.S. Bureau of Labor Statistics, 2023 Census of Fatal Occupational Injuries.
*Total may not match total falls to a lower level as breakdowns are for cases with a reported 3-digit event/exposure.

Among struck-by injuries, half (50.0%; n=77) were due to being struck by a propelled, falling, or suspended object (Chart 41c). The second leading cause were pedestrian incidents involving motorized land vehicles (37.7%; n=58). The remainder of struck-by injuries (n=19) were split between contact with equipment and machinery or being struck by rolling, sliding, or shifting objects.

Chart 41c. Fatal struck-by injuries, by event/exposure (2023)

- Struck by propelled, falling, or suspending object
- Pedestrian incidents involving motorized land vehicles
- Struck by running powered equipment — during maintenance, cleaning, testing
- Struck by rolling powered vehicle or machinery
- Struck by running powered equipment — irregular movement, kick back
- Struck by rolling, sliding, or shifting objects — non-running

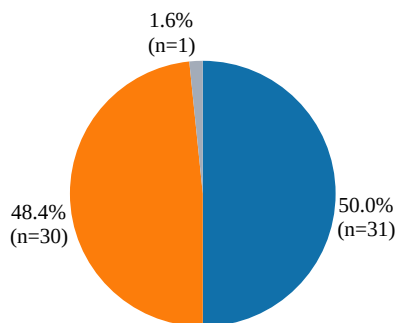


Source: U.S. Bureau of Labor Statistics, 2023 Census of Fatal Occupational Injuries.

In 2023, electrocutions were split nearly evenly between *direct* (50.0%; n=31) and *indirect* (48.4%; n=30) exposure (Chart 41d). There was one observed death due to electric arc during that year.

Chart 41d. Fatal electrocutions, by event/exposure (2023)*

- Direct exposure to electricity
- Indirect exposure to electricity
- Exposure to electric arc



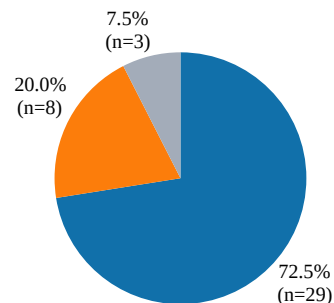
Source: U.S. Bureau of Labor Statistics, 2023 Census of Fatal Occupational Injuries.

*Total may not match total electrocutions as breakdowns are for cases with a reported 3-digit event/exposure.

When examining caught-in/between injuries by event/exposure, a majority (72.5%; n=29) were due to collapse, engulfment (Chart 41e). Being compressed between running equipment and other objects (20.0%; n=8) was the second most common event/exposure, followed by being caught or wedged between non-running objects (7.5%; n=3).

Chart 41e. Fatal caught-in/between injuries, by event/exposure (2023)

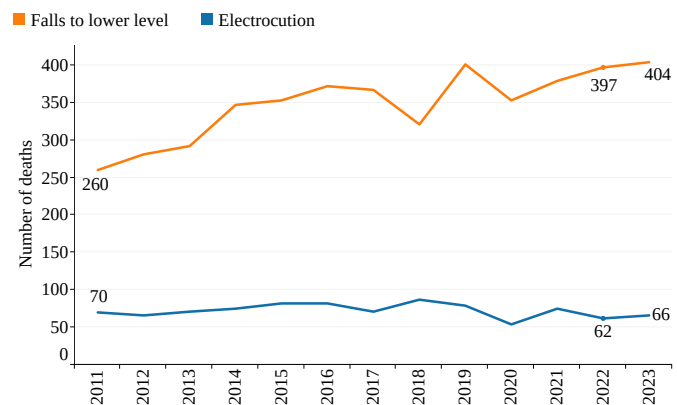
- Collapse, engulfment
- Compressed between running equipment and other object(s)
- Caught or wedged between objects — non-running



Source: U.S. Bureau of Labor Statistics, 2023 Census of Fatal Occupational Injuries.

In 2023, BLS changed from Occupational Injuries and Illness Classification System (OIICS) 2.0 to 3.0, which impacts definitions used. Comparisons tracking Focus Four injuries pre- and post-2023 in construction should be made with caution. Falls to lower level and electrocutions were more easily examined due to comparable definitions over time, while major changes limited the ability to look at struck-by and caught-in/between injuries (Chart 41f). From 2011 to 2023, fatal falls to lower level increased 55.4% (260 to 404) while steadily rising throughout the period. Conversely, electrocutions decreased 5.7% (70 to 66) from 2011 to over these years remaining relatively steady over these years.

Chart 41f. Fatal falls and electrocutions*, by year (2011-2023)



Source: U.S. Bureau of Labor Statistics, 2011-2023 Census of Fatal Occupational Injuries.

*Due to differences between OIICS 2.0 and OIICS 3.0 codes beginning in 2023, struck-by and caught-in/between deaths are excluded and comparisons between pre- and post-2023 data should be made with caution.

TAKEAWAYS

Three decades after the creation of OSHA's focused inspection initiative to address the Focus Four in construction, these injuries continue to represent a majority of construction deaths in the U.S. However, their proportion has declined from approximately 90% in 1994 to 62% in 2023 indicating that gains have been made over this three-decade period. Future work examining the Focus Four may necessitate looking at injuries to see if different injury categories have risen more prominently than the current Focus Four.

RELATED CPWR PRODUCTS

- CPWR—The Center for Construction Research and Training. [2025]. Electrical Injuries in Construction. [dashboard]. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/injuries-illnesses-health/.
- CPWR—The Center for Construction Research and Training. [2025]. Falls, Slips, and Trips in Construction. [dashboard]. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/injuries-illnesses-health/.
- CPWR—The Center for Construction Research and Training. [2025]. Focus Four Injuries. [dashboard]. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/injuries-illnesses-health/.
 - This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by focus four injury.
- CPWR—The Center for Construction Research and Training. [2025]. Transportation Injuries. [dashboard]. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/injuries-illnesses-health/.

DEFINITIONS

- **Event/exposure** – The manner in which the injury or illness was produced or inflicted, such as a fall, heat-related illness, etc. Based on the OIICS 3.0 Manual for 2023 and OIICS 2.0 Manual for 2011-2022, see www.bls.gov/iif/definitions/occupational-injuries-and-illnesses-classification-manual.htm.
- **Focus Four** – The top four injury groups which cause a majority of fatal injuries in construction.
 - **Caught-in/between**
 - **2023:** Includes OIICS 3.0 codes 63 (Collapse, engulfment), 653 (Caught, entangled in running powered equipment – normal operation), 654 (Compressed between running equipment and other object(s)), 662 (Entangled in non-running object), 664 (caught or wedged between objects – non-running).
 - **Electrocution**
 - **Direct exposure (OIICS 511)** – Contact made by directly touching the power source, such as a live wire
 - **Indirect exposure (OIICS 512)** – Contact made by a conductive material touches an electricity source, such as a crane hitting a power line.
 - **2011-2022:** Includes OIICS 2.0 code 51 (Exposure to electricity).
 - **2023:** Includes OIICS 3.0 codes 510 (Exposure to electricity – unspecified), 511 (Direct exposure to electricity), 512 (Indirect exposure to electricity), and 513 (Exposure to electric arc).
 - Due to changes from OIICS 2.0 to 3.0 regarding falls preceding electric exposure, slight differences in the coding consistency of electric injuries 2023 and onward are expected.
 - **Falls to lower level**
 - **2011-2022:** Includes OIICS 2.0 code 43 (Falls to lower level)
 - **2023:** Includes OIICS 3.0 codes 410 (Fall to lower level – unspecified), 411 (Fall to lower level from collapsing structure or equipment), 412 (Fall to lower level resulting from exposure or contact), 413 (Fall to lower level resulting in exposure or contact), 414 (Other fall to lower level), and 419 (Fall to lower level – caught self or curtailed).
 - **Struck-by**
 - **2023:** Includes OIICS 3.0 codes 25 (Pedestrian incidents involving motorized land vehicles), 64 (Struck by propelled, falling, or suspending object), 650 (Struck by running powered equipment – unspecified), 651 (Struck by running

powered equipment – irregular movement, kick back), 652 (Struck by running powered equipment – during maintenance, cleaning, testing), 655 (Struck by rolling powered vehicle or machinery), 659 (Struck by running powered equipment – n.e.c.), 660 (Contact with non-running objects or equipment – unspecified), and 663 (Struck by rolling, sliding, or shifting objects – non-running).

DATA SOURCES AND NOTES

U.S. Bureau of Labor Statistics (BLS). (2025). 2011-2023 Census of Fatal Occupational Injuries. www.bls.gov/iif/.

- Due to changes in OIICS 3.0, pre-2023 estimates are not comparable to post-2023 estimates of Focus Four injuries.

REFERENCES

CPWR–The Center for Construction Research and Training. (2013). Construction Chart Book 5th Edition. www.cpwr.com/wp-content/uploads/5th-Edition-Chart-Book-Final.pdf.

CPWR–The Center for Construction Research and Training. (2018). Construction Chart Book 6th Edition. www.cpwr.com/wp-content/uploads/The_6th_Edition_Construction_eChart.

Occupational Safety and Health Administration (OSHA). (1994). Guidance to Compliance Officers for Focused Inspections in the Construction Industry. www.osha.gov/laws-regs/standardinterpretations/1994-08-22-0.

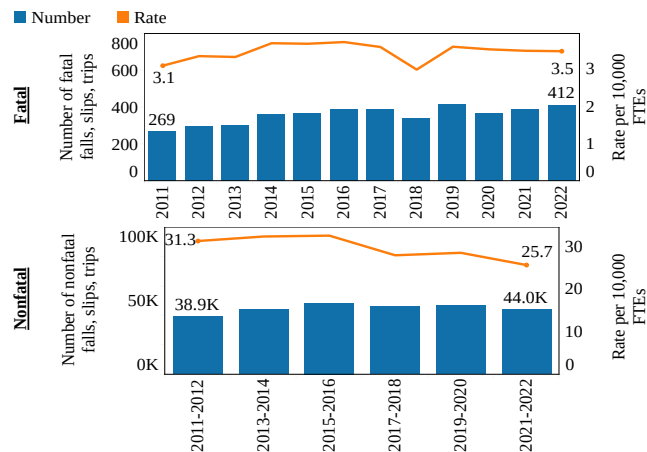
Falls, Slips, and Trips

Construction workers continue to be overrepresented in on-the-job *falls, slips, and trips* injuries in the U.S. (Harris et al., 2024). As shown below, falls to a lower level make up the overwhelming percentage of this category and have been a leading cause of injury since the *Focus Four* were defined in 1994 by OSHA (OSHA, 1994). A majority of fatal and nonfatal falls result from falls to a lower level among construction workers (Harris et al., 2024). This chapter examines falls, slips, and trips using U.S. Bureau of Labor Statistics (BLS) Census of Fatal Occupational Injuries (CFOI) and Survey of Occupational Injuries and Illnesses (SOII) data.

FINDINGS

From 2011 to 2022, there was a 53.2% increase in fatal falls, slips, and trips among construction workers (269 to 412) while the rate increased 12.9% (3.1 to 3.5 per 100,000 *full-time equivalents (FTEs)*; Chart 42a). In comparison, the number of nonfatal falls, slips, and trips resulting in *days away from work (DAFW)* increased 13.1% from 2011-2012 to 2021-2022 (38.9 thousand (K) to 44.0K) and the rate decreased 17.9% (31.3 to 25.7 per 10,000 FTEs).

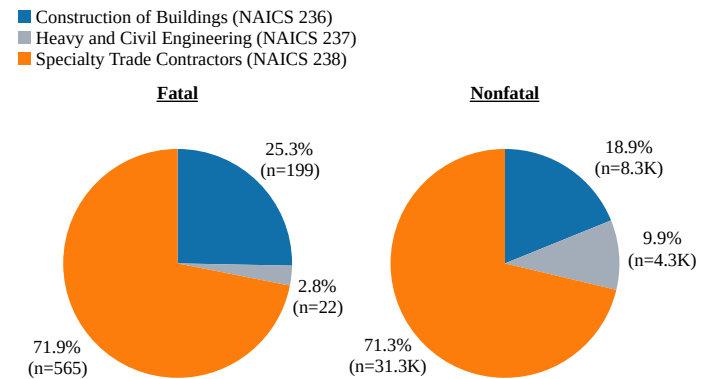
Chart 42a. Number and rate of falls, slips, trips, by injury type (2011-2022)



Source: U.S. Bureau of Labor Statistics, 2011-2022 Census of Fatal Occupational Injuries, 2021-2022 Survey of Occupational Injuries and Illnesses., and IPUMS, 2011-2022 Current Population Survey.

Next, falls, slips, and trips were examined by *major subsector* (Chart 42b). A majority of both fatal (71.9%) and nonfatal (71.3%) falls, slips, and trips occurred among Specialty Trade Contractors (NAICS 238) from 2021 to 2022. Construction of Buildings (NAICS 236) accounted for 25.3% of fatal falls, slips, and trips, but only one out of five (18.9%) nonfatal falls, slips and trips.

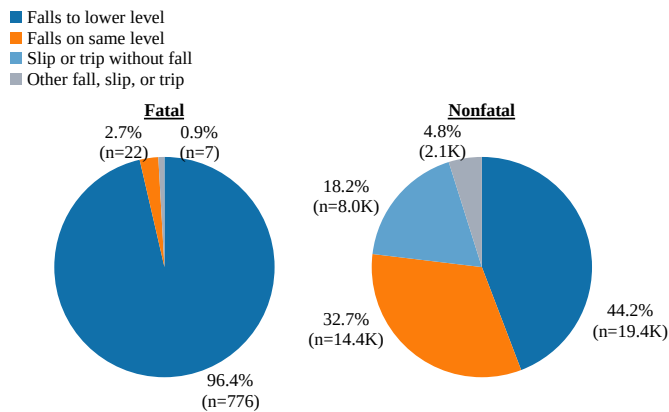
Chart 42b. Falls, slips, and trips, by injury type and major subsector (2021-2022)



Source: U.S. Bureau of Labor Statistics, 2021-2022 Census of Fatal Occupational Injuries and 2021-2022 Survey of Occupational Injuries and Illnesses.

Event/exposures (e.g., manner in which the injury was caused) of falls, slips and trips were then analyzed (Chart 42c). *Falls to a lower level* comprised an overwhelming majority of fatal (96.4%) injuries, as well as the largest share (44.2%) of nonfatal injuries. Almost a third (32.7%) of nonfatal falls, slips, and trips resulted from *falls on same level* but only 2.7% of fatal falls, slips, and trips did. Almost 1 in 5 (18.2%) of nonfatal falls, slips, and trips resulted from slips or trips without a fall.

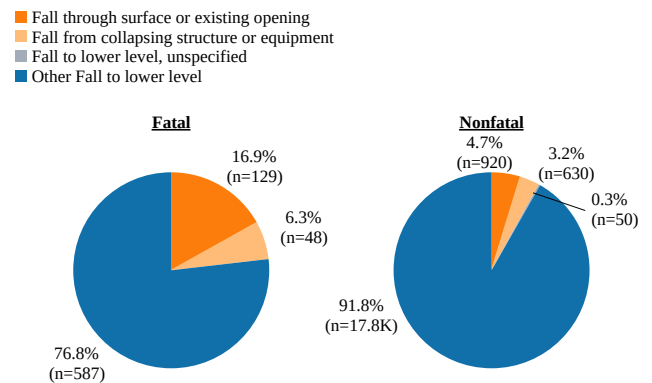
Chart 42c. Falls, slips, and trips, by injury type and detailed event/exposure (2021-2022)



Source: U.S. Bureau of Labor Statistics, 2021-2022 Census of Fatal Occupational Injuries and 2021-2022 Survey of Occupational Injuries and Illnesses.

Due to the high number of falls to a lower level, their event/exposures were also examined (Chart 42d). A majority of fatal (76.8%) and nonfatal (91.8%) falls were categorized as *other falls to a lower level*. Overall, 1 in 6 (16.9%) of fatal falls to a lower level resulted from falls through surface or existing openings, and 6.3% occurred from falls from a collapsing structure or equipment. In comparison, 4.7% of nonfatal falls, slips, and trips resulted from falls through surface or existing opening, while 3.2% were from falls from collapsing structure or equipment.

Chart 42d. Falls to lower level, by detailed event/exposure (2021-2022)



Source: U.S. Bureau of Labor Statistics, 2021-2022 Census of Fatal Occupational Injuries and 2021-2022 Survey of Occupational Injuries and Illnesses.

TAKEAWAYS

Both the number and rate of fatal falls, slips, and trips rose from 2011 to 2021, while the rate of nonfatal falls, slips, and trips decreased. This reduction should be further explored and monitored to determine what factors contributed to these incidents, which can help guide future prevention efforts. Falls to a lower level accounted for a majority of falls, slips, and trips. These findings highlight the need for further research to understand falls, slips, and trips to guide prevention efforts to address related hazards on job sites.

RELATED CPWR PRODUCTS

- CPWR—The Center for Construction Research and Training. [n.d.]. Falls, Slips, and Trips. [dashboard]. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/injuries-illnesses-health/.
 - This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by year and injury type.
- CPWR—The Center for Construction Research and Training. [n.d.]. Focus Four Injuries. [dashboard]. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/injuries-illnesses-health/.
- CPWR—The Center for Construction Research. [n.d.]. Stop Construction Falls. stopconstructionfalls.com.

DEFINITIONS

- **Days away from work (DAFW)** – Nonfatal injury cases resulting in at least one day away from work beyond the day of injury or illness onset.
- **Event/Exposure** – The way the injury or illness was produced or inflicted, such as a fall, heat-related illness, etc. For example, a worker using a hand-held electric auger that struck a powerline would have a reported event or exposure of “Exposure to electricity,” with their reported primary source being “Tools, instruments, and equipment: Handtools-powered.” Full definitions for categories can be found in the *Occupational Injury and Illness Classification Manual* (BLS, N.D.).
- **Falls, slips, and trips** – Includes falls on the same level, falls and jumps to lower levels, falls, and jumps that were curtailed by a personal arrest device, and slips and trips without a fall (OIICS code 4).
 - **Falls to a lower level** – Includes falls where the injury was produced by impact of the person and another surface of lower elevation (OIICS code 43).
 - **Other falls to a lower level** – Includes Falls to a lower level, unspecified (OIICS 430) and Other fall to lower level (OIICS 433).
 - **Falls on same level** – Includes falls where the injury was produced by the impact of the person and another surface without elevation (OIICS code 42).
- **Focus Four** – The top four injury groups which cause a majority of fatal injuries in construction.
- **Full-time equivalent (FTEs)** – Determined by the hours worked per employee on a full-time basis, defined as working 2,000 hours (40 hours x 50 weeks) per year.
- **Major subsector** – 3-digit NAICS codes within construction. See Chapter 1 “Pulling and Classifying Data” for details.

DATA SOURCES AND NOTES

Sarah Flood, Miriam King, Renae Rodgers, Steven Ruggles, J. Robert Warren, and Michael Westberry. Integrated Public Use Microdata Series, 2011-2023 Current Population Survey: Version 9.0 [dataset]. Minneapolis, MN: IPUMS, 2025. doi.org/10.18128/D030.V9.0.

U.S. Bureau of Labor Statistics (BLS). (2025). 2011-2022 Census of Fatal Occupational Injuries. www.bls.gov/iif/.

U.S. Bureau of Labor Statistics (BLS). (2025). 2011-2022 Survey of Occupational Injuries and Illnesses. www.bls.gov/iif/.

- SOII data shows injuries among private wage-and-salary workers.
- Two-year estimates are used throughout due to SOII moving to biennial estimates for the latest reporting period.

REFERENCES

Harris, W., Brooks, R.D., Trueblood, A.B., Yohannes, T., Bunting, J. (2024). Fatal and Nonfatal Falls in the U.S. Construction Industry, 2011-2022. www.cpwr.com/wp-content/uploads/DataBulletin-March2024.pdf.

Occupational Safety and Health Administration (OSHA). (1994). Guidance to Compliance Officers for Focused Inspections in the Construction Industry. www.osha.gov/laws-regs/standardinterpretations/1994-08-22-0.

U.S. Bureau of Labor Statistics (BLS). (n.d.). Occupational Injury and Illness Classification (OIICS) Manual. www.bls.gov/iif/definitions/occupational-injuries-and-illnesses-classification-manual.htm.

Electrical Injuries in Construction

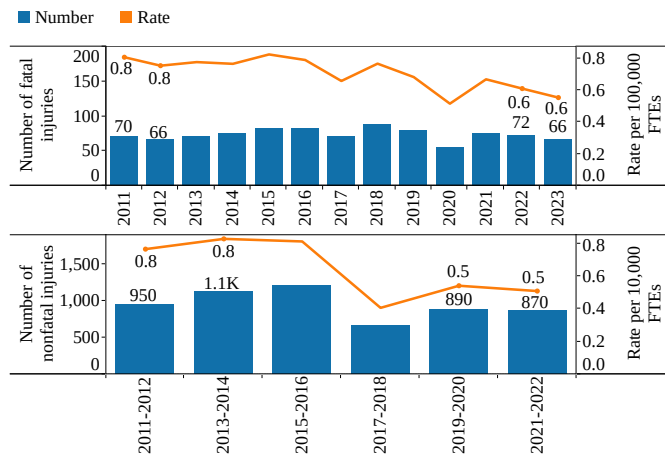
Construction has a disproportionately high number of fatal and nonfatal *electrical injuries*. For example, although the industry employs only 7.2% of all private wage-and-salary workers, it accounts for 45% of fatal *electrocutions* (Harris et al., 2023; BLS 2024).

Electrical injuries can range in *nature*, from *electrical burns* to electrocutions and electric shocks. Among electrical workers, common sources of injuries include direct or indirect exposure to electrical equipment and wiring (Earnest et al., 2019; Janicak, 2008). An example of *direct exposure* is touching a live wire, while operating a crane that touches a power line is an example of *indirect exposure*. This chapter examines recent electrical injury trends using U.S. Bureau of Labor Statistics (BLS) Census of Fatal Occupational Injuries (CFOI) and Survey of Occupational Injuries and Illnesses (SOII).

FINDINGS

There were 950 fatal electrical injuries among all construction workers from 2011 to 2023 (Chart 43a). During this period, the number of fatal electrical injuries decreased 5.7% (70 to 66), while the rate decreased 25.0% (0.8 to 0.6 per 100,000 full time equivalents (FTEs)). From 2011 to 2022, there were 5,720 nonfatal electrical injuries among private wage-and-salary workers in construction. During this period, the number of nonfatal injuries fell 8.4% (950 to 870), while the rate decreased 37.5% (0.8 to 0.5 per 10,000 FTEs).

Chart 43a. Number and rate of fatal and nonfatal* electrical injuries (2011-2023^)



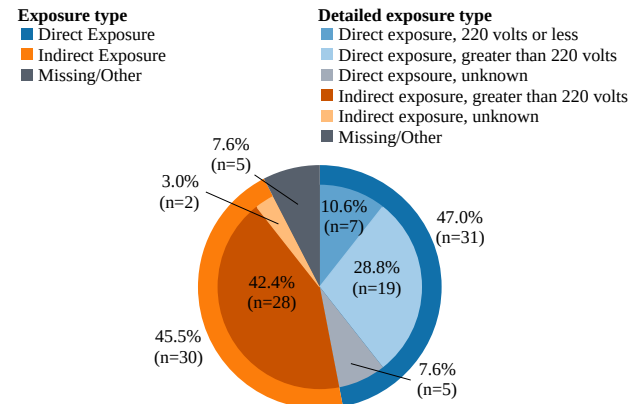
Source: U.S. Bureau of Labor Statistics, 2011-2023 Census of Fatal Occupational Injuries, 2011-2022 Survey of Occupational Injuries and Illnesses, and IPUMS, 2011-2023 Current Population Survey.

*Only private wage-and-salary workers included for nonfatal injuries.

^CFOI goes through 2023, while SOII goes through 2022. SOII presented using two-year estimates to match 2021-2022 data changes.

Exposure types for fatal electrical injuries among construction workers in the private industry were then examined. In 2023, 47.0% (n=31) of these injuries with a reported detailed event/exposure resulted from direct exposure to electricity, and 71.2% (n=47) of them involved *exposure greater than 220 volts* (Chart 43b). Indirect exposure to electricity greater than 220 volts comprised 42.4% (n=28) of fatal electrical injuries in the industry in 2023.

Chart 43b. Fatal electrical injuries, by event type^ (private industry; 2023)

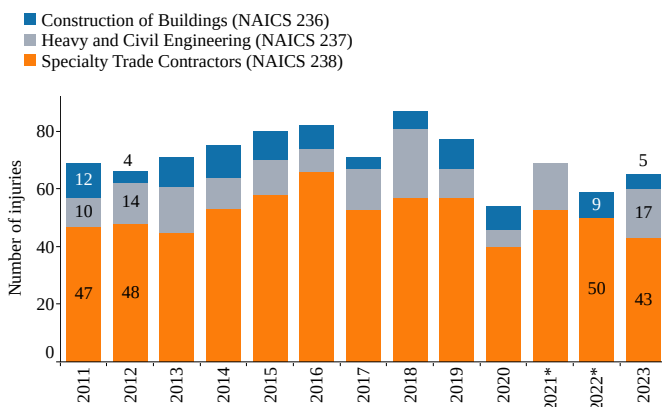


Source: U.S. Bureau of Labor Statistics, 2023 Census of Fatal Occupational Injuries and Illnesses.

^Indirect exposure: 220 volts or less is unavailable.

Fatal electrical injuries were then analyzed by *major subsector* in construction (Chart 43c). From 2011 to 2023, an average of 52 fatal injuries occurred annually among workers at Specialty Trade Contractors (NAICS 238). During years with data, there were an annual average of 13 and 8 fatal injuries at firms in Heavy and Civil Engineering (NAICS 237) and Construction of Buildings (NAICS 236), respectively. These figures align with occupations under NAICS 238, including electricians, who are typically classified under Electrical Contractors and Other Wiring Installation Contractors (NAICS 238210), whose primary activity is installing and servicing electrical wiring and equipment (U.S. Census Bureau, n.d.).

Chart 43c. Fatal electrical injuries, by major subsector (2011-2023*)

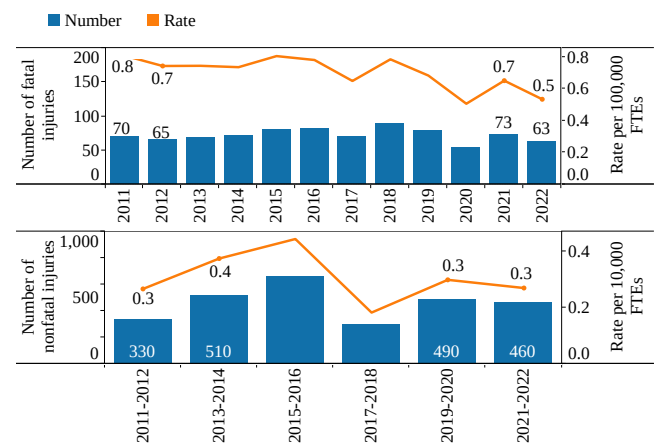


Source: U.S. Bureau of Labor Statistics, 2011-2023 Census of Fatal Occupational Injuries.

*Data is unavailable for Construction of Buildings (NAICS 236) in 2021 and Heavy and Civil Engineering (NAICS 237) in 2022 due to data suppression.

Next, the number and rate of electrocutions or electric shocks were examined for fatal and nonfatal injuries. Fatalities involving electrocutions or electric shocks decreased 10.0% (70 to 63; Chart 43d) from 2011 to 2022. Meanwhile, the number of nonfatal electrocutions or electric shocks, which were compiled over two-year periods, increased 39.4% (330 to 460), but the rate remained the same (0.3 per 10,000 FTEs). The year 2018 had the highest number of fatalities (n=89), and the 2015-2016 period had the highest number of nonfatal injuries (n=660).

Chart 43d. Fatal and nonfatal electrocutions or electric shocks in construction (2011-2022*)



Source: U.S. Bureau of Labor Statistics, 2011-2022 Census of Fatal Occupational Injuries, 2011-2022 Survey of Occupational Injuries and Illnesses, and IPUMS, 2011-2022 Current Population Survey.

*SOII presented using two-year estimates to match 2021-2022 data changes.

TAKEAWAYS

Despite decreases in their number and rate from 2011 to 2023, electrical injuries are still a leading cause of fatalities in construction. Construction has one of the highest risks of electrical hazards compared to other industries due to the nature of the work, but these hazards are preventable (Earnest et al., 2019).

OSHA highlights that workers may be unaware of electrical hazards on the jobsite, with the most common hazards being contact with power lines, lack of ground-fault protection, path ground issues, improperly used equipment, and improperly used extension cords (OSHA n.d.). CPWR's Electrical Task Analysis resources contains task-specific conditions and recommendations which address safety and health hazards while electrical tasks are taking place (CPWR, n.d.a.).

RELATED CPWR PRODUCTS

- CPWR—The Center for Construction Research in Training. [2025]. Electrical Injuries in Construction. [dashboard]. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/injuries-illnesses-health/.
- CPWR—The Center for Construction Research in Training. [n.d.a.]. Electrical Task Analysis. www.cpwr.com/research/management-resources-from-research/electrical-task-analysis/.
 - This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by year and injury type.

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DEFINITIONS

- **Event/Exposure** – *The manner in which the injury or illness was produced or inflicted, such as a fall, heat-related illness, etc. For example, a worker was using a hand-held electric auger which struck a powerline would have a reported event or exposure of “Exposure to electricity,” with their reported primary source being “Tools, instruments, and equipment: Handtools-powered.” Full definitions for categories can be found in the [Occupational Injury and Illness Classification Manual](#).*
 - **Electrical injuries (OIICS 51)** – *The injury or illness resulting from contact with electricity, including electric shock and electrocutions.*
 - **Exposures greater than 220 volts (OIICS 5112 and OIICS 5122)** – Overhead voltage (e.g., power lines and industrial transformers) may operate at 220 volts or greater.
 - **Exposures 220 volts or less (OIICS 5111 and OIICS 5121)** – Household voltage should be at 220 volts or less.
- **Exposure type** – *Describes how contact was made with the electrical source based on the 3-digit event/exposure code.*
 - **Direct exposure (OIICS 511)** – *Contact made by directly touching the power source, such as a live wire.*
 - **Indirect exposure (OIICS 512)** – *Contact made by a conductive material touches an electricity source, such as a crane hitting a power line.*
- **Focus Four** – *Top four construction hazards as defined in 1994, including caught-in/between, electrocution, fall, and struck-by injuries.*
- **Full-time equivalent (FTEs)** – *Determined by the hours worked per employee on a full-time basis, defined as working 2,000 hours (40 hours x 50 weeks) per year.*
- **Major subsector** – *3-digit NAICS codes within construction. See Chapter 1 “Pulling and Classifying Data” for details.*
- **Nature** – *The physical characteristics of the work-related injury or illnesses. Full definitions for categories can be found in the [Occupational Injury and Illness Classification Manual](#).*
 - **Electrical burns (OIICS 153)** – *Nature of injury reported as burns resulting from electricity.*
 - **Electrocutions, electric shocks (OIICS 193)** – *Nature of injury reported as injuries resulting from contact with electric current.*
- **Wage-and-salary** – *Workers who receive wages, salaries, commissions, tips, or pay from their employer.*

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Transportation Injuries among Construction Workers

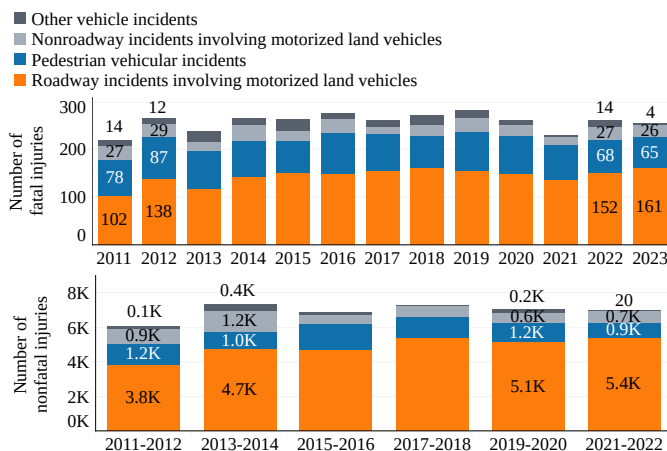
Due to the nature of their work, construction workers are at increased risk of being injured by a vehicle or mobile equipment. Vehicles and equipment pose collision and rollover risks that threaten both the operators and nearby workers.

Transportation incidents are a leading cause of injuries in construction, accounting for almost a quarter (23.3%) of fatalities at work in 2023 (BLS, n.d-a). In addition, two out of five (46.2%) fatal stuck-by injuries from 2011 to 2022 involved transport vehicles (CPWR, 2025). This chapter examines both fatal and nonfatal transportation injuries among U.S. construction workers. Two-year periods are used throughout for nonfatal injuries due to the Survey of Occupational Injuries and Illnesses (SOII) moving to biennial estimates for the latest reporting period.

FINDINGS

Fatal and nonfatal transportation injuries among U.S. construction workers were first evaluated by *event/exposure* (Chart 44a). There was a 15.8% increase in the overall number of fatal transportation injuries from 2011 to 2023 (221 to 256), and a 14.7% increase in nonfatal injuries from 2011-2012 to 2021-2022 (6.1K to 7.0K). During these periods, fatal injuries in construction overall increased, while overall nonfatal injuries decreased (Dufoe et al., 2025; Trueblood et al., 2022). Roadway incidents involving motorized land vehicles were the most prevalent event/exposure type, accounting for 55.9% of fatal and 70.2% of nonfatal injuries during the time periods examined. The second-most-common type was pedestrian vehicular incidents, which accounted for 29.0% of fatal and 16.9% of nonfatal injuries.

Chart 44a. Number of fatal and nonfatal transportation incident injuries in construction, by event/exposure (2011-2023*)

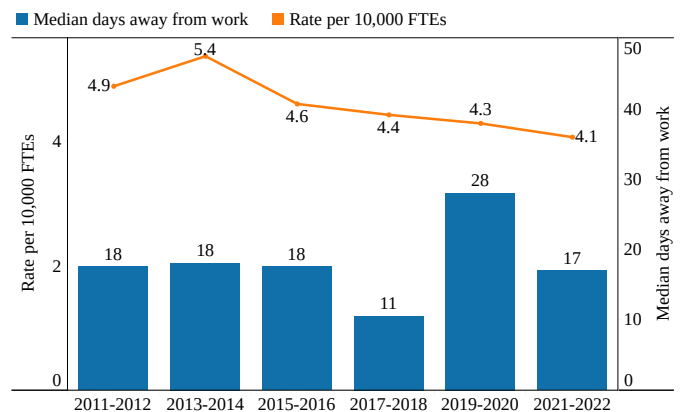


Source: U.S. Bureau of Labor Statistics, 2011-2023 Census of Fatal Occupational Injuries and 2011-2022 Survey of Occupational Injuries and Illnesses.

*SOII data switched to biennial estimates in 2021. Latest data available is 2021-2022.

Next, the rate and median *days away from work (DAFW)* for nonfatal transportation injuries were analyzed (Chart 44b). Although the number of nonfatal transportation injuries increased from 2011-2012 to 2021-2022, the rate and median DAFW decreased 16.3% and 5.6%, respectively. The nonfatal transportation injury rate was highest in 2013-2014 (5.4 per 10,000 *full-time equivalents (FTEs)*), while the median DAFW was highest in 2019-2020 (n=28).

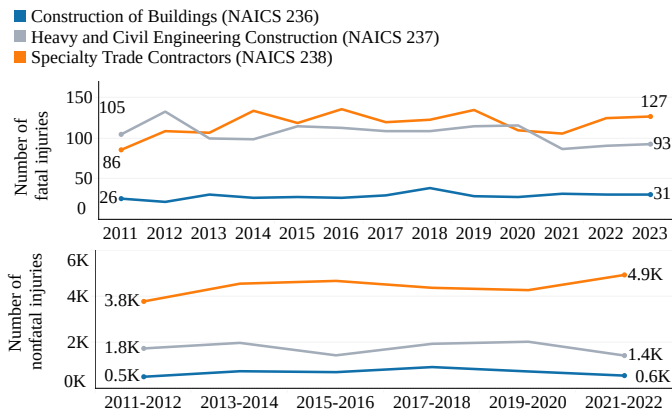
Chart 44b. Rate and median days away from work for nonfatal transportation incident injuries in construction, by year (Private industry; 2011-2022)



Source: U.S. Bureau of Labor Statistics, 2011-2022 Survey of Occupational Injuries and Illnesses and IPUMS, 2011-2022 Current Population Survey.

Transportation injuries were then assessed by major subsector (Chart 44c). From 2011 to 2023, the largest number of fatal transportation injuries occurred among workers at Specialty Trade Contractors (NAICS 238), with transportation fatalities in Heavy and Civil Engineering Construction (NAICS 237) following closely behind, 127 versus 93. Although workers in Heavy and Civil Engineering (NAICS 237) had fewer fatal injuries overall than Specialty Trade Contractors (NAICS 238), the high number of transportation fatalities among these workers makes sense given they tend to work on or near roadways (Trueblood et al., 2022). Prior research has also shown that these workers were more likely to be fatally struck by a vehicle than those in the other two major subsectors (Brown et al., 2021).

Chart 44c. Transportation incident injuries, by major construction subsector and year (Private industry; 2011-2023*)

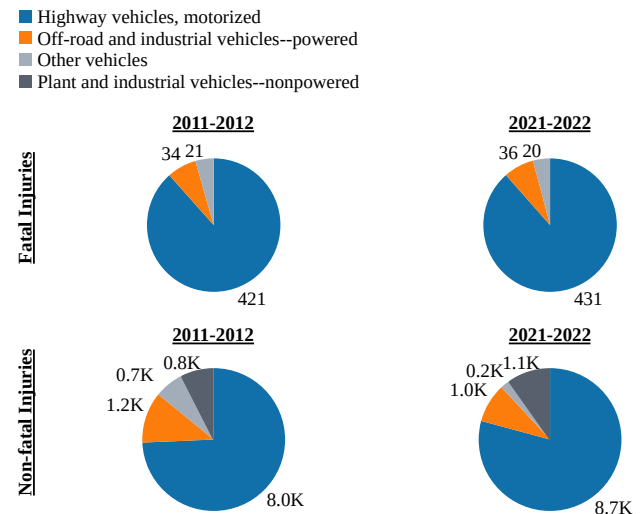


Source: U.S. Bureau of Labor Statistics, 2011-2023 Census of Fatal Occupational Injuries and 2011-2022 Survey of Occupational Injuries and Illnesses.

*SOII data switched to biennial estimates in 2021. Latest data available is 2021-2022.

Lastly, the number of transportation injuries were evaluated by selected vehicle *primary sources*. Motorized highway vehicles were the most common fatal and nonfatal injury vehicle source, followed by powered off-road and industrial vehicles. Non-powered plant and industrial vehicles were the third most prevalent nonfatal injury vehicle source. From 2011-2012 to 2021-2022, fatal construction injuries increased for motorized highway vehicles (+2.4%) and powered off-road and industrial vehicles (+5.9%) but decreased 4.8% for other vehicles. From 2011-2012 to 2021-2022, nonfatal construction injuries increased for motorized highway vehicles (+8.8%) and non-powered plant and industrial vehicles (+37.5%) sources and decreased 16.7% for powered off-road and industrial vehicles and 71.4% for other vehicles.

Chart 44d. Selected vehicle sources for all fatal and nonfatal construction injuries (2011-2012 and 2021-2022)



Source: U.S. Bureau of Labor Statistics, 2011-2022 Census of Fatal Occupational Injuries and 2011-2022 Survey of Occupational Injuries and Illnesses.

TAKEAWAYS

In construction, the number of fatal and nonfatal transportation injuries have trended upward since 2011. However, the overall rate and median days away from work for nonfatal transportation injuries decreased over time. Although the Heavy and Civil Engineering (NAICS 237) sector accounts for the smallest proportion of construction workers, the number of fatal transportation injuries among them was nearly as high as Specialty Trade Contractors (NAICS 238).

These findings highlight the continued need for transportation safety and prevention efforts in construction overall, as well as among workers disproportionately affected by these injuries, particularly those in Heavy and Civil Engineering (NAICS 237).

RELATED CPWR PRODUCTS

- CPWR–The Center for Construction Research. [n.d.]. Injury Data Dashboards. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/injuries-illnesses-health/.
 - This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by year and injury type.

- Trueblood, A.B., Harris, W., Yohannes, T. [2024, July]. Fatal Injury Trends in the Construction Industry, 2011-2022. www.cpwr.com/wp-content/uploads/DataBulletin-July2024.pdf.

DEFINITIONS

- **Days away from work (DAFW)** – Nonfatal injury cases resulting in at least one day away from work beyond the day of injury or illness onset.
- **Event or exposure** – the manner in which the injury or illness was produced or inflicted, such as fall, heat-related illness, etc. Definitions and examples can be found in the [Occupational Injury and Illness Classification Manual](#).
- **Full-time equivalent worker (FTEs)** – Determined by the hours worked per employee on a full-time basis, defined as working 2,000 hours (40 hours x 50 weeks) per year.
- **Primary source** – the objects, substances, equipment, and other factors that were responsible for the injury or illness incurred by the worker. For example, a worker who was climbing up a ladder when they slipped and fell would have a reported primary source of, “Ladders.” For more details, see [Occupational Injury and Illness Classification Manual](#).
- **Transportation incident** – Injuries with event/exposure code reported as OIICS 2, which includes events involving “transportation vehicles, animals used for transportation purposes and powered industrial vehicles or powered mobile industrial equipment and the injury or illness was due to a collision or other type of traffic incident” (BLS, n.d-b).

DATA SOURCES AND NOTES

Sarah Flood, Miriam King, Renae Rodgers, Steven Ruggles, J. Robert Warren, and Michael Westberry. Integrated Public Use Microdata Series, 2011-2022 Current Population Survey: Version 9.0 [dataset]. Minneapolis, MN: IPUMS, 2024. doi.org/10.18128/D030.V9.0.

U.S. Bureau of Labor Statistics (BLS). (2025). 2011-2023 Census of Fatal Occupational Injuries. www.bls.gov/iif/home.htm.

U.S. Bureau of Labor Statistics (BLS). (2025). 2021-2022 Survey of Occupational Injuries and Illnesses. www.bls.gov/iif/home.htm.

- All charts show injuries among private industry workers based on data availability.
- Two-year estimates are used throughout due to SOII moving to biennial estimates for the latest reporting period.

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Brown, S. Harris, W., Brooks, R.D., Dong, X.S. (2021, April). Fatal and Nonfatal Struck-by Injuries in the Construction Industry, 2011-2019. www.cpwr.com/wp-content/uploads/DataBulletin-April2021.pdf.

CPWR–The Center for Construction Research. (2025). Focus Four Injuries. [dashboard]. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/injuries-illnesses-health/.

Dufoe, D., Trueblood, A., Brooks, R.D., Harris, W. (2025, April). Construction Worker Injuries, Overdoses, and Suicides. www.cpwr.com/wp-content/uploads/DataBulletin-April2025.pdf.

Trueblood, A.B., Brown, S., Harris, W., (2022, May). Fatal and Nonfatal Injuries in the Construction Industry. www.cpwr.com/wp-content/uploads/DataBulletin-May2022.pdf.

U.S. Bureau of Labor Statistics (BLS). (n.d.-a). Census of Fatal Occupational Injuries (2023 forward). www.bls.gov/iif/data.htm.

U.S. Bureau of Labor Statistics. (n.d.-b). Section 2.4 Event or Exposure. www.bls.gov/iif/definitions/oics-manual-2010-section-2-4.pdf.

Musculoskeletal Disorders (MSDs)

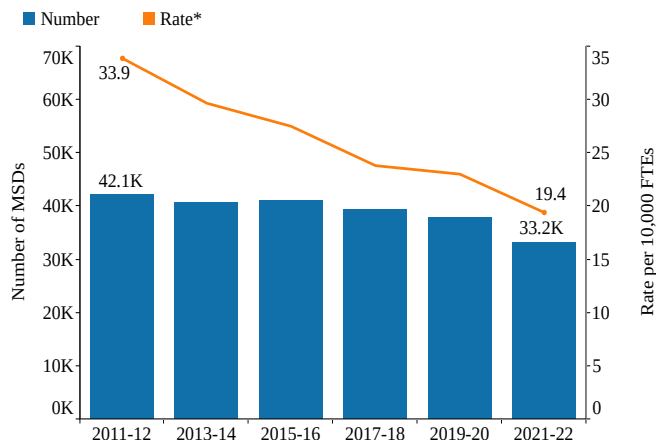
Construction workers are at higher risk for *musculoskeletal disorders (MSDs)* because of the nature of their job tasks, which include repetitive motions and awkward postures (Le et al., 2023). MSDs are one of the most frequently reported causes of lost or restricted work time and can result in pain and loss of function, both of which can lead to disability and impact workers' day-to-day lives (NAS, 2020; OSHA, n.d.). Construction workers with MSDs are also more likely to use opioids, a significant concern as the industry has one of the highest overdose rates (Billock et al., 2023; Dong et al., 2020).

This chapter presents recent trends of MSDs among construction workers. U.S. Bureau of Labor Statistics (BLS) Survey of Occupational Injuries and Illnesses (SOII) data was used, which may underreport MSDs (Miller, 2008). Despite this limitation, SOII data allows us to track MSD trends by industry.

FINDINGS

From 2011 to 2022, there was a 21.1% decrease in reported MSDs resulting in *days away from work (DAFW)* (42.1 thousand (K) to 33.2K) among construction workers, while the rate decreased 42.8% during the same period (33.9 to 19.4 per 10,000 *full-time equivalent (FTEs)*); Chart 45a).

Chart 45a. MSDs in construction (2011-2022; private industry)

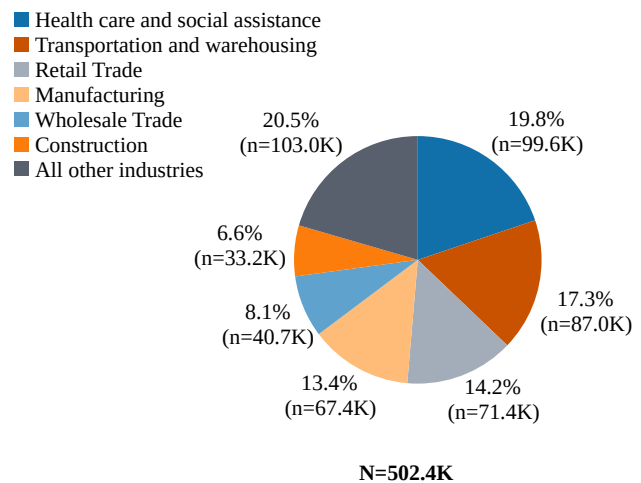


Source: U.S. Bureau of Labor Statistics, 2011-2022 Survey of Occupational Injuries and Illnesses and 2011-2022 IPUMS Current Population Survey.

*Due to the change to biennial estimates, rates in chart 45a are not comparable to those in chart 45c provided by BLS.

Among selected industries, construction workers reported the lowest number of MSDs resulting in DAFW (n=33.2K; Chart 45b). The highest number of MSDs were reported by health care and social assistance (n=99.6K), three times more MSDs than construction.

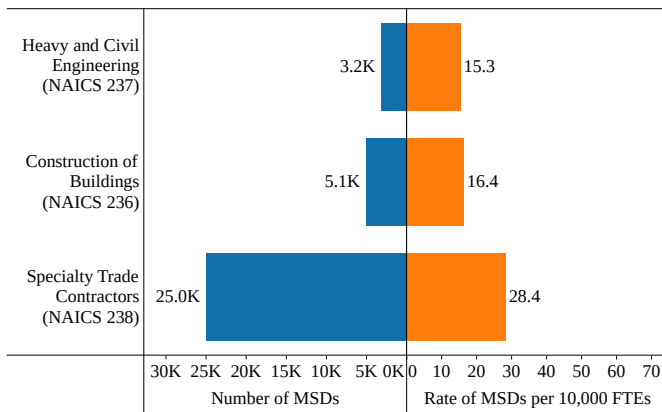
Chart 45b. MSDs, by major industry (2021-2022; private industry)



Source: U.S. Bureau of Labor Statistics, 2021-2022 Survey of Occupational Injuries and Illnesses.

By major subsector, Specialty Trade Contractors (NAICS 238) had the largest number and rate of MSDs resulting in DAFW (25.0K; 28.4 per 10,000 FTEs; Chart 45c). Next in both number and rate were Construction of Buildings (NAICS 236) workers, with 5.1K MSDs resulting in DAFW with a rate of 16.4 per 10,000 FTEs. The lowest number and rate of MSDs were among workers in Heavy and Civil Engineering (NAICS 237) workers, 3.2K injuries and a rate of 15.3 per 10,000 FTEs.

**Chart 45c. MSDs, by major construction subsector*
(2021-2022; private industry)**



Source: U.S. Bureau of Labor Statistics, 2021-2022 Survey of Occupational Injuries and Illnesses.

*Due to the change to biennial estimates, rates in chart 45a are not comparable to those in chart 45a provided by BLS.

TAKEAWAYS

Although the number and rate of MSDs among construction workers requiring days away from work have decreased since 2011, the number of these injuries remain substantial, with 33.2K MSD injuries from 2021 to 2022. Rates of MSDs, which can lead to long-term disability and disruptions to daily life, were particularly high among Specialty Trade Contractors (NAICS 238; 28.4 per 10,000 FTEs). It is important to understand the reasons for the declines in MSDs so they can be shared, which can both continue the reductions in these injuries and in the potential need for opioids to treat the associated pain.

RELATED CPWR PRODUCTS

- CPWR—The Center for Construction Research.[n.d.]. Best Built Plans. www.cpwr.com/research/research-to-practice-r2p/r2p-library/other-resources-forstakeholders/best-built-plans/.
- CPWR—The Center for Construction Research and Training. [2025]. Musculoskeletal Disorders in Construction. [dashboard]. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/injuries-illnesses-health/.
- CPWR—The Center for Construction Research and Training. [n.d.]. Pre-Task Planning (PTP) Guidelines and Resources for Construction. www.cpwr.com/research/managementresources-from-research/pre-task-planning-guidelines-andresources/.
- Harris, W., Dufoe, D., Brooks, R.D., Trueblood, A.B. [2025]. Musculoskeletal Disorder (MSD) Trends in Construction. www.cpwr.com/wp-content/uploads/DataBulletin-June2025.pdf.
 - This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by time period.

DEFINITIONS

- **Days away from work (DAFW)** – Nonfatal injury cases resulting in at least one day away from work beyond the day of injury or illness onset.
- **Full-time equivalent worker (FTEs)** – Determined by the hours worked per employee on a full-time basis, defined as working 2,000 hours (40 hours x 50 weeks) per year.
- **Major subsector** – 3-digit NAICS code within construction (NAICS 23). See Chapter 1 "Pulling and Classifying Data" for details.
- **Musculoskeletal disorders (MSDs)** – Injuries and/or pain that occur in joints, ligaments, muscles, nerves, tendons and other areas of the limbs, neck, or back.

DATA SOURCES AND NOTES

Sarah Flood, Miriam King, Renae Rodgers, Steven Ruggles, J. Robert Warren, and Michael Westberry. Integrated Public Use Microdata Series, 2011-2022 Current Population Survey: Version 9.0 [dataset]. Minneapolis, MN: IPUMS, 2024. doi.org/10.18128/D030.V9.0.

U.S. Bureau of Labor Statistics (BLS). (2025). 2021-2022 Survey of Occupational Injuries and Illnesses. www.bls.gov/iif.

- SOII data shows injuries among private wage-and-salary workers.
- Two-year estimates are used throughout due to SOII moving to biennial estimates for the latest reporting period.

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Dong, S. X., Brooks, R. D., Brown, S. (2020). Musculoskeletal disorders and prescription opioid use among U.S. construction workers. Journal of Occupational and Environmental Medicine. journals.lww.com/joem/abstract/2020/11000/musculoskeletal_disorders_and_prescription_opioid.13.aspx.

Le, A.B., Trout, D., Dale, A.M., & Earnest, S. (2023, Feb 15). Psychosocial Hazards Often Overlooked in Construction Industry. blogs.cdc.gov/niosh-science-blog/2023/02/15/construction-psychosocial-hazards/.

Miller, G. (2008). Hidden Tragedy: Underreporting of workplace injuries and illnesses. www.bls.gov/iif/dataquality-research/hidden-tragedy-underreporting-of-workplaceinjuries-and-illnesses.pdf.

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Back Injuries in Construction and Other Industries

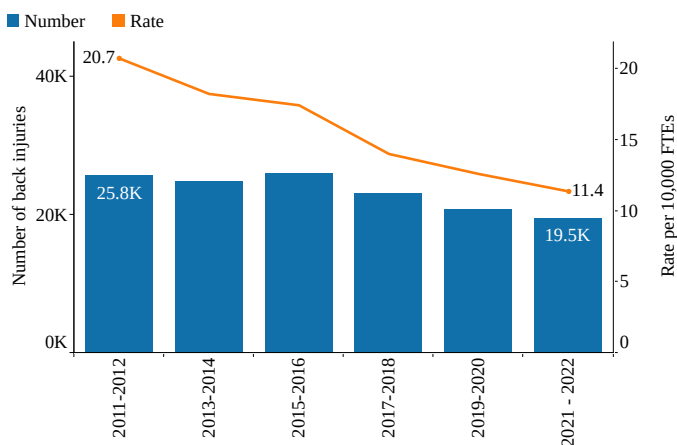
Back pain and related issues are common in construction, as the industry's workers often do physically demanding and repetitive tasks (Dong et al., 2013). From 2021 to 2022, *back injuries* were the second most common *part of body* involved in injuries among construction workers, accounting for 13.5% of all nonfatal injuries requiring *days away from work* (DAFW; data not shown), behind only injuries affecting hands (16.4%).

It is important to monitor back injuries among construction workers, as prior research found a link between back pain and prescription opioid use among construction workers (Dong et al., 2022), which is concerning given the industry has one of the highest overdose rates (Billock et al., 2023). This chapter examines back injuries resulting in days away from work among U.S. construction workers by year, major subsector, and occupation. Back injuries in construction are also compared with other industries. As a note, two-year estimates are used throughout due to SOII moving to biennial estimates for the latest reporting period.

FINDINGS

From 2011-2012 to 2021-2022, the number and rate of back injuries resulting in DAFW among construction workers declined 24.4% and 44.9%, respectively (Chart 46a). Although the number of back injuries in 2015-2016 (n=26.0 thousand (K)) was slightly higher than in 2011-2012 (n=25.8K), the rate of back injuries in 2015-2016 (17.4 per 10,000 *full-time equivalents* (FTEs)) was lower than in 2011-2012 (20.7 per 10,000 FTEs). A similar trend was observed for all nonfatal injuries in construction (Dufoe et al., 2025).

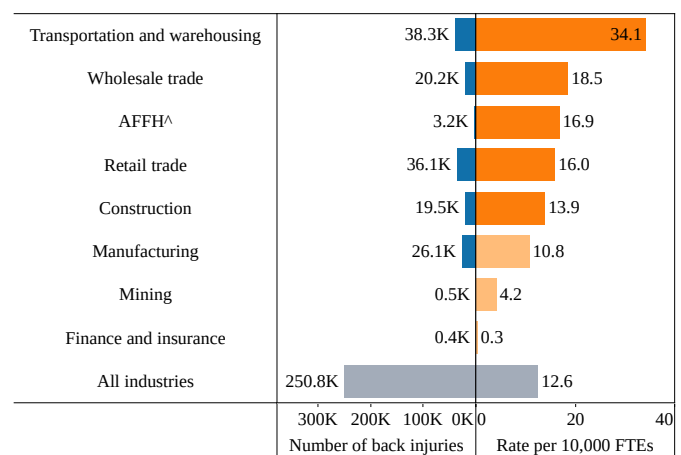
Chart 46a. Number and rate of back injuries in construction (2011-2022)



Source: U.S. Bureau of Labor Statistics, 2011-2022 Survey of Occupational Injuries and Illnesses and IPUMS, 2011-2022 Current Population Survey.

Next, the number and rate of back injuries during 2021-2022 were examined by industry (Chart 46b). During this period, construction (13.9 per 10,000 FTEs) and four other industries—transportation and warehousing (34.1 per 10,000 FTEs), wholesale trade (18.5 per 10,000 FTEs), agriculture (16.9 per 10,000 FTEs), and retail trade (16.0 per 10,000 FTEs)—had higher rates of back injury than all industries combined (12.6 per 10,000 FTEs). Since 2010, the rate of back injuries in construction decreased 43.3%, going from third-highest of any industry (24.5 per 10,000 FTEs) to sixth-highest in 2021-2022 (CPWR, 2018). Construction also had the sixth-highest number of back injuries in 2021-2022.

Chart 46b. Number and rate* of back injuries, by industry (2021-2022)



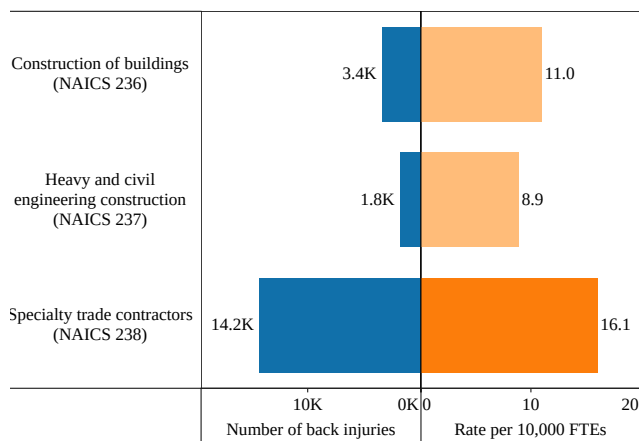
Source: U.S. Bureau of Labor Statistics, 2021-2022 Survey of Occupational Injuries and Illnesses.

*Dark orange bars indicate higher rate than all industries (12.6 per 10,000 FTEs) and light orange bars indicate those with lower rates.

^Agriculture, Forestry, Fishing and Hunting.

Back injuries were analyzed by major subsector (Chart 46c). During 2021-2022, the number and rate of back injuries were highest among workers in Specialty Trade Contractors (NAICS 238; 14.2K injuries; 16.1 per 10,000 FTEs), followed by Construction of Buildings (NAICS 236; 3.4K injuries; 11.0 per 10,000 FTEs) and Heavy and Civil Engineering Construction (NAICS 237; 1.8K injuries; 8.9 per 10,000 FTEs). The distribution of back injuries is similar to that of all nonfatal injuries, in which most injuries were among Specialty Trade Contractors (NAICS 238; Dufoe et al., 2025). These findings are not too surprising, given Specialty Trade Contractors (NAICS 238) account for the greatest proportion of construction workers (Harris et al., 2022).

Chart 46c. Number and rate* of back injuries in construction, by major subsector (2021-2022)

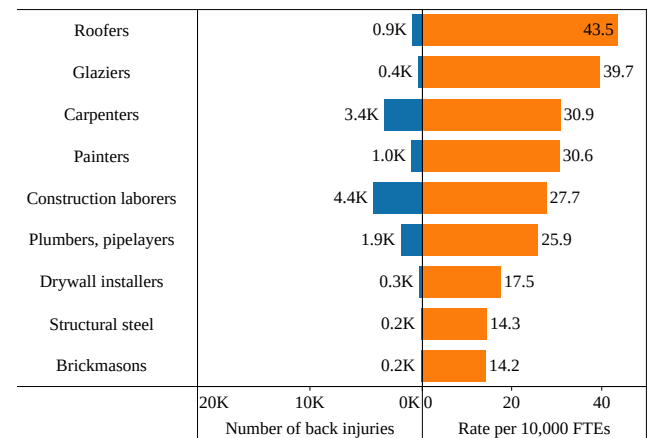


Source: U.S. Bureau of Labor Statistics, 2021-2022 Survey of Occupational Injuries and Illnesses.

*The dark orange bar indicates higher rate than all construction (13.9 per 10,000 FTEs) and light orange bars indicate those with lower rates.

The number and rate of back injuries during 2021-2022 were also examined by construction occupation (Chart 46d). The number of back injuries during this period were highest among construction laborers (n=4.4K), carpenters (n=3.4K), plumbers and pipelayers (n=1.9K), painters (n=1.0K), and roofers (n=0.9K). Meanwhile, roofers (43.5 per 10,000 FTEs), glaziers (39.7 per 10,000 FTEs), carpenters (30.9 per 10,000 FTEs), painters (30.6 per 10,000 FTEs) and construction laborers (27.7 per 10,000 FTEs) had particularly high injury rates.

Chart 46d. Number and rate* of back injuries, by select occupations (2021-2022)



Source: U.S. Bureau of Labor Statistics, 2021-2022 Survey of Occupational Injuries and Illnesses.

*The rate for all construction is 13.9 per 10,000 FTEs.

TAKEAWAYS

Although the number and rate of back injuries requiring days away from work in construction decreased over time, construction workers continue to suffer these injuries at a higher-than-average rate (13.9 per 10,000 FTEs for construction versus 12.6 per 10,000 FTEs for all industries). Injury rates were particularly high among Specialty Trades Contractors (NAICS 238; 16.1 per 10,000 FTEs) and for certain occupations, such as roofers (43.5 per 10,000 FTEs) and glaziers (39.7 per 10,000 FTEs). While significant progress has been made in reducing back injuries in construction, it is important to understand the reasons behind these improvements so they can be shared throughout the industry and used to continually reduce these injuries.

Back injuries are the second most common injury in construction and are associated with opioid use. For this reason, it is important to continue targeted prevention efforts, especially among aging construction workers and those in occupations with higher rates of back injury.

RELATED CPWR PRODUCTS

- CPWR–The Center for Construction Research. [n.d.]. Back Injuries Hazard Alert Card. www.cpwr.com/research/research-to-practice-r2p/r2p-library/hazard-alert-cards/.
- CPWR–The Center for Construction Research. [2025]. Musculoskeletal Disorders (MSDs) in Construction. [dashboard]. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/injuries-illnesses-health/.

DEFINITIONS

- **Back injuries** – *Nonfatal injuries resulting in days away from work that involved back as the impacted part of body.*
- **Days away from work (DAFW)** – *Nonfatal injury cases resulting in at least one day away from work beyond the day of injury or illness onset.*
- **Full-time equivalent worker (FTEs)** – *Determined by the hours worked per employee on a full-time basis, defined as working 2,000 hours (40 hours x 50 weeks) per year.*
- **Part of body** – *The specific area of the body where the injury or illness occurred.*

DATA SOURCES AND NOTES

Sarah Flood, Miriam King, Renae Rodgers, Steven Ruggles, J. Robert Warren, and Michael Westberry. Integrated Public Use Microdata Series, 2011-2022 Current Population Survey: Version 9.0 [dataset]. Minneapolis, MN: IPUMS, 2024. doi.org/10.18128/D030.V9.0.

U.S. Bureau of Labor Statistics (BLS). (2025). 2021-2022 Survey of Occupational Injuries and Illnesses. www.bls.gov/iif/home.htm.

- All charts show injuries among private industry workers based on data availability.
- Two-year estimates are used throughout due to SOII moving to biennial estimates for the latest reporting period.

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Dong, X. S., Wang, X., Fujimoto, A., & Dobbin, R. (2012). Chronic back pain among older construction workers in the United States: a longitudinal study. *International journal of occupational and environmental health*, 18(2), 99-109. doi.org/10.1179/1077352512Z.0000000004.

Dong, X. S., Brooks, R. D., Rodman, C., Rinehart, R., & Brown, S. (2022). Pain and prescription opioid use among US construction workers: Findings from the 2011–2018 Medical Expenditure Panel Survey. *American journal of public health*, 112(S1), S77-S87. doi.org/10.2105/ajph.2021.306510.

Dufoe, D., Trueblood, A., Brooks, R.D., Harris, W. (2025, April). Construction Worker Injuries, Overdoses, and Suicides. www.cpwr.com/wp-content/uploads/DataBulletin-April2025.pdf.

Harris, W., Brown, S., Trueblood, A.B. (2022, March). Employment Trends and Projections in Construction. www.cpwr.com/wp-content/uploads/DataBulletin-March2022.pdf.

Hearing Loss and Tinnitus in Construction and All Industries

Hearing loss impacts day-to-day activities and can impact aging, with recent research showing, for example, that it can play a role in dementia (Bloomberg School of Public Health, 2021). It is the third most common chronic health issue affecting adults, following high blood pressure and arthritis.

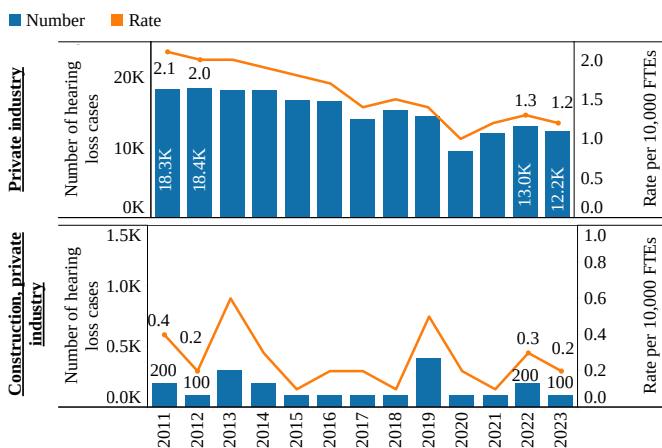
It is particularly important to monitor noise exposures for construction workers, as estimates show about half of them have been exposed to levels that can damage hearing (Kerns et al., 2018; NIOSH, 2024). Prior studies have found that construction trade workers were 40% more likely to have hearing impairment than the reference group of non-trade workers (Ringen et al., 2022).

This chapter examines hearing loss illnesses, hearing difficulty, hearing status, and *tinnitus* by industry. Fully measuring the levels of hearing loss is difficult because of the limitations of the available data sources, which are surveys and not comprehensive counts of illnesses. For example, the Survey of Occupational Injuries and Illnesses (SOII), a leading source for national estimates of nonfatal injuries in the United States, does not capture long-latency illnesses such as hearing loss that occur later in life (Miller, 2008). The Health and Retirement Study (HRS) and National Health Interview Survey (NHIS) both rely on *self-reported* measures to assess hearing and tinnitus. This chapter draws on all three sources which, despite their limitations, provide important information on hearing illnesses and hearing status that can be useful in monitoring trends.

FINDINGS

The estimated number of workers with hearing loss and the rate of hearing loss were examined first (Chart 47a). From 2011 to 2023, the number of hearing loss cases reported in the SOII decreased 50.0% in construction (200 to 100) and 33.3% in private industry overall (18.3K to 12.2K). The rate during this period decreased 50.0% for construction (0.4 to 0.2 per 10,000 *full-time equivalents (FTEs)*) and 42.9% for all private industry (2.1 to 1.2 per 10,000 FTEs). These figures align with recent findings that the risk of hearing loss has been declining (Masterson et al., 2016).

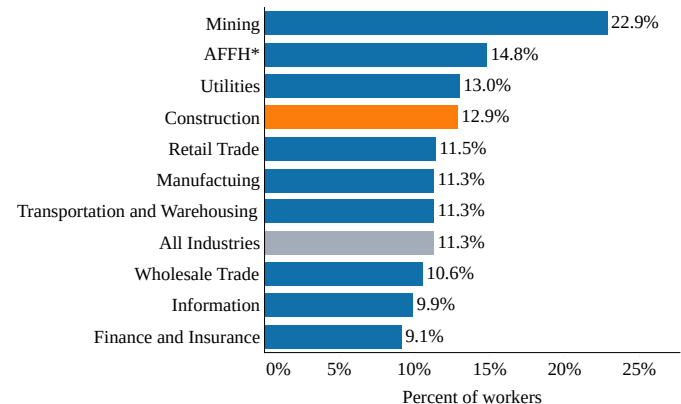
Chart 47a. Number and rate of hearing loss illnesses, by industry (2011-2023)



Source: U.S. Bureau of Labor Statistics, *Number of illnesses by category of illness and Illness rate by category of illness by industry*.

To try to account for hearing loss and issues not captured in SOII data, survey data from NHIS and HRS were used for data on self-reported hearing metrics. (Chart 47b). Mining had the highest percentage of workers reporting difficulty hearing (22.9%), with construction having the fourth highest percentage (12.9%), which was higher than the average across all industries (11.3%). The figure for construction aligns with research from 2014 in which 14.0% of the industry's workers reported hearing difficulty (Kerns et al., 2018).

Chart 47b. Self-reported hearing difficulty, by industry (2023)

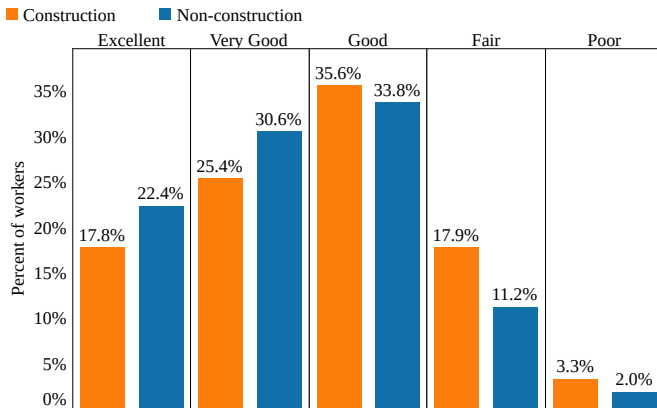


Source: National Center for Health Statistics, *2023 National Health Interview Survey*.

*Agriculture, Forestry, Fishing, and Hunting.

Next, hearing status was examined among adults 50 years or older (Chart 47c). Construction workers had a lower percentage of respondents who reported excellent (17.8% versus 22.4%) and very good (25.4% versus 30.6%) hearing than 50+ adults overall. Construction respondents were 1.6 times more likely to report fair hearing (17.9% versus 11.2%) and 1.7 times more likely to report poor hearing (3.3% versus 2.0%) than those not in construction.

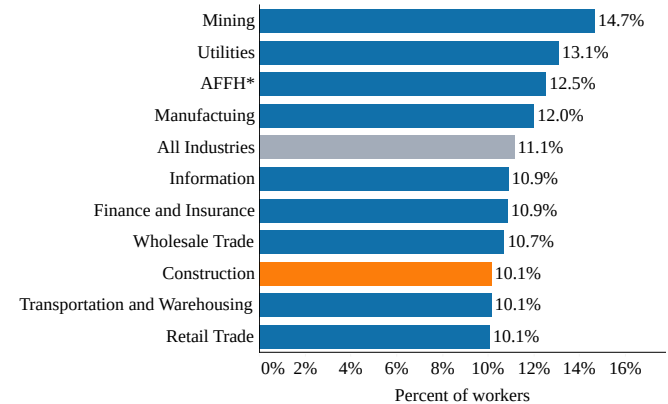
Chart 47c. Self-reported hearing status among adults 50 years or older, by industry (2012-2022)



Source: University of Michigan, 2012-2022 Health and Retirement Study HRS Core.

Construction workers had a lower-than-average rate of self-reported tinnitus in the past 12 months (10.1% compared to 11.1% for all industries; Chart 47d). Mining had the highest percentage of workers with tinnitus (14.7%).

Chart 47d. Self-reported tinnitus in the past 12 months, by industry (2023)



Source: National Center for Health Statistics, 2023 National Health Interview Survey.

*Agriculture, Forestry, Fishing, and Hunting.

TAKEAWAYS

While construction workers had lower number and rates of hearing loss than workers in general based on SOII data, they were more likely to report poor hearing and difficulty hearing. This apparent contradiction may be a result of the fact that SOII data does not capture either illnesses that take time to develop between exposure and onset of symptoms or exposures that slowly cause damage such as noise-induced hearing loss. Because of the impact hearing loss has on day-to-day life, as well as its role in potential dementia later in life, monitoring noise on construction jobsites remains important.

RELATED CPWR PRODUCTS

- CPWR—The Center for Construction Research. [n.d.]. Injury Data Dashboards. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/injuries-illnesses-health/.
- Dufoe, D., Trueblood, A., Brooks, R.D., Harris, W. [2025, April]. Construction Worker Injuries, Overdoses, and Suicides. www.cpwr.com/wp-content/uploads/DataBulletin-April2025.pdf.

DEFINITIONS

- **Full-time equivalent worker (FTEs)** – Determined by the hours worked per employee on a full-time basis, defined as working 2,000 hours (40 hours x 50 weeks) per year.
- **Self-reported** – Reported by a survey respondent, condition not diagnosed by a medical professional.
- **Tinnitus** – The perception of ringing in the ears or other sounds such as buzzing, hissing, and clicking.

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Respiratory Diseases in Construction

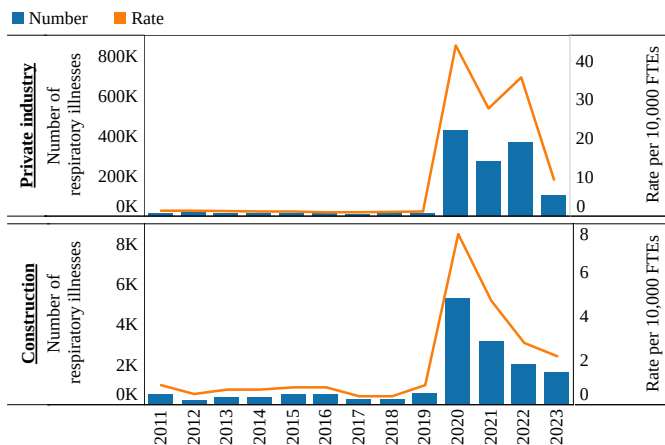
Construction tasks expose the industry's workers to dust, fumes, and gases that can cause acute and chronic respiratory problems (Boadu et al., 2023). Many of the respiratory hazards construction workers are exposed to can be prevented through engineering controls (e.g., ventilation), work practice controls (e.g., wet cutting), and administrative controls (minimizing the number of workers exposed; OSHA, n.d.).

This chapter examines respiratory conditions reported by employers in the Survey of Occupational Injuries and Illnesses (SOII), as well as *self-reported* conditions in the Health and Retirement Study (HRS) and National Health Interview Survey (NHIS).

FINDINGS

The number and rate of workers impacted by respiratory conditions by industry and year were examined first (Chart 48a). From 2011 to 2019, respiratory conditions stayed relatively constant in both construction and all industries. For all industries, from 2019 to 2020 the estimated number of cases rose 3,869.4% (10.8 thousand (K) to 428.7K) and the estimated rate 3,284.6% (1.3 to 44.0 per 10,000 *full-time equivalents (FTEs)*). Construction had smaller increases: 783.3% (600 to 5.3K) in number and 755.6% (0.9 to 7.7 per 10,000 FTEs) in rate. These increases are due to the *COVID-19 pandemic* which started in March 2020 (BLS, 2022). The number and rates of respiratory conditions decreased from 2021 to 2023. By the end of that period, there were 1.6K reported respiratory conditions among construction workers, with a rate of 2.2 per 10,000 FTEs. These conditions may not be fully captured in SOII data, as only cases that resulted in loss of consciousness, *days away from work*, restricted work activity/job transfer, or medical treatment beyond first aid are included (BLS, 2023).

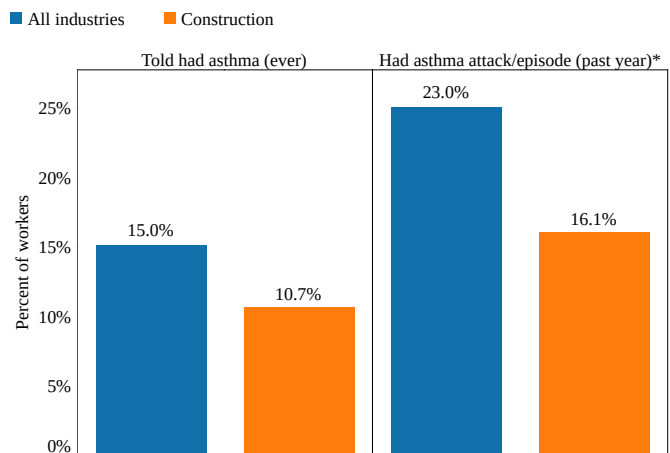
Chart 48a. Number and rate of respiratory illnesses, by industry (2011-2023)



Source: U.S. Bureau of Labor Statistics, Number of illnesses by category of illness and Illness rate by category of illness by industry.

NHIS and HRS data—which both include self-reported respiratory illnesses—were then examined to account for SOII data limitations, (Chart 48b-48d). While construction had a lower percentage of workers who reported asthma than all industries, one in ten (10.7%) construction workers still said in 2023 they had been told at some point they had asthma. Of those who were ever told they had asthma, 16.1% of construction workers reported having an asthma attack in the past year, compared to 23.0% of workers in all industries.

Chart 48b. Self-reported asthma, by industry (2023)

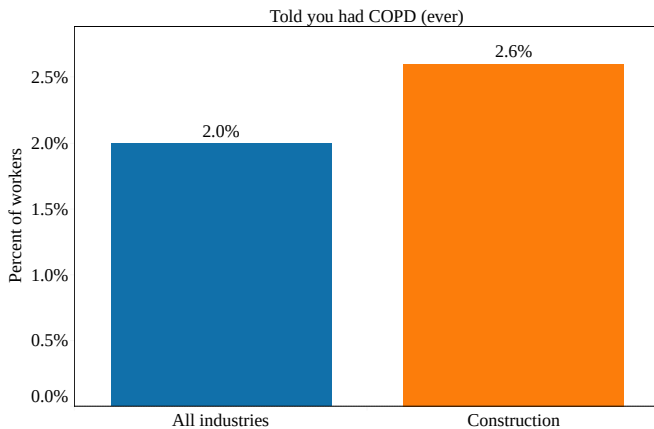


Source: IPUMS, 2023 National Health Interview Survey.

*For those who were ever told they had asthma.

Reported chronic obstructive pulmonary disease (COPD) was then analyzed (Chart 48c). Overall, 2% of all workers reported they had had COPD, as did 2.6% of construction workers in 2023.

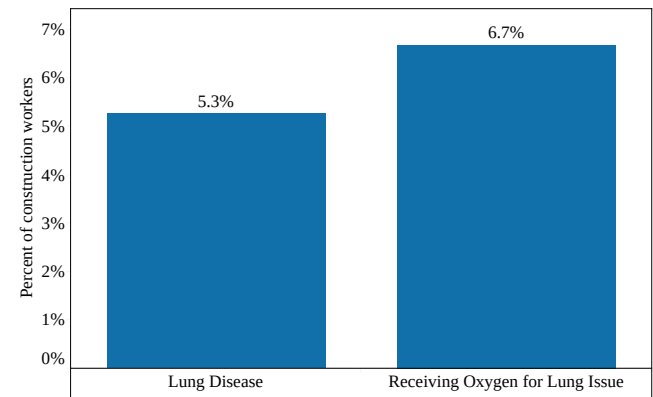
Chart 48c. Self-reported COPD, by industry (2023)



Source: IPUMS, 2023 National Health Interview Survey.

Next, HRS data on adults 50 years or older reporting lung disease (e.g., chronic bronchitis, emphysema) and/or receiving oxygen was examined (Chart 48d). Overall, 5.3% of those working in construction reported having a lung disease at some point from 2012 to 2022. In addition, 6.7% of those with a lung disease reported receiving oxygen for a lung condition.

Chart 48d. Self-reported lung disease and use of oxygen among construction workers 50 years or older (2012-2022)



Source: University of Michigan, 2012-2022 Health and Retirement Study HRS Core.

TAKEAWAYS

While construction workers had lower numbers and rates of respiratory conditions than workers in general based on SOII data, they frequently reported having chronic respiratory illnesses, including asthma and COPD, that impact day-to-day living, possibly including a need of supplemental oxygen. These findings highlight the need to continue to monitor respiratory conditions that impact construction workers. Through existing surveillance data, the burden of respiratory conditions resulting from COVID-19 could be monitored which allowed us to understand the impact on workers but also allows us to plan and forecast for future issues.

RELATED CPWR PRODUCTS

- CPWR—The Center for Construction Research and Training. [n.d.]. Exposure Control Database. ecd.cpwrconstructionsolutions.org/.
- CPWR—The Center for Construction Research and Training. [n.d.]. Physicians' Alert: Work-Related Asthma (WRA) among Construction Workers. www.cpwr.com/wp-content/uploads/publications/PhysiciansAlert-WRA.2018.pdf.

DEFINITIONS

- **COVID-19 Pandemic** – A global outbreak of coronavirus that resulted in quarantines and social distancing protocols starting in March 2020 throughout 2021.
- **Days away from work (DAFW)** – Nonfatal injury cases resulting in at least one day away from work beyond the day of injury or illness onset.
- **Full-time equivalent worker (FTEs)** – Determined by the hours worked per employee on a full-time basis, defined as working 2,000 hours (40 hours x 50 weeks) per year.
- **Self-reported** – Reported by a survey respondent, condition not diagnosed by a medical professional.

DATA SOURCES AND NOTES

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Leading Causes of Death

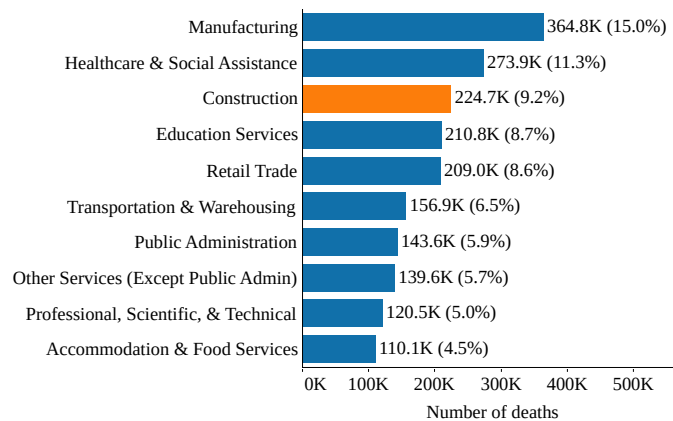
The impact of work on an individual's health extends beyond occupational injuries and acute illnesses. Examining death certificates by the decedent's occupation or industry can reveal longer-term trends in deaths and disease. Within the U.S., data on decedent industry and occupation were collected as early as 1870 with the decennial census, and recent efforts to harmonize industry and occupation data from different states into a national sample make it possible to examine all deaths among an industry's workers in a modern, national context (Steege et al., 2021).

Observing trends in all mortality by industry and occupation allows for the characterization of particular risks and the identification of mortality outcomes that may be work-related. Prior research examining data from 1984 to 1988 among 24 participating states identified several combinations of occupations and causes of death where these workers were overrepresented, including painters (malignant neoplasms of the esophagus), crane and tower operators (other ischemic heart disease), and construction helpers (pneumonia and influenza; Burnett et al., 1997). This chapter characterizes all deaths among current, retired, and former construction workers (those decedents whose usual *industry* was recorded as construction) in 2023, examining them by characteristics such as demographics, *manner of death*, and *occupation*.

FINDINGS

Among all decedents aged 16 years or older in 2023, construction was the industry with the third-highest number of deaths, with 224.7 thousand (K; Chart 49a). Construction followed only healthcare and social assistance (273.9K) and manufacturing (364.8K) by number of deaths, accounting for 9.2% of the 3.1 million deaths in 2023.

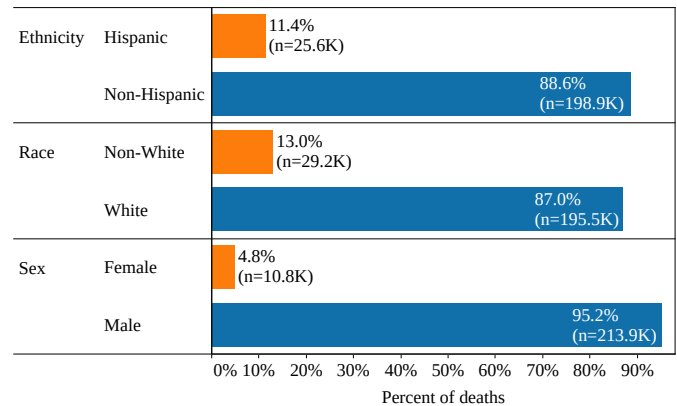
Chart 49a. Deaths by usual industry (2023)



Source: National Center for Health Statistics, 2023 Mortality Multiple Cause File.

Within construction, 11.4% of deaths were among Hispanic workers (n=25.6K; Chart 49b). By race, 13.0% (n=29.2K) of decedents were non-white, while only 4.8% (n=10.8K) were female.

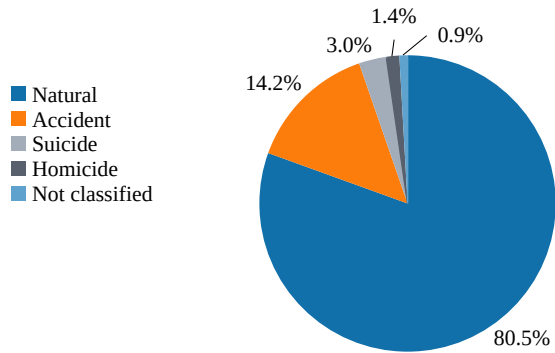
Chart 49b. Number and percent of deaths among construction workers, by demographics (2023)



Source: National Center for Health Statistics, 2023 Mortality Multiple Cause File.

By manner of death, a majority were natural deaths (80.5%), followed by accident (14.2%), suicide (3.0%), and homicide (1.4%; Chart 49c). For all industries, natural deaths accounted for 89.5% of all deaths, while accidents accounted for 7.5% of deaths (data not shown).

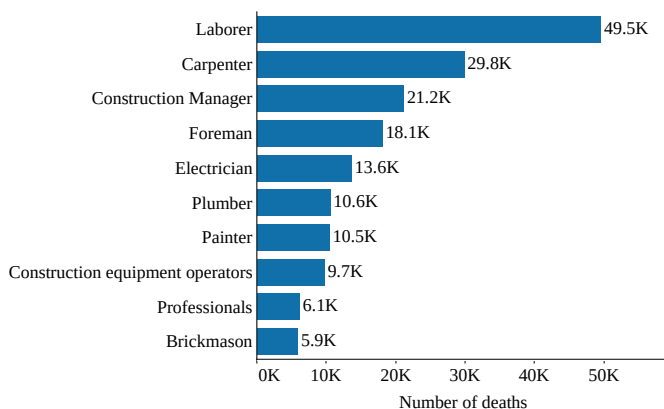
Chart 49c. Deaths in construction, by manner of death (2023)



Source: National Center for Health Statistics, 2023 Mortality Multiple Cause File.

By occupation, laborers had the greatest number of deaths in 2023, 49.5K (Chart 49d). Carpenters (29.8K), construction managers (21.2K), and foremen (18.2K) were the occupations with the next highest numbers. It is not unusual to see laborers, carpenters, and construction managers at the top, as they also represent some of the most common construction occupations (see Chapter 10).

Chart 49d. Top 10 occupations, by number of deaths in construction (2023)

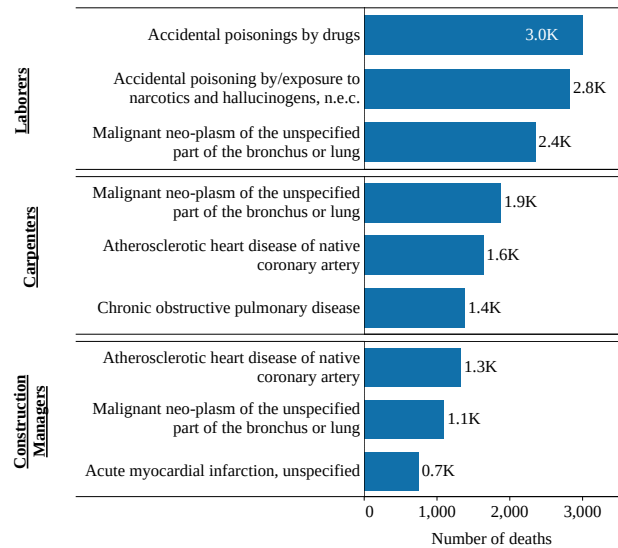


Source: National Center for Health Statistics, 2023 Mortality Multiple Cause File.

The top *causes of death* for these three occupations—laborers, carpenters, and construction managers—were then examined (Charts 49e). All occupations saw malignant neo-plasm of bronchus or lung, chronic obstructive pulmonary disease, and atherosclerotic heart disease of native coronary artery without angina pectoris (e.g., chest pain, discomfort) as primary

contributors to mortality. Laborers and carpenters both had accidental poisonings by drugs as one of the top five causes of death (3.0K and 1.1K respectively; data not shown).

Chart 49e. Top 3 causes of death among select occupations* (2023)

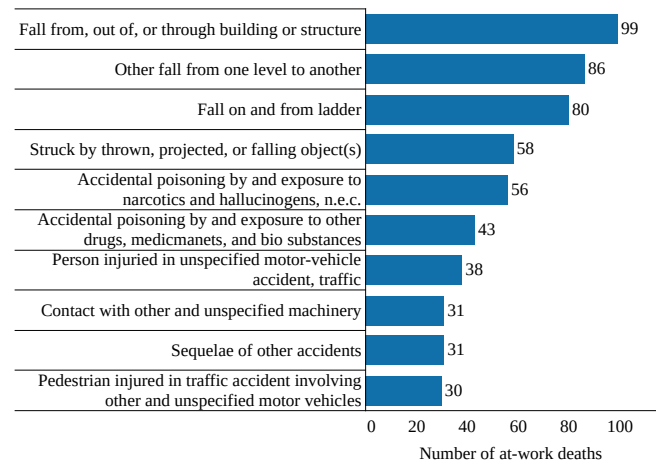


Source: National Center for Health Statistics, 2023 Mortality Multiple Cause File.

*Occupations chosen are the top three by number of deaths. Occupations not specific to those working in construction.

At-work fatalities among construction workers were also broken down by cause of death (Chart 49f). Falls accounted for three of the top ten at-work causes in construction: fall from, out of, or through building or structure (99 deaths), other fall from one level to another (86), fall on and from ladder (80). Next were struck by thrown, projected, or falling object(s) injuries (58), accidental poisoning by and exposure to narcotics and hallucinogens, not elsewhere classified (56), and accidental poisoning by and exposure to other drugs, medicaments, and bio substances (43).

Chart 49f. Causes of at-work deaths among construction workers (2023)



Source: National Center for Health Statistics, 2023 Mortality Multiple Cause File.

TAKEAWAYS

In 2023, there were 224.7K deaths among current, former, and retired construction workers. Of these deaths, 11.4% of the workers were Hispanic, 13.0% were non-white, and 4.8% were female. As expected, a majority of deaths were among the most populated occupations, laborers (99.0K deaths), carpenters (42.3K), and construction managers (36.2K). Analyzing each figure by the contributing causes of death found similarities in drug overdose deaths among laborers and carpenters, alongside causes of death more common throughout the general population, including diseases of the heart between all three occupations. Accidents accounted for 14.2% of deaths in construction, and overdoses were the fifth and sixth most common causes of at-work deaths.

Coupling industry and occupation information with death certificates allows for a more detailed view of the life-path of construction workers, as injuries and exposures extend beyond just time of employment that could guide intervention and prevention efforts. It is important to continue researching trends in industry and occupational mortality for these individuals as more data becomes available.

RELATED CPWR PRODUCTS

- CPWR—The Center for Construction Research and Training. [2025]. Construction Spending. [dashboard]. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/injuries-illnesses-health/.
 - This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by year and age.

DEFINITIONS

- **At-Work** – Indicates whether the death occurred while the decedent was at their place of work.
- **Causes of death (COD)** – The specific condition that caused the death based on the International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) diagnosis Code.
 - For information on contributing ICD-10 codes for specific causes of death, email us at datacenter@cpwr.com.
- **Industry/Occupation** – A decedent’s usual (i.e. most worked) industry/occupation.
- **Manner of death** – Categorization of death as:
 - **Accident** – Death resulting from unnatural causes, such as a motor vehicle crash.
 - **Natural** – Death resulting from a disease or natural process, such as heart attack.
 - **Not classified** – Death in which the manner is still to be investigated or those in which the manner could not be determined.
 - **Suicide** – Death resulting from an intentional self-inflicted injury with intent to die.

DATA SOURCES AND NOTES

National Center for Health Statistics. (2025). National Vital Statistics System (NVSS) 2023 Multiple Cause of Death Public Use Files.

- NVSS data does not capture employment status (full-time, unemployed, retired, etc.) at time of death.
- Construction workers are defined in NVSS data as those whose usual industry was construction, including individuals currently employed, retired, or no longer in the workforce.

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Steege, A. L., Billock, R., Miniño, A. (2021). Industry and occupation (I&O) data as applicable to mortality vital statistics, 2020: history, background, and control tables. www.cdc.gov/nchs/data/dvs/industry-and-occupation-data-mortality-2020.pdf.

Severe Injuries in Construction

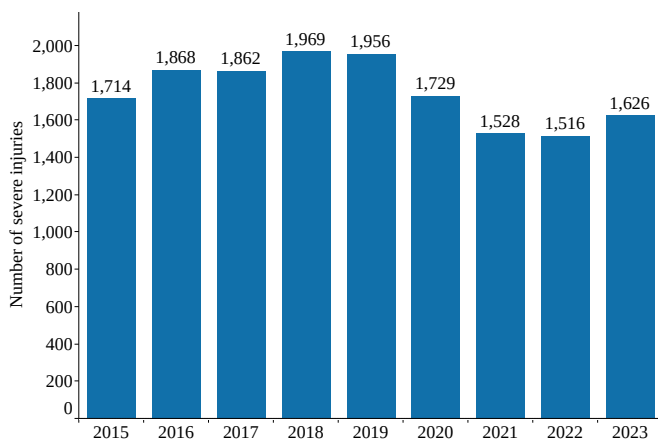
Since 2015, the Occupational Safety and Health Administration (OSHA) has required employers under its jurisdiction to report all *severe work-related injuries*, defined as an amputation, in-patient hospitalization, or loss of an eye (OSHA, n.d.). These reports contain detailed data: the type of injury, source of injury, body part affected, as well as injury narratives that describe the circumstances of the injury. Although these reports only cover those under federal OSHA jurisdiction (as many states have *state-run programs*). This data represents an extensive source of information on severe worker injuries in construction.

This data source, which previous Construction Chart Book editions have not used, represents a subset of nonfatal construction injuries, including those resulting in amputation, hospitalization, or loss of an eye. These reports present more serious injuries that tend to result in time away from work and potentially the development of chronic pain/conditions (Chen et al., 2012; Dong et al., 2022). The following charts characterize these injuries by year, *major subsector*, *event/exposure of injury*, and *source* (e.g. factor responsible for the injury).

FINDINGS

Since 2015, there have been over 15,000 severe injuries in construction in states under Federal OSHA jurisdiction, with the most reports (1,969) occurring in 2018 (Chart 50a). Most recently, annual severe injury reports increased 7.2% from 2022 to 2023 (1,516 to 1,626, respectively).

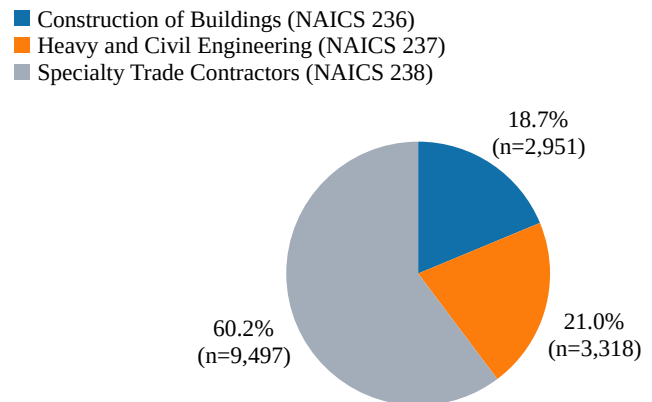
Chart 50a. Severe injuries in construction, by year (2015-2023)



Source: OSHA, 2015-2023 Severe Injury Reports.

When looking at major subsectors from 2015 to 2023, workers at Specialty Trade Contractors (NAICS 238) accounted for over half of severe injury reports (60.2%; n=9,497; Chart 50b). Heavy and Civil Engineering (NAICS 237) has the second highest number of severe injury reports, with 3,318 (21.0%) reports during that period, followed by Construction of Buildings (NAICS 236; n=2,951, 18.7%). Specialty Trade Contractors also represented a majority of all nonfatal injuries (see Chapter 38: Fatal and Nonfatal Injuries by Industry).

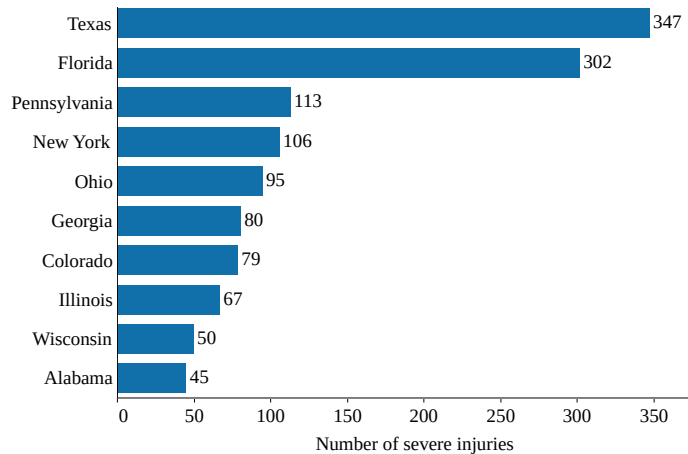
Chart 50b. Severe injuries, by major construction subsector (sum of 2015-2023)



Source: OSHA, 2015-2023 Severe Injury Reports.

Among states under federal jurisdiction, Texas had the highest annual average of severe injury reports—347—from 2015 to 2023 (Chart 50c). Florida had the second highest average, at 302. Given that these two states lead in injuries overall and construction employment, it is not surprising that they have historically had a higher number of severe injuries in construction.

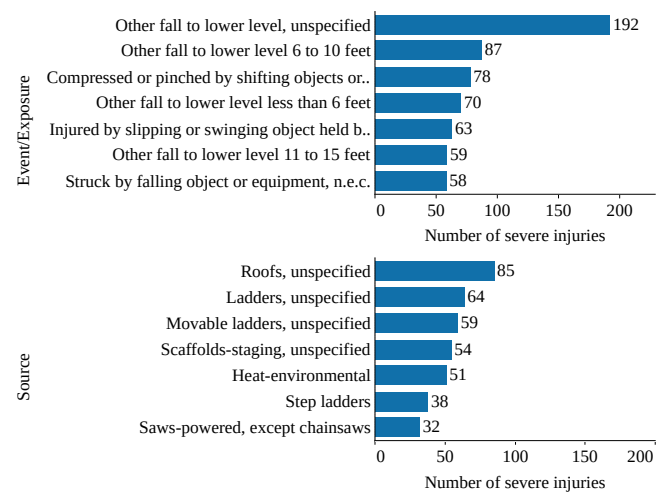
Chart 50c. Top 10 states, by average annual severe injuries (2015-2023)



Source: OSHA, 2015-2023 Severe Injury Reports.

In 2023, the most prevalent event/exposure among severe injuries in construction was “Other fall to lower level, unspecified,” with 192 injuries (Chart 50d). Four of the top seven events or exposures for severe injuries in 2023 were fall-related. These fall-related incidents accounted for 25.7% of all severe injuries in 2023 (n=408). Two struck-by injury codes, “injured by slipping or swinging object held by injured worker” and “struck by falling object or equipment, n.e.c.” together accounted for 121 injuries. In regard to source, “Roofs, unspecified” accounted for a majority of severe injuries (n=85), followed by “ladders, unspecified” with 64 injuries and “movable ladders, unspecified” with 59 (Chart 50d). Due to the prevalence of falls in nonfatal injuries, it is not unexpected to see fall-related sources making up five of the top seven sources of severe injury. Notably, “heat—environmental” accounted for 51 severe injuries in 2023 as heat continues to be a hazard of concern within the industry (Phillips, 2024).

Chart 50d. Top 7 event/exposures and sources for severe injuries (2023)



Source: OSHA, 2015-2023 Severe Injury Reports.

TAKEAWAYS

On average, over 1,500 severe injuries annually occur in states under OSHA jurisdiction. These injuries have a higher likelihood of producing chronic injury and days away from work, as well as lasting mental and physical outcomes affecting return-to-work (Darter et al. 2018). In addition, chronic injuries are associated with prescription of pain medication, and the degradation of able-bodiedness resulting from pain medication can lead to declines in mental health.

OSHA Severe Injury reports allow us to characterize the circumstances surrounding these more serious workplace injuries which can guide prevention and intervention efforts, as well as monitor how they develop and change over time. Continually monitoring these injuries—particularly their impacts on workers—is also necessary because construction has the highest number of worker overdoses and the second highest suicide rate of any industry (Billock et al. 2023; Sussell et al. 2023).

RELATED CPWR PRODUCTS

- CPWR—The Center for Construction Research and Training. [n.d.]. Hazard-Specific Resources and Training Tools. www.cpwr.com/research/research-to-practice-r2p/r2p-library/other-resources-for-stakeholders/hazard-specific-resources/.
- CPWR—The Center for Construction Research and Training. [2025]. Severe Injury. [dashboard]. www.cpwr.com/research/data-center/construction-chart-book/interactive-7th/injuries-illnesses/.
 - This interactive data dashboard corresponds to the current chapter. It provides text and charts that can be filtered by year and major subsector.

DEFINITIONS

- **Major subsector** – 3-digit NAICS codes within construction. See Chapter 1 "Pulling and Classifying Data" for details.
- **Event/Exposure** – The manner in which the injury or illness was produced or inflicted, such as a fall, heat-related illness, etc. Based on the Occupational Injury and Illness Classification System (OIICS).
- **Severe injury** – An injury resulting in amputation of limb, loss of eye, or hospitalization.
- **Source** – The objects, substances, equipment, and other factors that were responsible for the injury or illness incurred by the worker, such as a ladder, cutting hand tools, etc. Based on the OIICS.
- **State OSHA office (State Plans)** – OSHA offices operated by individual states approved by federal OSHA.

DATA SOURCES AND NOTES

Occupational Safety and Health Administration (OSHA). (2025). Severe Injury Reports, 01/01/2015–04/30/2023. www.osha.gov/severeinjury.

- Only includes states that fall under federal OSHA jurisdiction, as other states operate under their own occupational safety and health programs which have different reporting systems.

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Sussell A, Peterson C, Li J, Miniño A, Scott KA, Stone DM. (2023). Suicide Rates by Industry and Occupation—National Vital Statistics System, United States, 2021. *MMWR Morb Mortal Wkly Rep* 72:1346–1350. www.cdc.gov/mmwr/volumes/72/wr/mm7250a2.htm.

Health Risk Factors in Construction

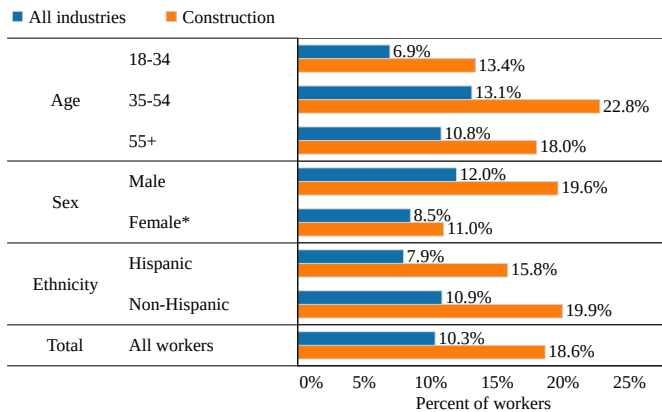
The prevalence of smoking, *obesity*, *hypertension*, and heavy drinking is a nationwide concern in the U.S. as these are risk factors for a variety of chronic diseases (e.g., *cardiovascular disease*, diabetes, cancer). Cardiovascular disease is the leading cause of death in the U.S., killing more people each year than all forms of cancer and accidental deaths combined (American Heart Association, 2025; Yasmin et al., 2025).

Construction workers have elevated rates of smoking, obesity, hypertension, and heavy drinking and are at a greater risk for various cardiovascular diseases than workers across all industries (CPWR, 2025). It is estimated that 1 in 25 construction workers are living with cardiovascular disease (American Heart Association, 2017). In addition, construction workers may be exposed to environmental hazards such as dust, chemicals, and fumes, which can increase the risks of cancer and cardiovascular disease, particularly when combined with other health risk factors (EPA, n.d.; Syamlal et al., 2018).

FINDINGS

Despite the declining rates of cigarette smoking in the U.S., workers in the construction industry have one of the highest rates of smoking (Strickland et al., 2017). In 2023, 18.6% of construction workers currently smoked, compared to 10.3% of workers in all industries (Chart 51a). Within construction, workers 35 to 54 years old had the highest percentage of current smokers (22.8%). There were also higher-than-average rates among non-Hispanic workers (19.9%) and male workers (19.6%).

Chart 51a. Percent of workers who are current smokers, by demographic and industry (2023)

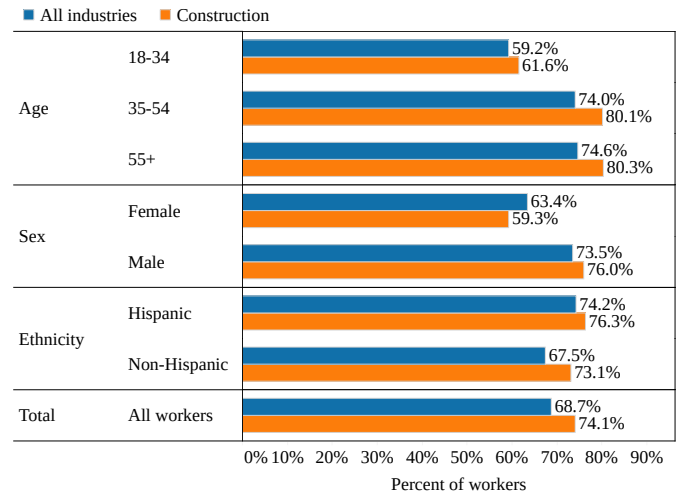


Source: IPUMS, 2023 National Health Interview Survey.

*Construction based on small sample size ($n < 30$). Interpret with caution.

Next, the percentage of workers who were *overweight* or obese was evaluated based on *body mass index* (BMI; Chart 51b). In 2023, nearly three-quarters (74.1%) of construction workers reported being overweight or obese, compared to 68.7% of workers across all industries. Construction workers 55 years and older (80.3%) and 35-54 years old (80.1%) had the highest percentages of being overweight or obese. The construction industry had higher rates than all industries across all demographic groups, except for female workers (59.3% versus 63.4%).

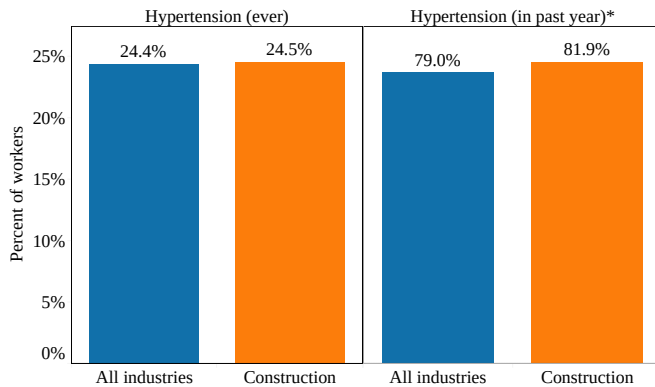
Chart 51b. Percent of workers who are overweight or obese, by demographic and industry (2023)



Source: IPUMS, 2023 National Health Interview Survey.

Rates of hypertension were also examined by industry. In 2023, nearly one in four construction workers (24.5%; Chart 51c) reported having hypertension at one point in their life, similar to that of all industries (24.4%). Of those diagnosed with hypertension, 81.9% of construction workers had in the past year compared to 79.0% among all industries.

Chart 51c. Percent of workers who have had hypertension, by industry (2023)

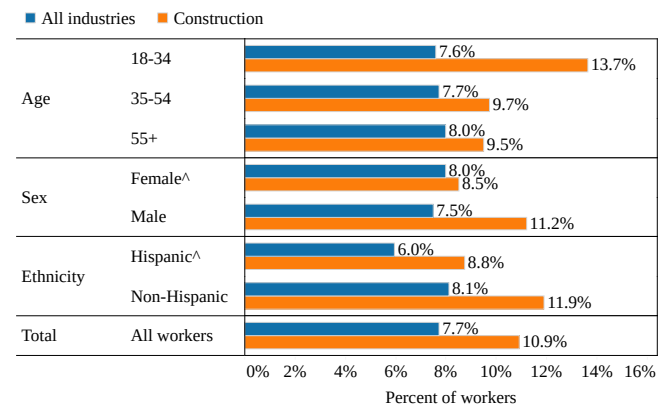


Source: IPUMS, 2023 National Health Interview Survey.

*Only includes respondents that reported having hypertension previously at one point in their lifetime.

Lastly, the percentage of workers who were heavy drinkers was assessed. Due to a lack of availability of data for construction in 2023, 2020 was chosen as the reference year. In 2020, 10.9% of construction workers were heavy drinkers, compared to 7.7% of workers in all industries (Chart 51d). Within construction, workers 18-34 years old (13.7%), non-Hispanic workers (11.9%), and male workers (11.2%) reported the highest percentages of heavy drinking.

Chart 51d. Percent of workers who are heavy drinkers, by demographic and industry (2020*)



Source: IPUMS, 2020 National Health Interview Survey.

*2020 is the most recent data available for construction.

^Construction based on small sample size (n<30). Interpret with caution.

TAKEAWAYS

Roughly one in five construction workers are current smokers and over 70% are overweight or obese. Across all demographics, construction had higher rates of current smokers and heavy drinkers than all industries. Meanwhile, nearly 1 in 4 workers have had hypertension at one point in their lifetime.

These risk factors can have consequences on the long-term health of construction workers through increasing their likelihood of developing a severe chronic illness or premature death. Therefore, rates of smoking, obesity, hypertension, heavy drinking, and other health risk factors among construction workers should be closely monitored.

RELATED CPWR PRODUCTS

- CPWR—The Center for Construction Research and Training. [2025]. Health Risk Factors. [dashboard]. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/injuries-illnesses-health/.
 - o This interactive data dashboard corresponds to the current chapter. It provides text and charts that can be filtered by year and health risk factor.

DEFINITIONS

- **Body mass index** – The measure of body fat on an individual based on height and weight (American Cancer Society, n.d.).
 - **Overweight** – A BMI of 25 to 29.9.
 - **Obese** – A BMI of 30 or above.
- **Cardiovascular disease** – Any disease of the heart and blood vessels such as heart disease, stroke, and heart attack (American Heart Association, n.d.).
- **Hypertension** – Occurs when the force of blood pushing against the blood vessel walls is too high with stage 1 hypertension characterized by having systolic pressure over 130 or diastolic pressure over 80 (American Heart Association, 2024).

DATA SOURCES AND NOTES

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Yasmin, F., Moeed, A., Ur Rahman, H. A., Ali Fahim, M. A., Salman, A., Shaharyar, M., Ochani, R. K., Shaik, A. A., Asghar, M. S., & Alraies, M. C. (2025). Trends and disparities in the prevalence of circulatory disease risk factors among U.S. adults from the National Health Interview Survey Database (2019–2022). *International Journal of Cardiology Cardiovascular Risk and Prevention*, 25, 200393. doi.org/10.1016/j.ijcrp.2025.200393.

Medical Expenditures

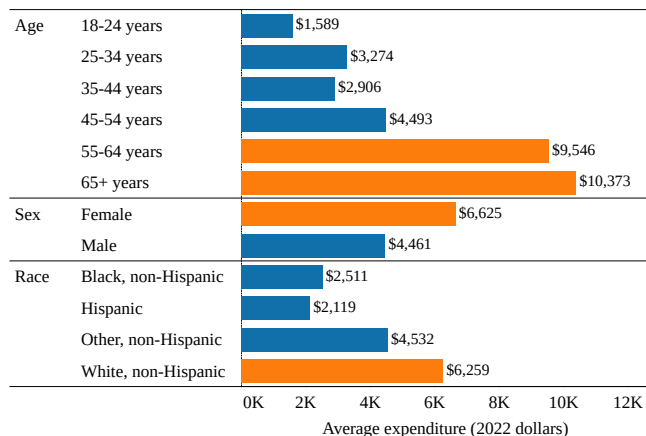
Healthcare is necessary for preventing and treating diseases and disabilities (HHS, n.d). Common barriers to this vital service are lack of health insurance and not having a primary care doctor.

This chapter examines medical *expenditures* among construction workers. This data provides information on healthcare use and insurance coverage, including how they change over time. Expenditure information can be used to identify potential gaps in care, as well as be used for resource allocation.

FINDINGS

From 2019 to 2022, the *average expenditure* on healthcare per person among construction workers was \$4,708 (data not shown). Average expenditure varied by demographics: by age, for example, the highest was among workers 65 years or older, with an average expenditure of \$10,373, followed by those 55-64 years old (\$9,546; Chart 52a). This is consistent with the overall population, where older individuals have higher healthcare spending (Mitchell, 2022). Females also had a higher expenditure than male workers, \$6,625 versus \$4,461. By race/ethnicity, white, non-Hispanic workers had the highest average expenditure per person (\$6,259), while Hispanic workers had the lowest (\$2,119). This finding is also consistent with the overall population, with whites overrepresented in highest spending category (Mitchell, 2022).

Chart 52a. Average medical expenditures among construction workers, by demographics (2019-2022; 2022 dollars)*

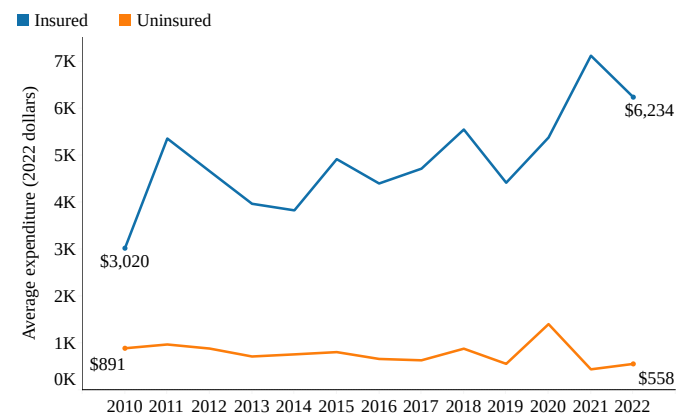


Source: Agency for Healthcare Research and Quality, 2019-2022 Medical Expenditure Panel Survey.

*Orange bars indicate average expenditure higher than all construction (\$4,708).

Next, average expenditures by *insurance status* were examined (Chart 52b). From 2011 to 2022, those with insurance had higher average expenditures than those without. Most recently (2022), the average expenditure was 11.2 times higher among those with insurance (\$6,234 versus \$558, respectively).

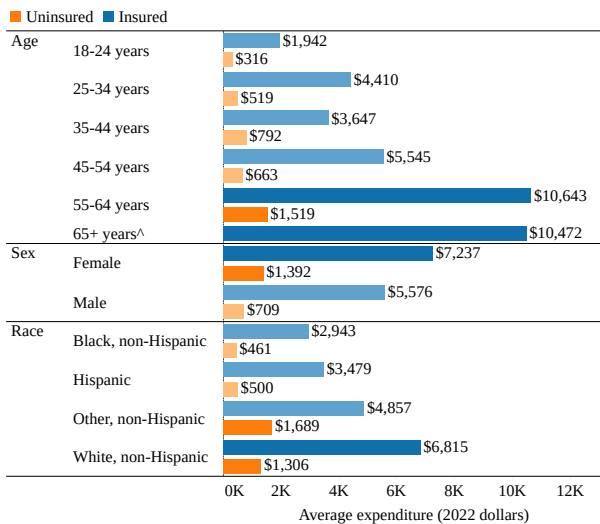
Chart 52b. Average medical expenditures among construction workers, by insurance status (2011-2022; 2022 dollars)



Source: Agency for Healthcare Research and Quality, 2011-2022 Medical Expenditure Panel Survey.

An analysis of average expenditures by insurance status and demographics found that three groups of construction workers—those 55 to 64 years old, females, and white non-Hispanics—had higher expenditures than the average among both insured and uninsured workers (Chart 52c). Other, non-Hispanic workers who were uninsured had a higher average expenditure than overall uninsured workers (\$1,689 versus \$747).

Chart 52c. Average medical expenditures among construction workers, by insurance status (2019-2022; 2022 dollars*)



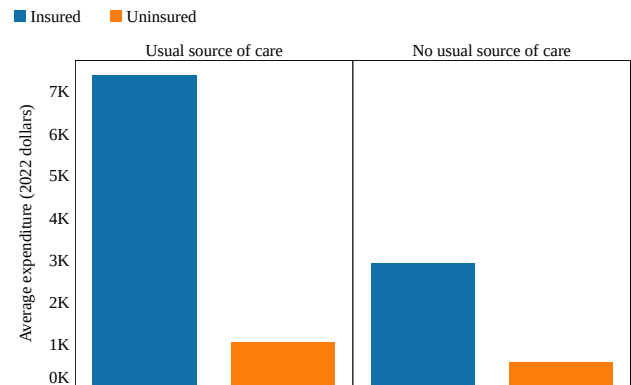
Source: Agency for Healthcare Research and Quality, 2019-2022 Medical Expenditure Panel Survey.

*Dark colors indicate average expenditure higher than all insured (\$5,793) or uninsured (\$747).

^Estimate for uninsured workers 65 years or older was excluded due to small sample size ($n < 10$).

Lastly, average expenditures by insurance status and *usual source of care* were explored. Insured workers' average expenditure was 6.9 times higher than uninsured workers with usual sources of care (\$7,367 versus \$1,063; Chart 52d). Among workers with no usual source of care, those with insurance had an average expenditure 4.9 times higher than those without insurance (\$2,917 versus \$595).

Chart 52d. Average medical expenditures among construction workers, by insurance status and usual care (2019-2022; 2022 dollars)



Source: Agency for Healthcare Research and Quality, 2019-2022 Medical Expenditure Panel Survey.

TAKEAWAYS

Construction workers who were insured, 55 to 64 years old, female, and white non-Hispanic, as well as those with a usual source of care, had higher medical expenditures than all construction workers, indicating that others in related demographic categories may be suffering from a gap in healthcare services. These figures highlight a need for further examination of health insurance coverage (see Chapter 26) and medical care among construction workers to ensure they have access to healthcare that can prevent and treat diseases and disabilities.

RELATED CPWR PRODUCTS

- CPWR—The Center for Construction Research and Training. [2025]. Health Insurance Coverage. [dashboard]. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/employment-income/.
- CPWR—The Center for Construction Research and Training. [2025]. Healthcare Expenditures in Construction. [dashboard]. www.cpwr.com/research/data-center/the-construction-chart-book/interactive-7th/injuries-illnesses-health/.
 - o This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by year.

DEFINITIONS

- **Expenditures** – Direct payments by individuals, public and private insurance, Worker’s Compensation, and other public sources for hospital stays, emergency room visits, outpatient department visits, office-based medical provider visits, dental visits, home health care, other medical expenses, and prescription medicines.
 - **Average expenditure** – The average expenditure per construction worker.
- **Insurance status** – Having any private or public insurance at any time over the past year is insured, and no insurance during the past year is uninsured.
- **Usual source of care** – Medical care provider or other place where people usually go when sick or in need of advice about health.

DATA SOURCES AND NOTES

Agency for Healthcare Research and Quality. (2025). 2019-2022 Medical Expenditure Panel Survey. meps.ahrq.gov.

- Construction workers include individuals who reported working in the construction industry 18 years or older.
- Expenditures were adjusted for inflation to 2022 Gross Domestic Product (GDP) to provide a better comparison over time.
- Individuals with expenditures greater than \$100,000 and above the 99th percentile were removed as outliers.

REFERENCES

Mitchell, E.M. (2022). STATISTICAL BRIEF #540: Concentration of Healthcare Expenditures and Selected Characteristics of Persons with High Expenses, U.S. Civilian Noninstitutionalized Population, 2019. meps.ahrq.gov/data_files/publications/st540/stat540.shtml.

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OSHA Inspections and Citations

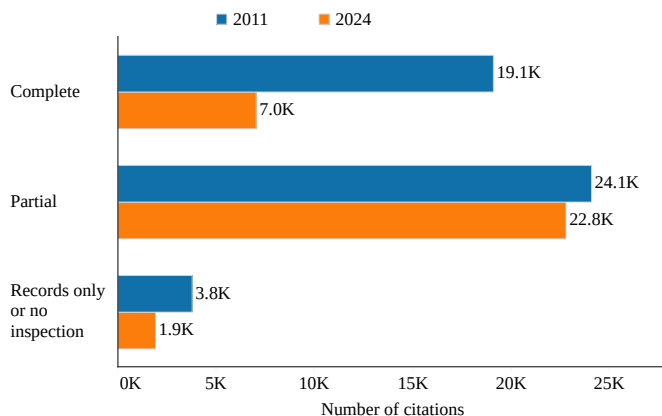
Established in 1970, the Occupational Safety and Health Administration (OSHA) oversees the enforcement of workplace safety and health regulations in the U.S. (Balser, 2024). OSHA works to reduce hazards, injuries, and illnesses at over 7 million sites, including the employment of inspectors, also called compliance officers, whose goal is to assure compliance with safety and health requirements (OSHA, n.d.).

OSHA inspections involve multiple steps, including an opening conference between site representatives and the inspector, a walkthrough evaluation of the site, and a closing conference (NAHB, n.d.). After the inspection, the compliance officer may issue citations if violations are detected; these can carry a significant penalty amount if the violation is severe (Yaniz, 2021). Construction is one of the leading industries for receiving inspections from both *federal* and *state* OSHA offices, and construction workplaces are frequently cited for safety and health violations, which often cost the industry upwards of \$100 million in penalties a year (adjusted to 2018 dollars; Brown et al., 2021). This chapter explores inspections, citations, and penalties issued by OSHA to the construction industry.

FINDINGS

From 2011 to 2024, the total number of OSHA inspections in construction declined 32.6% (47 thousand (K) to 31.7K, data not shown). Complete inspections declined by more than half (63.4%; 19.1K to 7K), while *partial inspections* experienced a 5.4% reduction (24.1K to 22.8K). *Records only/no physical inspections* declined by 50% (3.8K to 1.9K; Chart 53a).

Chart 53a. Number of inspections, by inspection scope, (2011 versus 2024)*

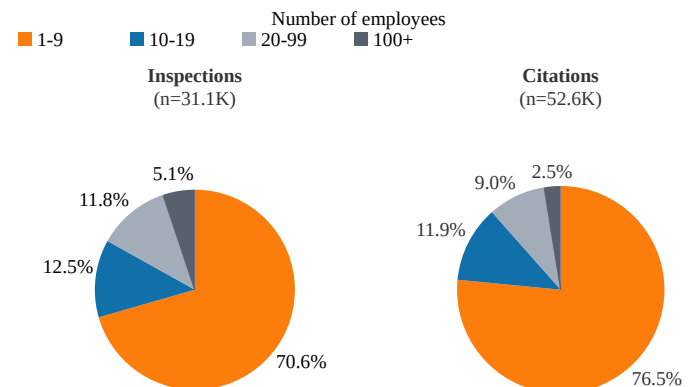


Source: U.S. Department of Labor, 2011-2024 OSHA Enforcement Data.

*Data downloaded January 2025 due to being close to end of 2024 and may change.

Next, the share of inspections and citations by *establishment size* were evaluated. In 2024, establishments with fewer than 10 employees received over half of all inspections (70.6%, Chart 53b) and more than three-quarters of the total number of citations (76.5%). Very large establishments, those with more than 100 employees, received the smallest share of both inspections (5.1%) and citations (2.5%).

Chart 53b. Percent of inspections and citations by establishment size (2024)*

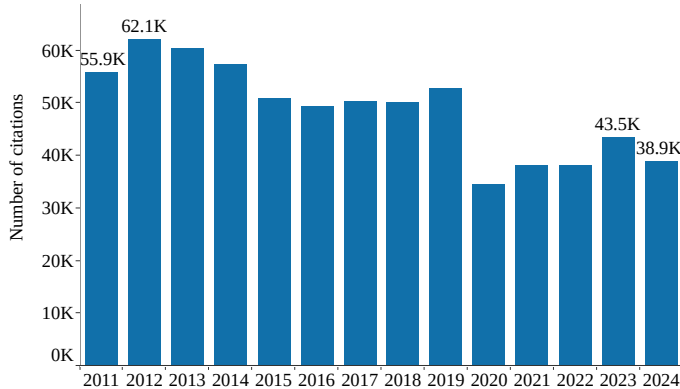


Source: U.S. Department of Labor, 2011-2024 OSHA Enforcement Data.

*Data downloaded January 2025 due to being close to end of 2024 and may change.

The total number of citations stemming from *serious, willful, or repeat* violations were then examined. The number of citations in these categories declined 30.4% from 2011 to 2024 (55.9K to 38.9K, Chart 53c). During the COVID-19 pandemic, citations decreased sharply, with 2023 recording the highest total (43.5K) since the start of the pandemic. Despite this increase, the number of serious, willful, or repeat violations are still below pre-pandemic levels.

Chart 53c. Serious, willful, repeat citations (2011-2024)*

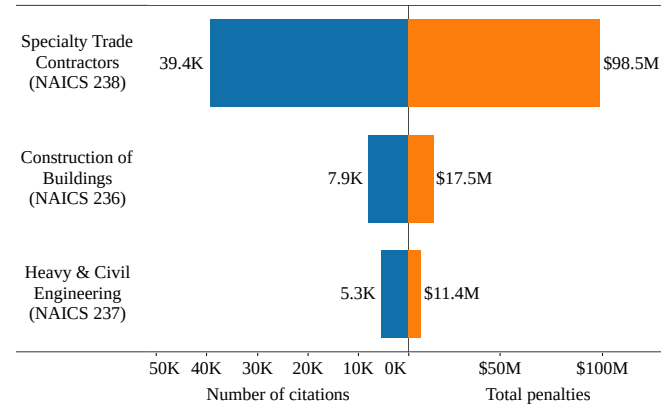


Source: U.S. Department of Labor; 2011-2024 OSHA Enforcement Data.

*Data downloaded January 2025 due to being close to end of 2024 and may change.

In 2024, Specialty Trade Contractors (NAICS 238) led all major subsectors in number of citations and associated penalties. They received 39.4K citations, which was three times larger than the citations received in the other two major subsectors combined (13.2K, Chart 53d). Specialty Trade Contractors also had \$98.5 million in penalties, 3.4 times the amount of the other two major subsectors combined (\$28.9M).

Chart 53d. Total citations and penalties, by major subsector (2024)*



Source: U.S. Department of Labor; 2011-2024 OSHA Enforcement Data.

*Data downloaded January 2025 due to being close to end of 2024 and may change.

TAKEAWAYS

While the number of fatal injuries in construction is higher than in 2011 (Harris et al., 2024), OSHA inspections and citations in the industry have declined. In 2019, the number of safety and health inspectors was cut to its lowest number in 40 years (Berkowitz, 2019). Additionally, OSHA reduced the number of physical inspections during the pandemic to limit person-to-person contact (OIG, 2021). As a result, both complete and partial inspections fell from 2011 to 2024 (as shown above).

Serious, willful, and repeat violations remain a major issue in construction, resulting in thousands of citations and costing the industry millions in penalties annually. As construction continues to be one of the most dangerous, continual monitoring of OSHA inspections and citations remains a vital part of construction safety and health research.

RELATED CPWR PRODUCTS

- CPWR—The Center for Construction Research and Training. [2025]. OSHA Inspections and Citations. [dashboard]. cpwr.com/research/data-center/construction-chart-book/interactive-7th/other-topics/.
 - o This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by activity and year.

DEFINITIONS

- **Establishment size** – The number of employees working for an establishment during a calendar year.
- **Federal OSHA office** – OSHA offices operated by the federal government.
- **Partial inspection** – An inspection focusing on specific potentially hazardous areas, operations, conditions, or practices at the establishment, as opposed to a full inspection of the worksite.
- **Records only/no physical inspections** – OSHA inspections that included a review of establishment records but no physical inspection.
- **Serious, willful, or repeat** – A serious violation is issued for a hazard in a workplace with a high probability of causing death or serious physical harm and that employers knew or should have known about. A willful violation is issued when an employer knowingly does not abide by OSHA standards and makes no effort to rectify the situation. A repeated violation is when employers are repeatedly cited for the same OSHA violation.
- **State OSHA office (State Plans)** – OSHA offices operated by individual states approved by federal OSHA.

DATA SOURCES AND NOTES

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OSHA Citations for Chemical Exposures: Asbestos, Lead, and Silica

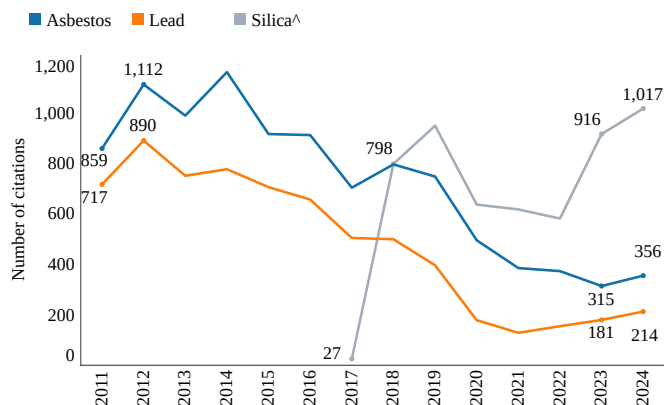
The construction industry is one of the most dangerous, with its workers facing exposure to a variety of physical and chemical hazards (CPWR, 2025; Gislason, 2024). For example, construction workers' average exposure score to contaminants was 1.7 times higher than workers in all industries (see Chapter 33: O*NET Reported Occupational Exposures and Hazards in Construction).

The Occupational Safety and Health Administration (OSHA) oversees the enforcement of workplace safety and health requirements in the U.S. through worksite inspections and issuing citations for violation of standards, including chemical exposures. This chapter examines citations OSHA issued for violations of the standards related to asbestos, lead, or silica. Chapter 53 examines overall inspection and citations.

FINDINGS

From 2011 to 2024, the number of citations for *lead-related violations* decreased 70.1% (717 to 214), while *asbestos-related violations* declined 58.6% (859 to 356; Chart 54a). The decline for lead violations follows a 43.0% decrease in the prevalence rate of *elevated blood lead level (BLL)* among employed adults 16 years and older, as reported in the Centers for Disease Control and Prevention's Adult Blood Lead Epidemiology and Surveillance data from 2011 to 2022 (20.7 to 11.8 per 100,000 employed adults; CDC, 2024). Exposures to asbestos have also been decreasing as its use has declined, but they can still occur, especially when work is done on older buildings (American Cancer Society, n.d.). From 2017 to 2024, however, the number of citations for *silica-related violations* increased 27.4% (798 to 1,017). Data for silica not available before 2017 as the OSHA's final rule on exposure to respirable crystalline silica was not published until March 2016. The timing of the standard may also explain the increase in 2018.

Chart 54a. Number of citations, by exposure (2011-2024)*



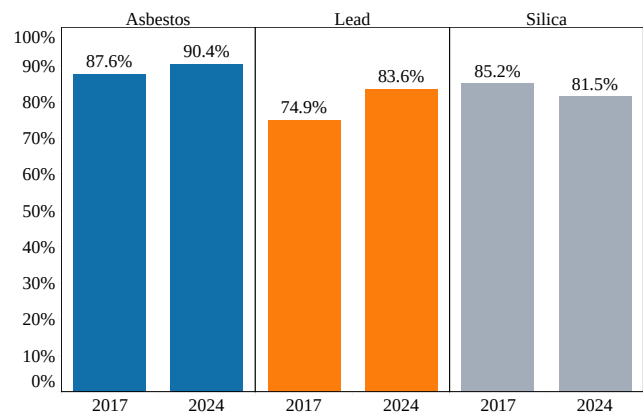
Source: U.S. Department of Labor, 2011-2024 OSHA Enforcement Data.

*Data downloaded January 2025 due to being close to end of 2024 it may change.

^Silica data not available until 2017 as standard published March 2016.

Next, the percentage of citations that were *serious, willful, or repeat* for each exposure were examined (Chart 54b). From 2017 to 2024, the percentage of citations that were serious, willful, or repeat increased for asbestos (87.6% to 90.4%) and lead (74.9% to 83.6%), while there was a decline in the percentage of serious, willful, or repeated silica-related citations (85.2% to 81.5%).

Chart 54b. Serious, willful, or repeat citations, by exposure (2017 versus 2024)*

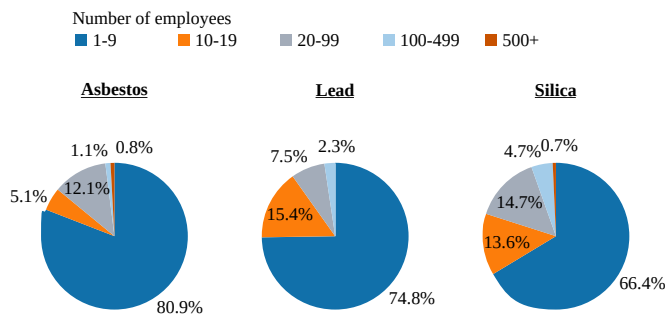


Source: U.S. Department of Labor, 2011-2024 OSHA Enforcement Data.

*Data downloaded January 2025 due to being close to end of 2024 it may change.

Citations for each exposure type were then examined by *establishment size* (Chart 54c). A majority (of the citations issued for all exposures went to small establishments, those with fewer than 10 employees. Prior studies have found that small employers are less likely to have occupational safety and health resources, such as safety training (Flynn et al., 2015).

Chart 54c. Citations, by exposure and establishment size (2024)*

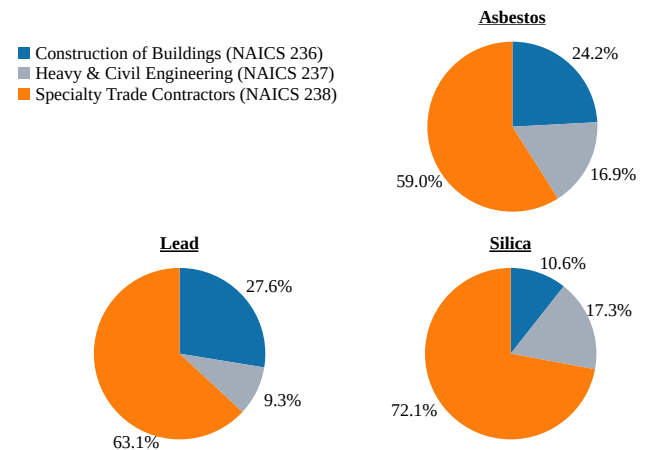


Source: U.S. Department of Labor, 2011-2024 OSHA Enforcement Data.

*Data downloaded January 2025 due to being close to end of 2024 it may change.

Lastly, citations were examined by *major subsector* (Chart 54d). Specialty Trade Contractors (NAICS 238) received a majority of the citations issued for each exposure. Approximately a quarter of citations for asbestos-related and lead-related violations went to Construction of Buildings (NAICS 236).

Chart 54d. Citations, by exposure and major subsector (2024)*



Source: U.S. Department of Labor, 2011-2024 OSHA Enforcement Data.

*Data downloaded January 2025 due to being close to end of 2024 it may change.

TAKEAWAYS

With construction continuing to be one of the most hazardous work environments, monitoring citations for chemical exposures provides insights into trends for the potential risks workers encounter. While there have been decreases in lead and asbestos-related citations in recent years, silica violations have increased.

Citations also can be used to guide safety and health interventions: for example identification of those subsectors with increased citations (including small establishments) may allow for focused implementation of workplace safety and health interventions.

RELATED CPWR PRODUCTS

- CPWR—The Center for Construction Research and Training. [2025]. OSHA Citations for Chemical Exposures. [dashboard]. cpwr.com/research/data-center/construction-chart-book/interactive-7th/other-topics/.
 - This interactive data dashboard corresponds to the current chapter. It provides charts and text that can be filtered by exposure and year.
- CPWR—The Center for Construction Research and Training. [2025]. OSHA Inspections and Citations in Construction. [dashboard]. cpwr.com/research/data-center/construction-chart-book/interactive-7th/other-topics/.

DEFINITIONS

- **Elevated blood lead level (BLL)** – A lead level greater than 10 micrograms per deciliter (µg/dL) of blood.
- **Establishment size** – The number of employees working for an establishment during a calendar year.
- **Citation** – Violation of a standard for one of the following substances resulting from an inspection in the construction industry:
 - **Asbestos-related violation** – Citation resulting from violation of CFR 1910.1001 or CFR 1926.1101.
 - **Lead-related violation** – Citation resulting from violation of CFR 1910.1025 or CFR 1926.62.
 - **Silica-related violation** – Citation resulting from violation of CFR 1910.1053 or CFR 1926.1153.
- **Major subsector** – 3-digit NAICS codes within construction. See Chapter 1 “Pulling and Classifying Data” for details.
- **Serious, willful, or repeat** – A serious violation is issued for a hazard in a workplace with a high probability of causing death or serious physical harm and that employers knew or should have known about. A willful violation is issued when an employer knowingly does not abide by OSHA standards and makes no effort to rectify the situation. A repeated violation is when employers are repeatedly cited for the same OSHA violation.

DATA SOURCES AND NOTES

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- Silica data are unavailable before 2017, as the standards were not published until March 25, 2016.

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