



THE CENTER FOR CONSTRUCTION  
RESEARCH AND TRAINING

# THE CONSTRUCTION CHART BOOK: THE U.S. CONSTRUCTION INDUSTRY AND ITS WORKERS

**CPWR Data Center:**

**Sue Dong, DrPH**

**Wen Wang, PhD**

**Rebecca Katz, MPH**

June 27, 2018



**CPWR Webinar  
Series**

# The Construction Chart Book

- Introduction
- New Findings
- New Features
  - Hands-on Examples
- Data Sources

# The Construction Chart Book

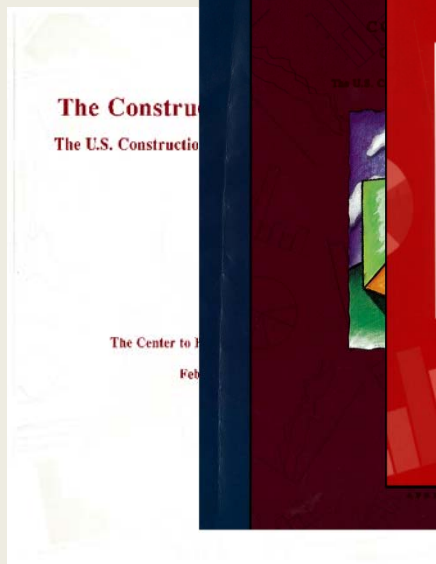
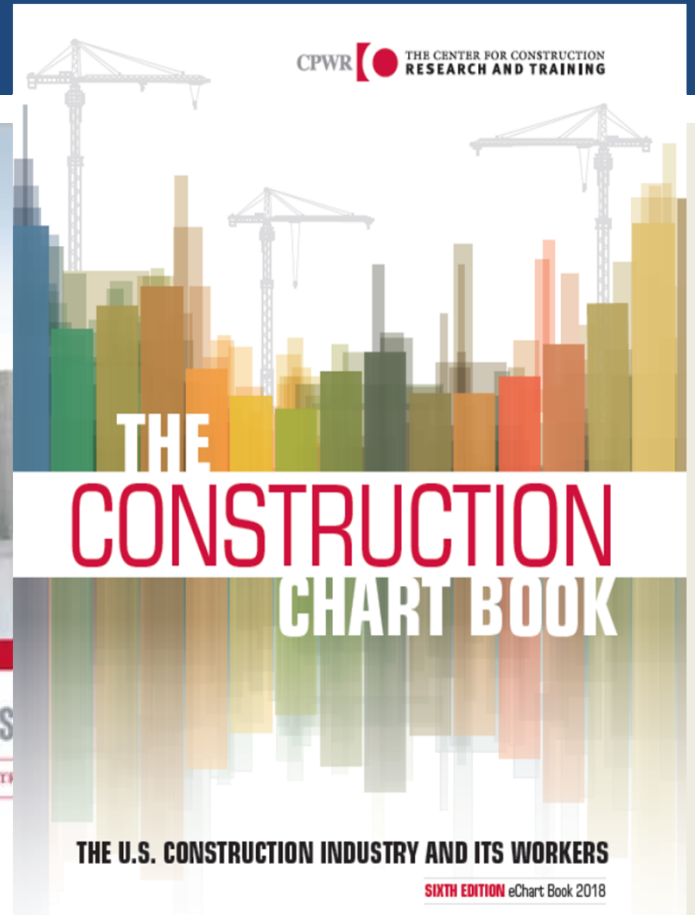
**1. Introduction**

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# The Construction Chart Book: 1<sup>st</sup> - 6<sup>th</sup> editions



# Acknowledgements

This book is a product of CPWR's Data Center: Xiuwen (Sue) Dong, DrPH, principal author; and Xuanwen Wang, PhD, and Rebecca Katz, MPH, co-authors. Gavin West, MPH, CPWR, and Bruce Lippy, PhD, CPWR, were contributing authors. Christina Trahan Cain, CIH, CPWR Executive Director, and Rosemary Sokas, MD, MOH, CPWR Interim Deputy Director, served as internal reviewers and provided input and support for this edition, along with other CPWR staff. Eileen Betit, CPWR Research to Practice Director, Sharretta Benjamin, CPWR Communications Coordinator, and Clayton Sinyai, PhD, CPWR Communications Research Manager, coordinated publication and dissemination.

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Publication layout was performed by Sharretta Benjamin, CPWR. Proof reading by Sarah Wood. Cover design by Carlton Creative.

# Impact



- Google search:14,400 results
- Google Scholar: 630; "construction chartbook" returns another 44
- Google Books: 1,720; 36 for "construction chartbook"
- About 5,000 page views and 2,425 downloads between March 8-31, 2018 through [www.cpwr.com](http://www.cpwr.com)

# Selected Chart Book Users

- [American Industrial Hygiene Association](#)
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# Comments from the National Academy

“As part of its work, the center produces *The Construction Chart Book*, which presents **extensive analysis** of data on construction safety and health and other facets of the U.S. construction industry with **creative use** of publicly available information including economic, demographic, employment and income, and education and training data.”

“... **widely used by industry stakeholders.**”

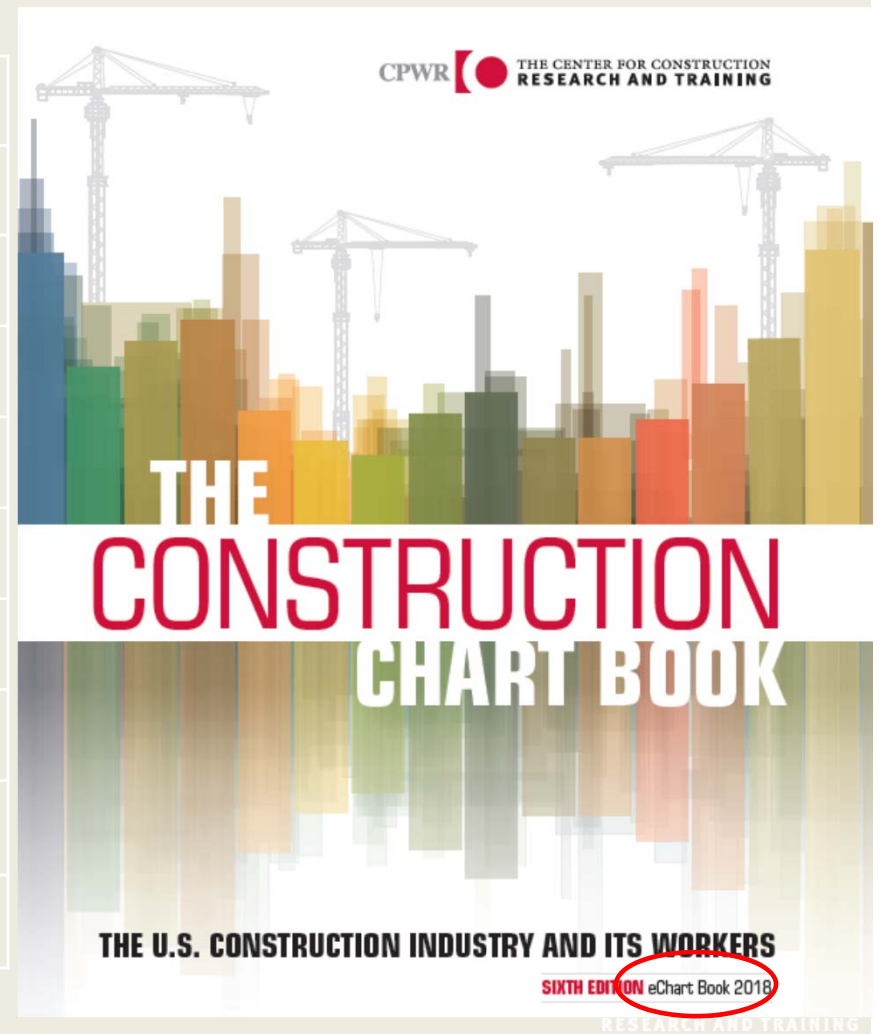
(*National Academies of Sciences, Engineering, and Medicine. 2018. A Smarter National Surveillance System for Occupational Safety and Health in the 21st Century. Washington, DC: The National Academies Press. <https://doi.org/10.17226/24835> )*



# The Construction Chart Book Sixth Edition

<https://www.cpwr.com/publications/construction-chart-book>

Section	Contents
1	Industry Summary
2	Labor Force Characteristics
3	Employment and Income
4	Education and Training
5	Hazards and Exposures
6	Fatal and Nonfatal Injuries
7	Occupational Diseases
8	OSHA Enforcement and Injury Costs
9	Health Indicators and Services



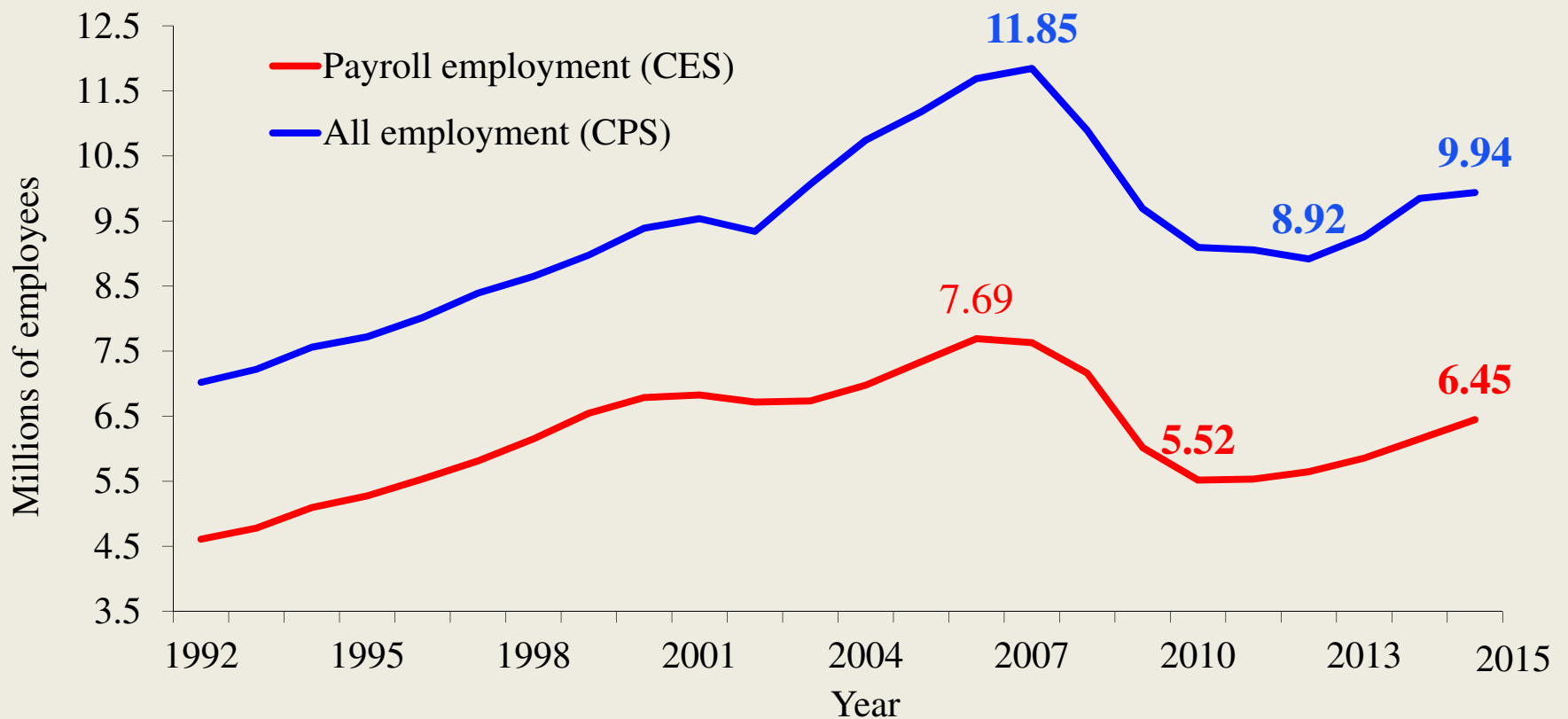
# The Construction Chart Book



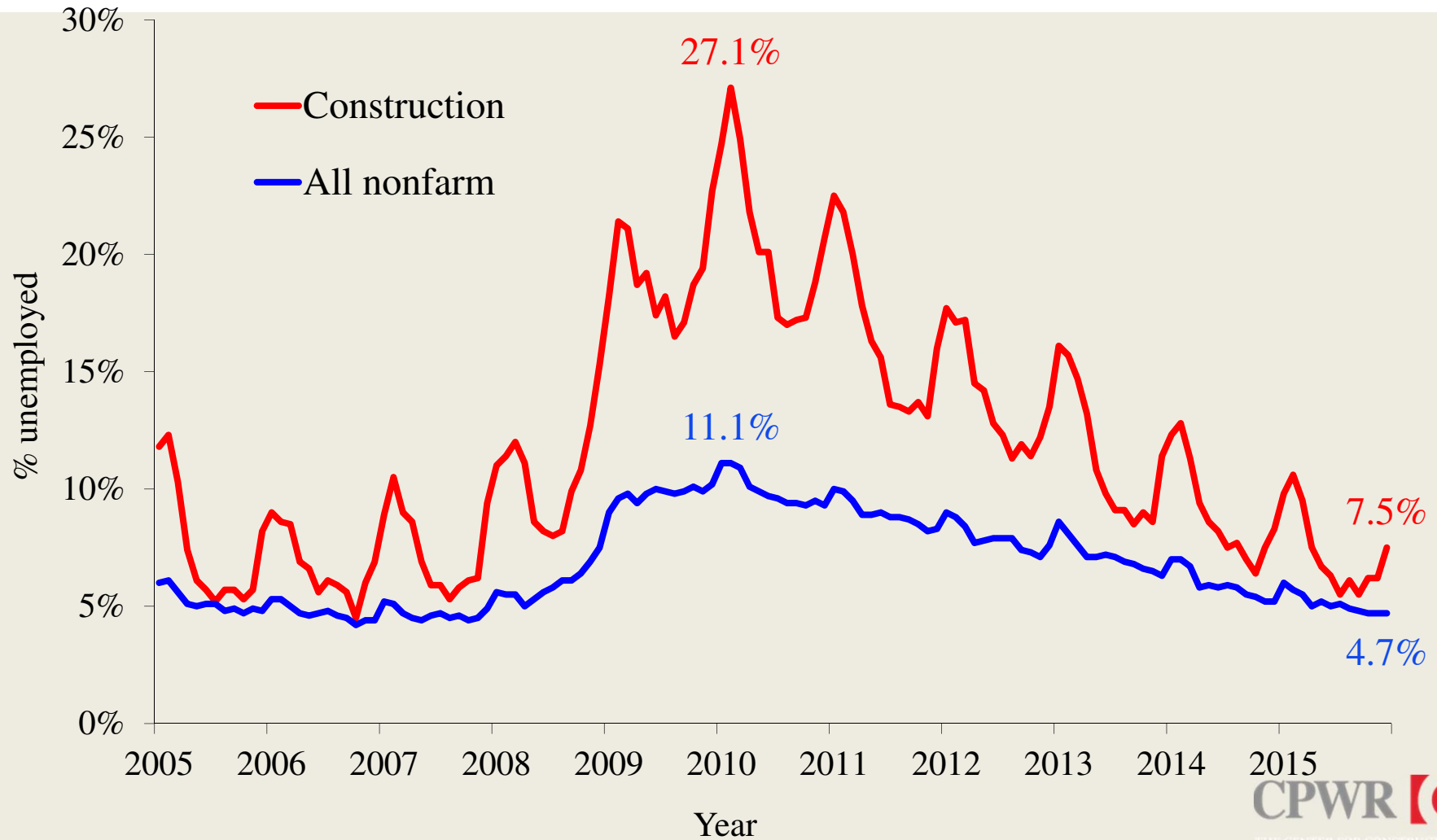
**2a. Number and percentage of construction establishments and employees, by establishment size, 2012  
(With payroll)**

<b>Establishment size (number of employees)</b>	<b>Number of establishments</b>	<b>% of all establishments</b>	<b>Number of employees</b>	<b>% of all employees</b>
1 to 9	484,866	81.1%	1,409,984	24.9%
10 to 19	58,731	9.8%	805,819	14.2%
20 to 99	48,151	8.1%	1,868,325	33.0%
100 to 499	5,866	1.0%	1,069,382	18.9%
500 or more	452	0.1%	516,112	9.1%
<b>Total</b>	<b>598,065</b>	<b>100.0%</b>	<b>5,669,623</b>	<b>100.0%</b>

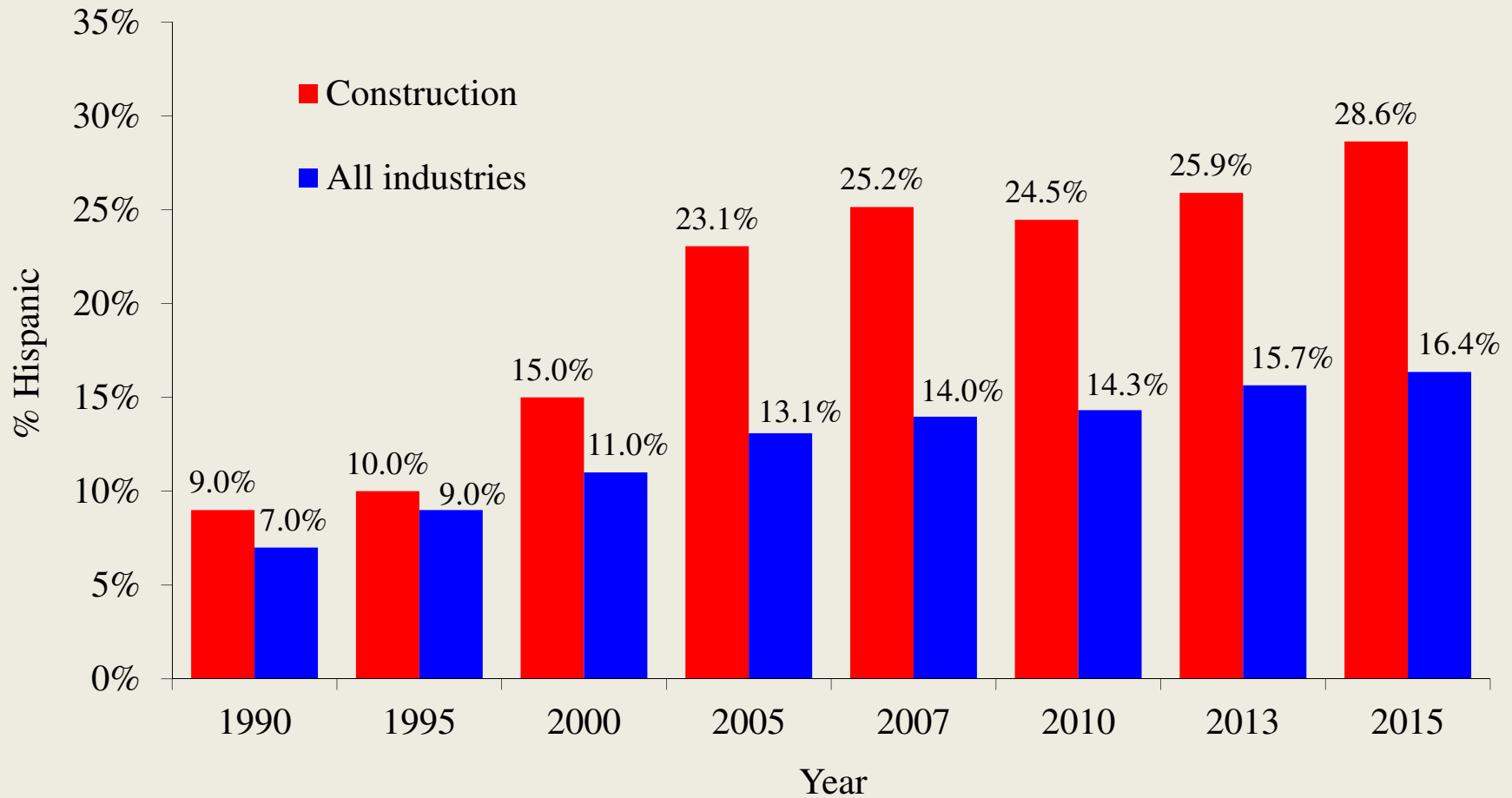
## 20a. Construction employment, payroll employment versus all employment, 1992-2015



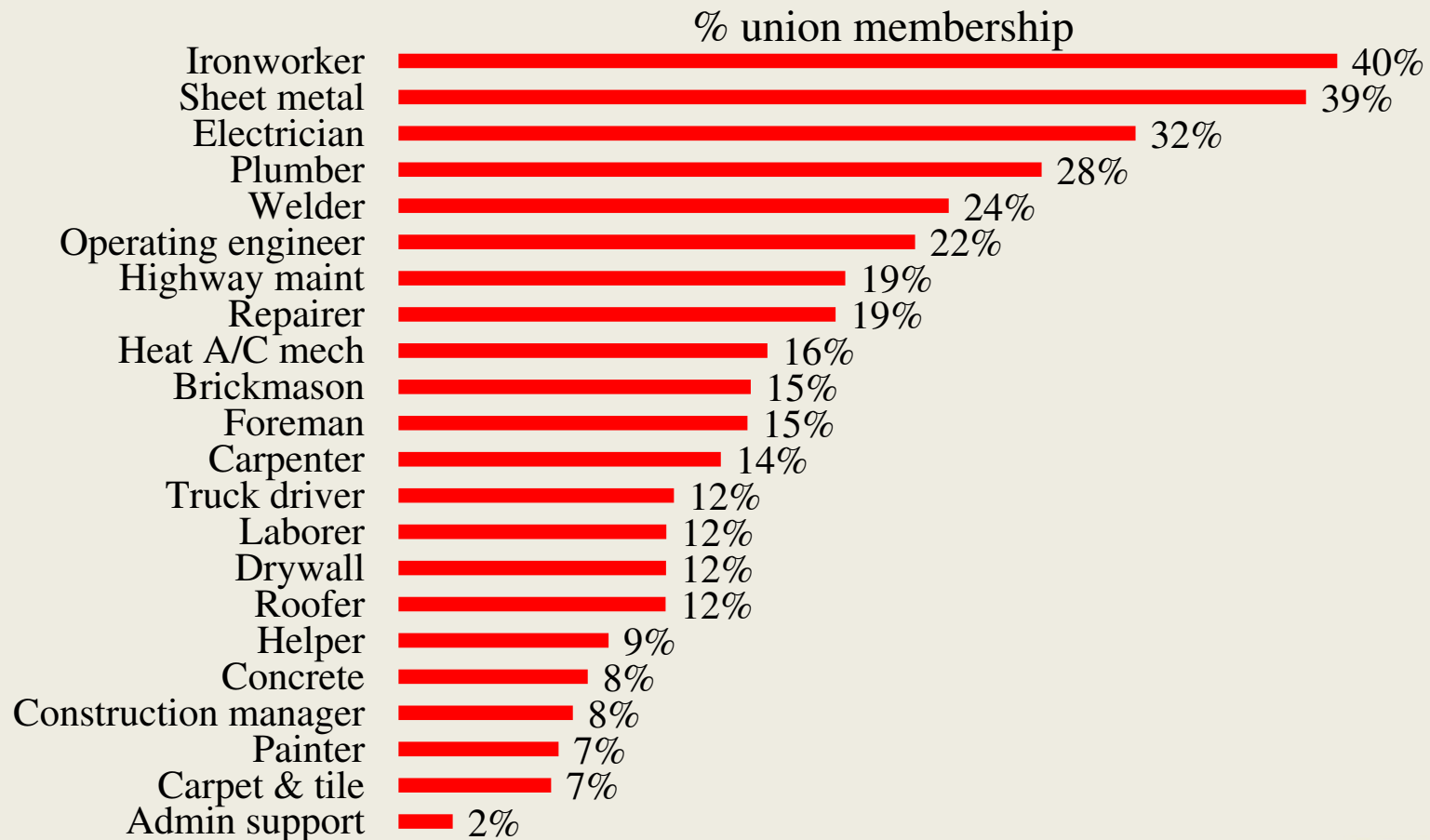
**20f. Monthly unemployment rate, construction versus all nonfarm industries, 2005-2015**  
(Not seasonally adjusted; private wage-and-salary workers)



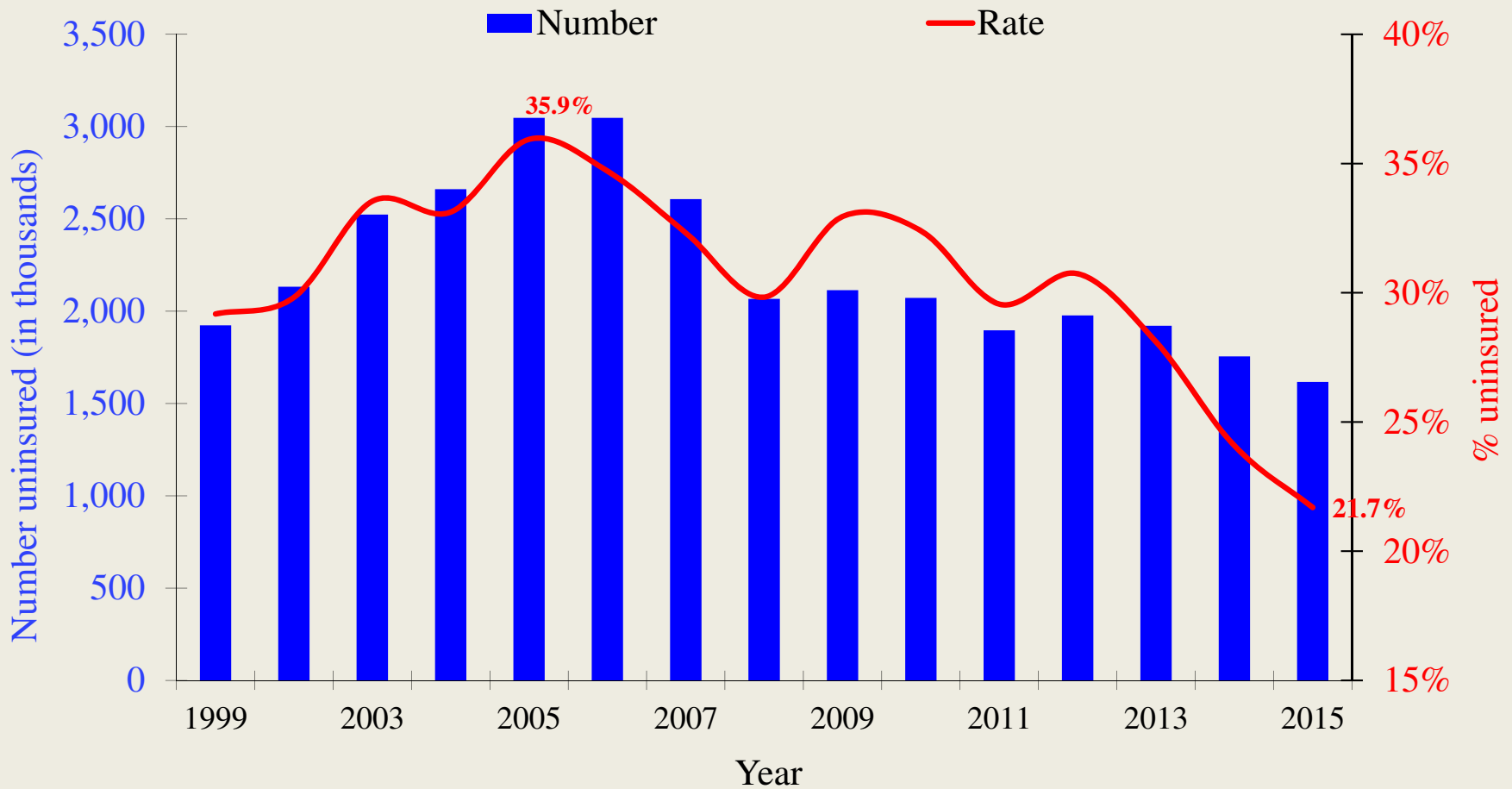
## 16a. Hispanic workers as a percentage of the workforce, construction versus all industries, selected years, 1990-2015 (All employment)



## 12c. Union membership, selected construction occupations, 2015 (Wage-and-salary workers)

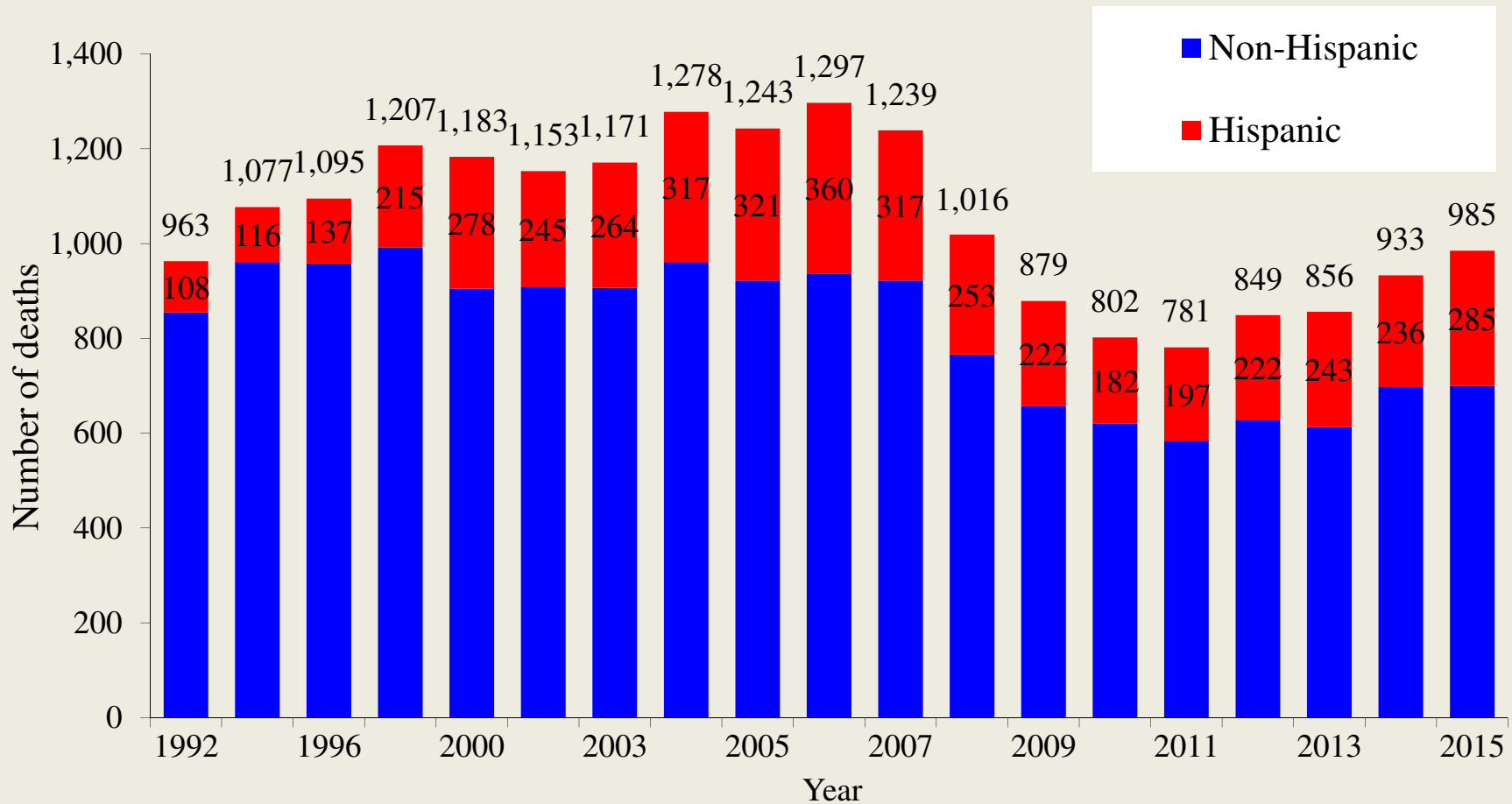


## 26b. Number and rate of uninsured construction workers, selected years, 1999-2015

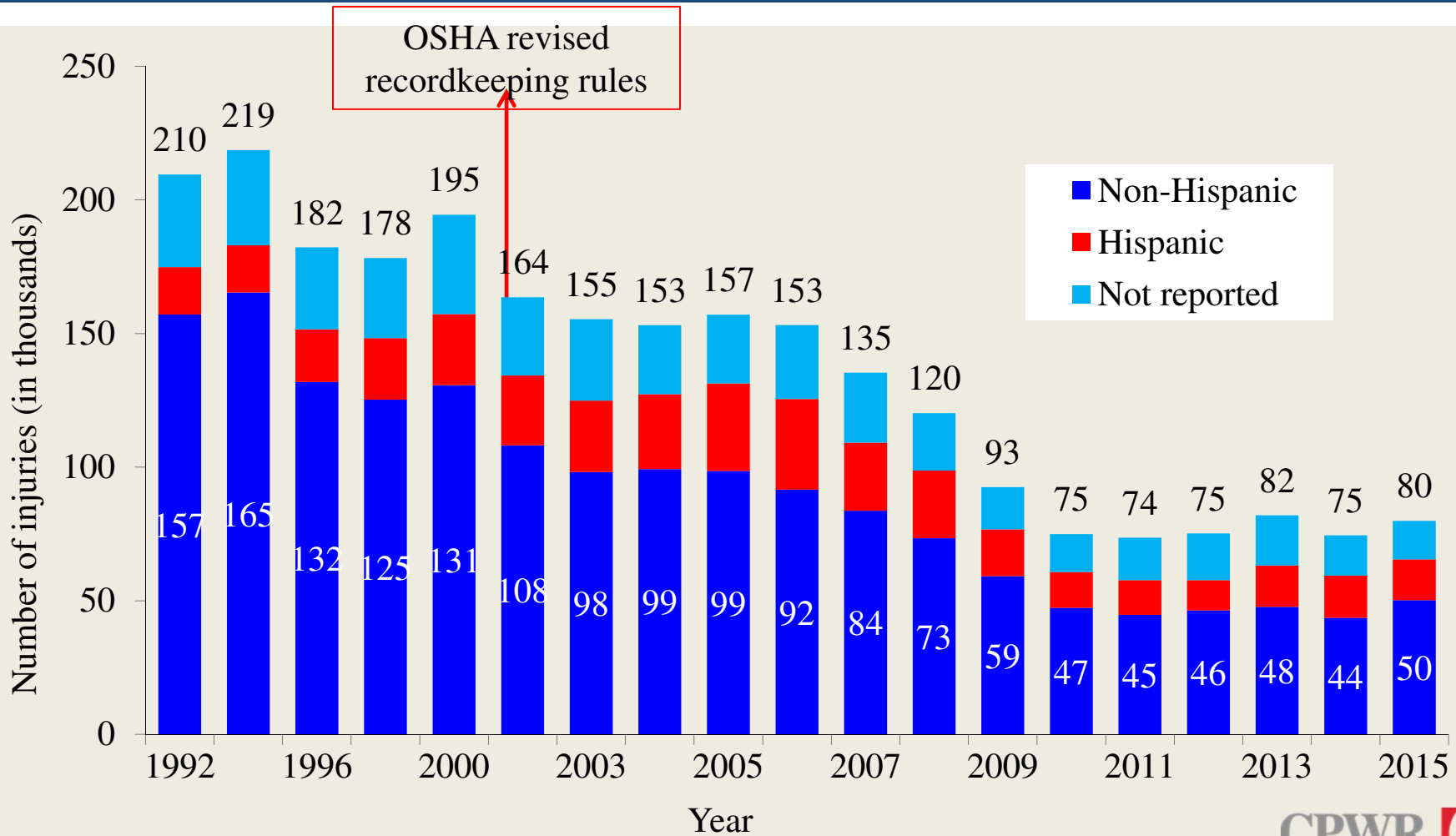




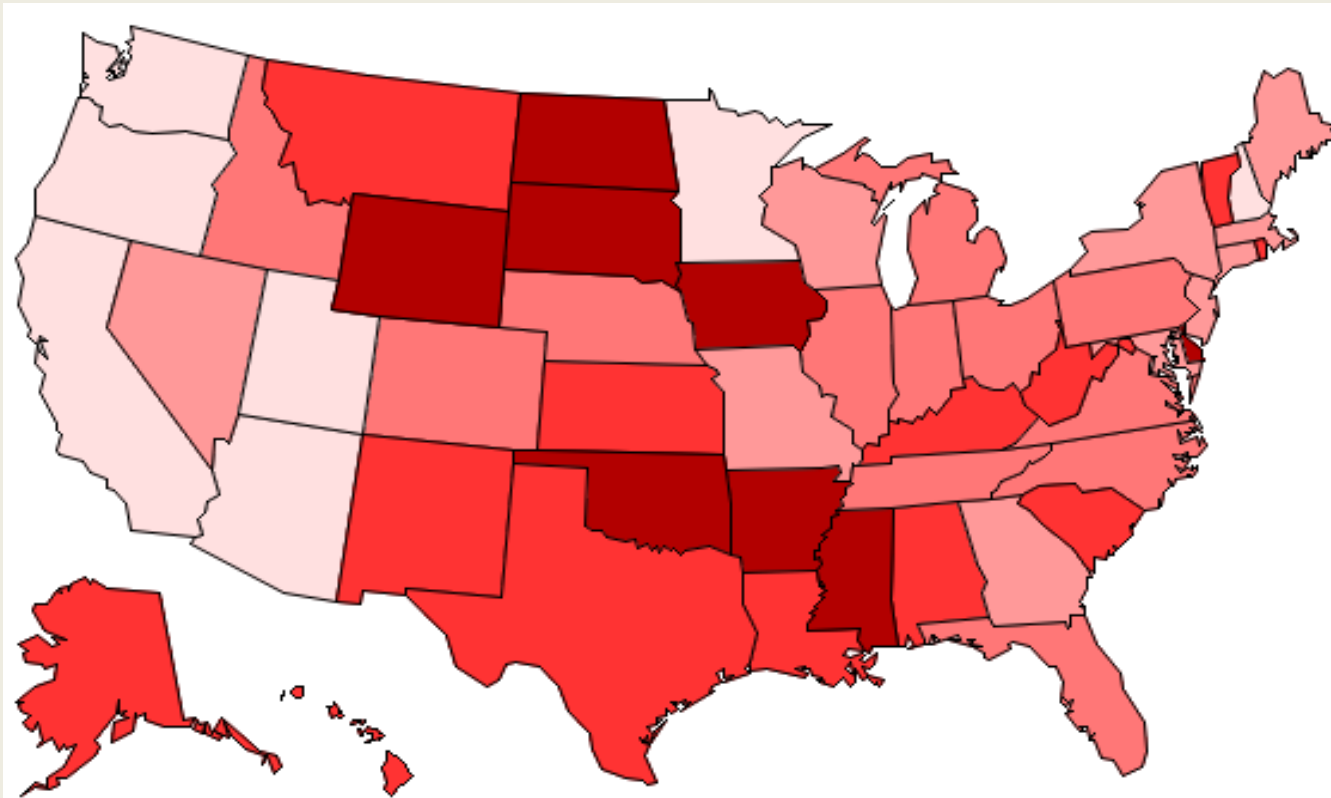
## 38b. Number of fatalities in construction, selected years between 1992 and 2015 (All employment)



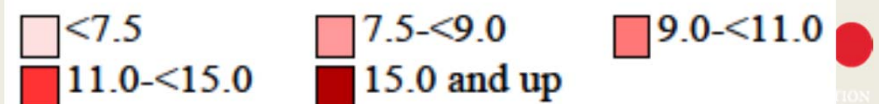
## 38d. Number of nonfatal injuries resulting in days away from work in construction, selected years between 1992 and 2015



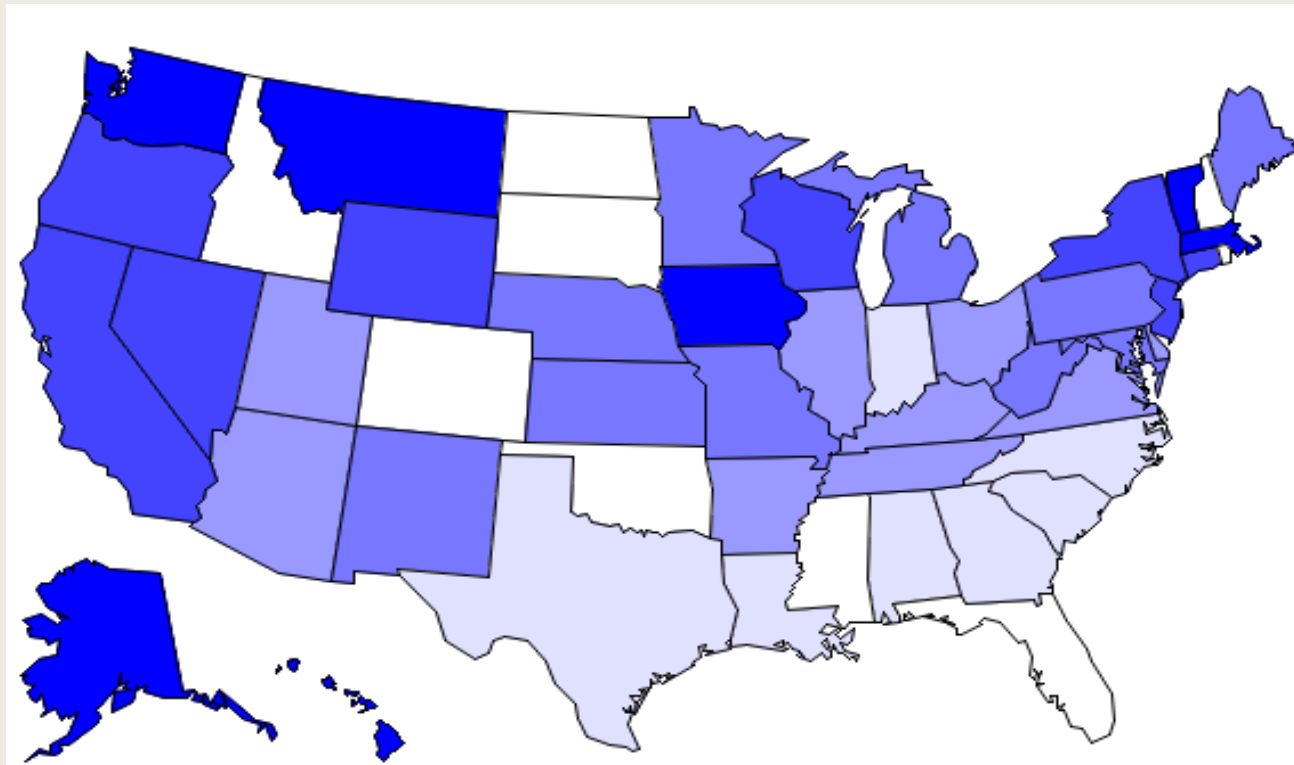
**40d. Rate of fatalities in construction, by state, 2011-2015 average  
average  
(All employment)**



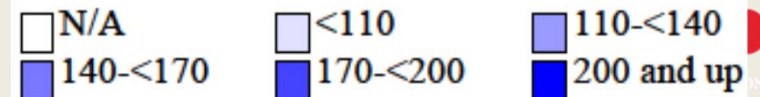
Deaths per 100,000 FTEs



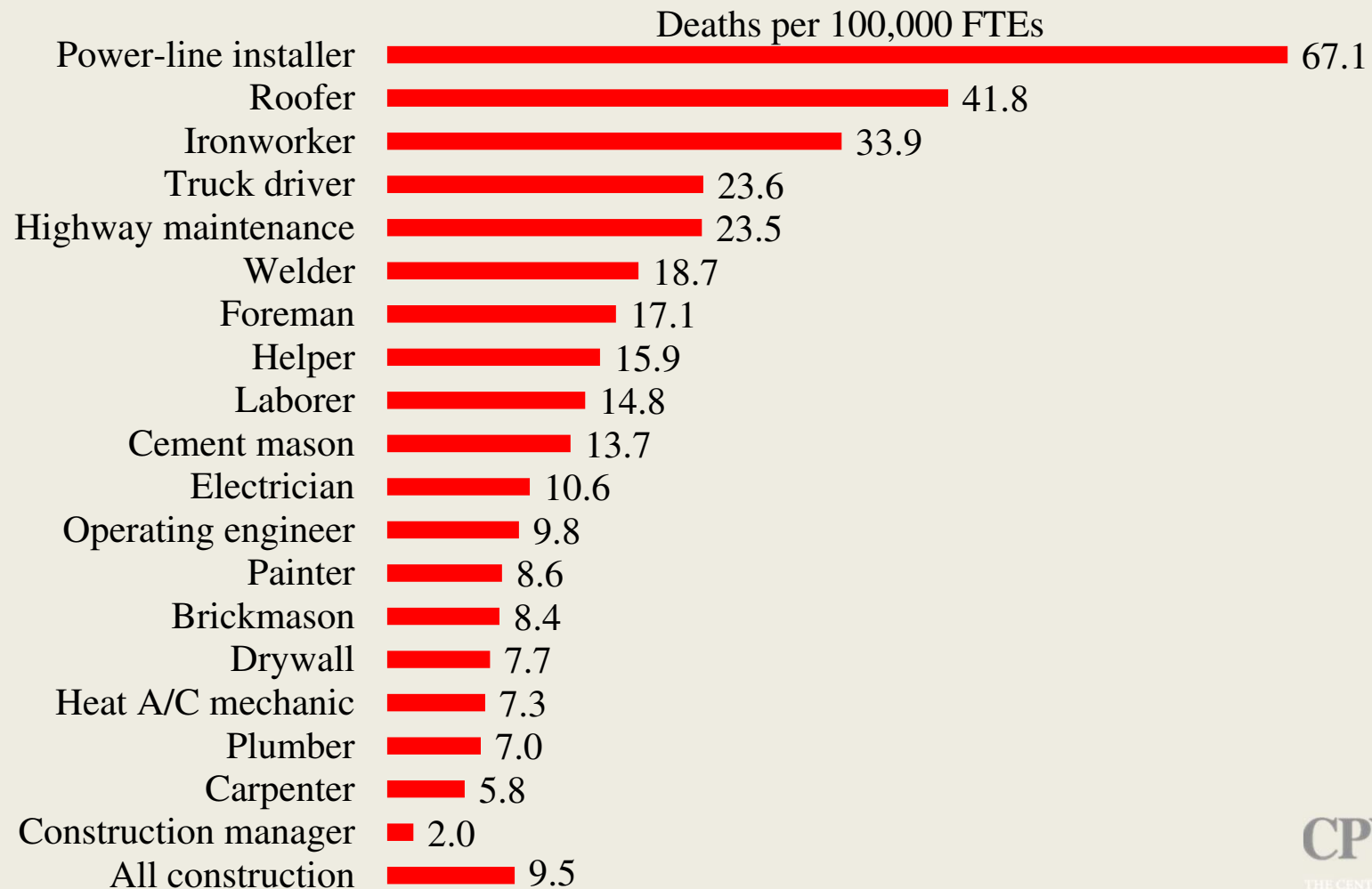
**40e. Rate of nonfatal injuries resulting in days away from work in construction, by state, 2011-2015 average (Private wage-and-salary workers)**



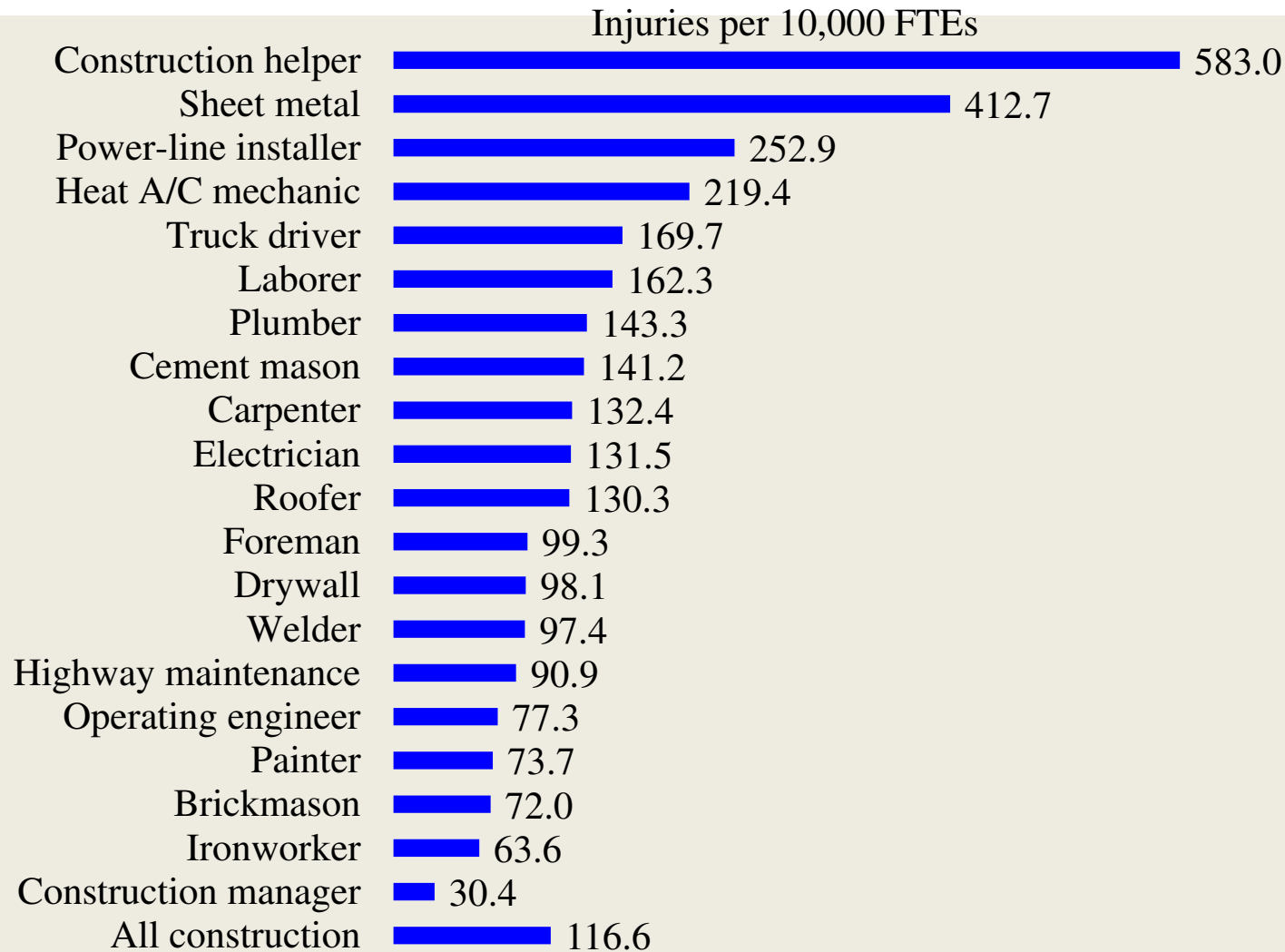
Injuries per 10,000 FTEs



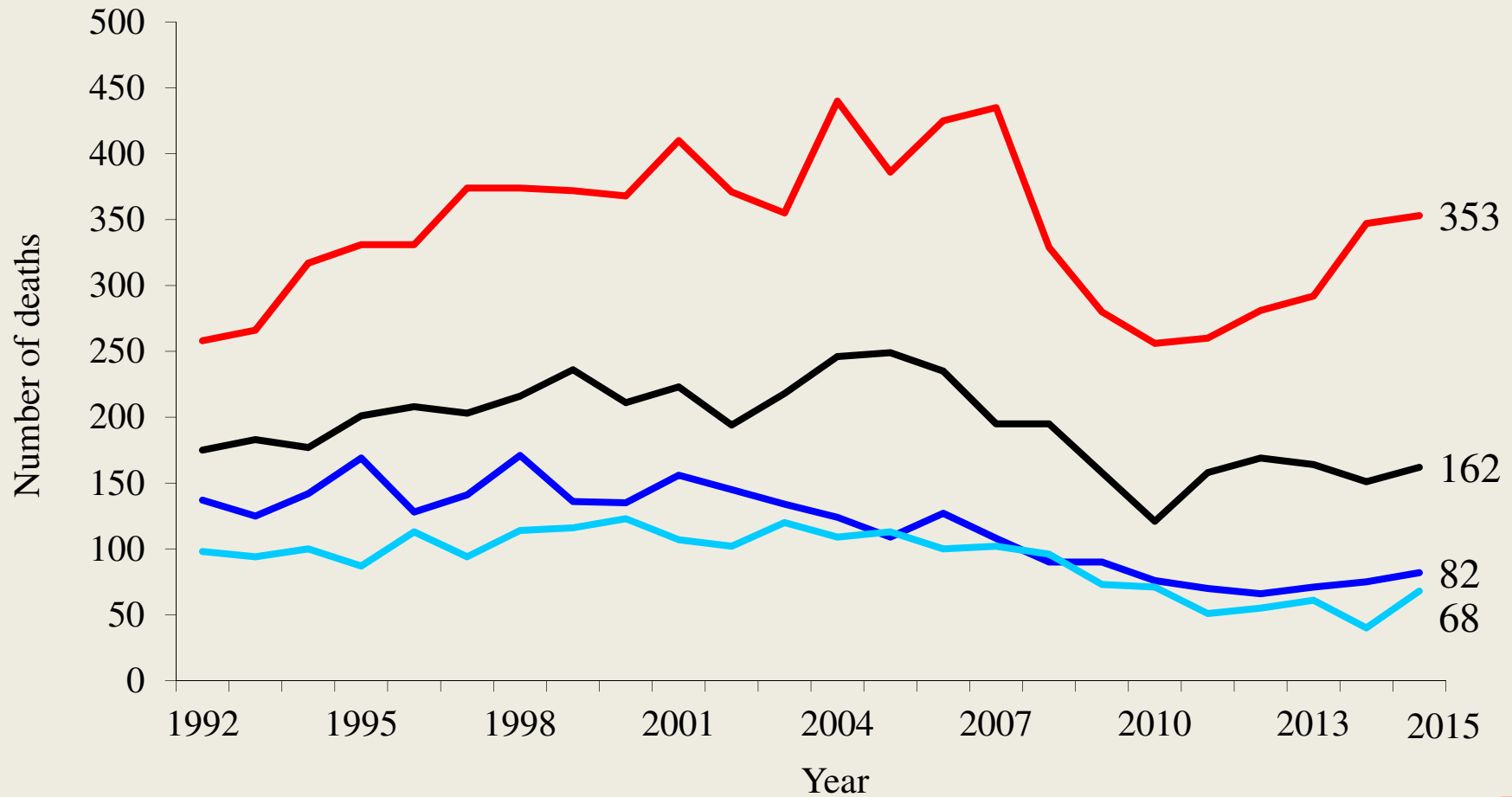
## 42c. Rate of fatalities, selected construction occupations, 2011-2015 average (All employment)



**42d. Rate of nonfatal injuries resulting in days away from work, selected construction occupations, 2011-2015 average (Private wage-and-salary workers)**



# 43c. Leading causes of fatalities in construction, 1992-2015 (All employment)



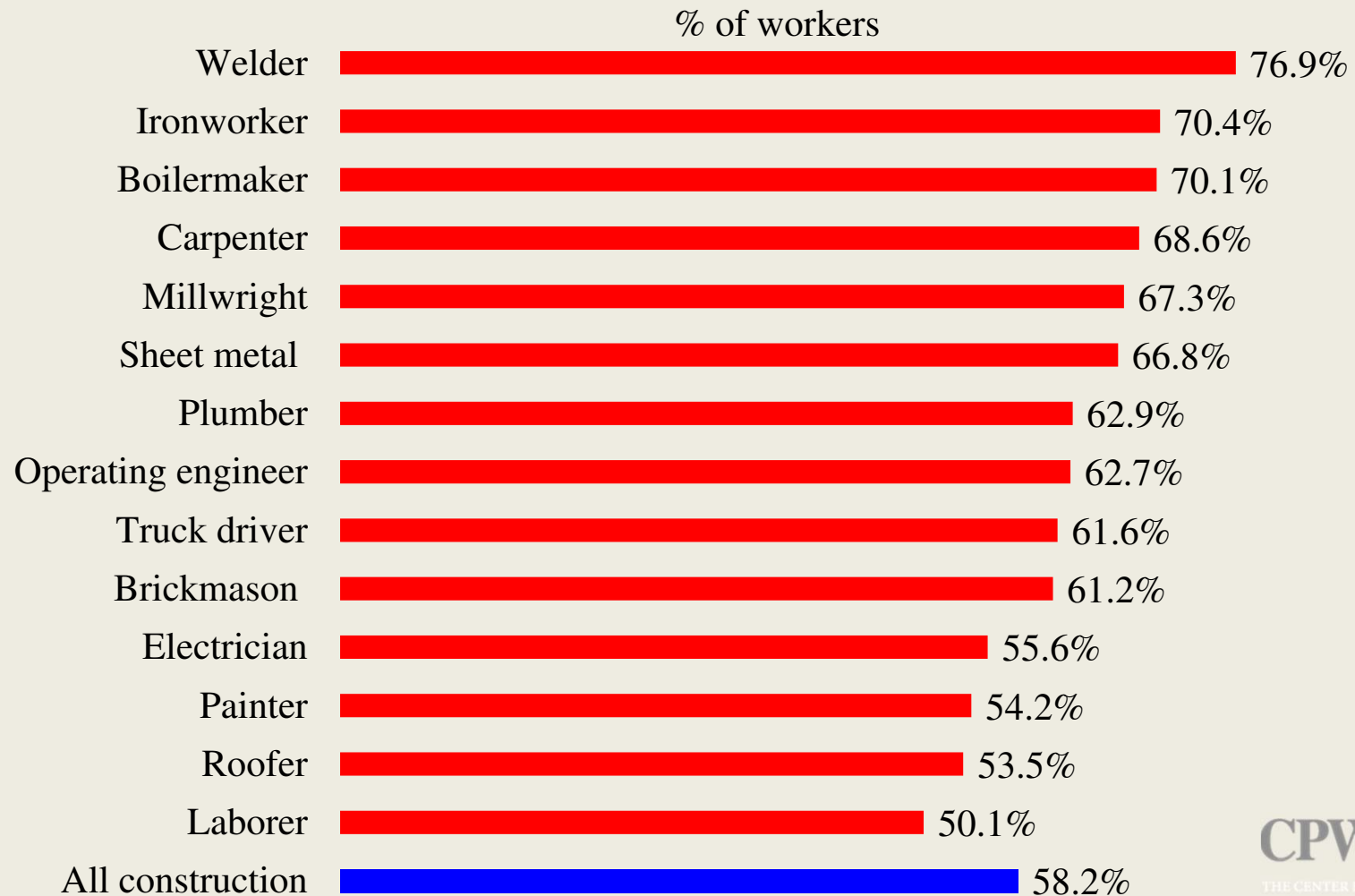
— Fall to lower level

— Struck-by

— Electrocution

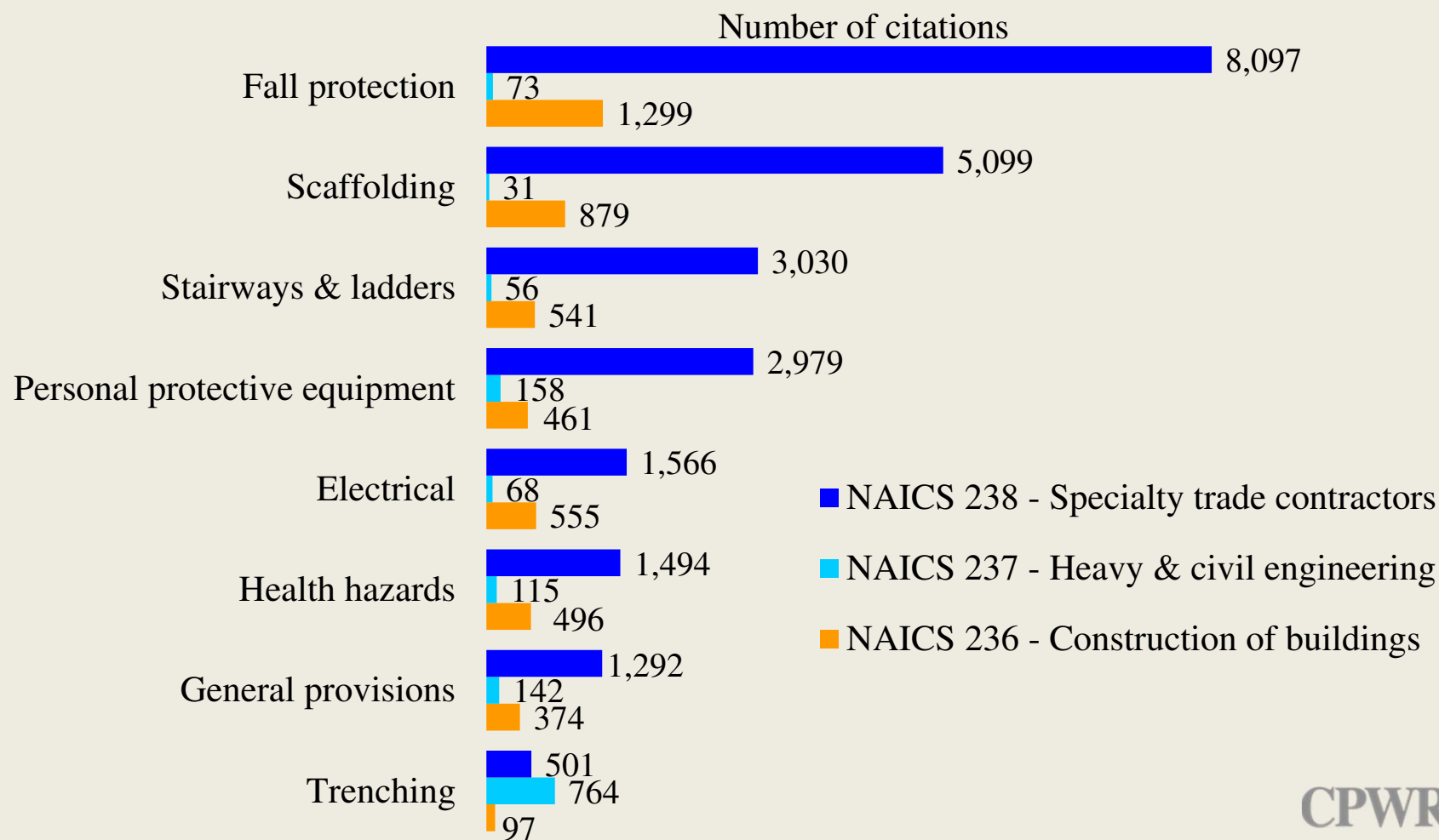
— Caught-in/between

## 50f. Prevalence of noise-induced material hearing impairment, selected occupations in construction, 1996-2015

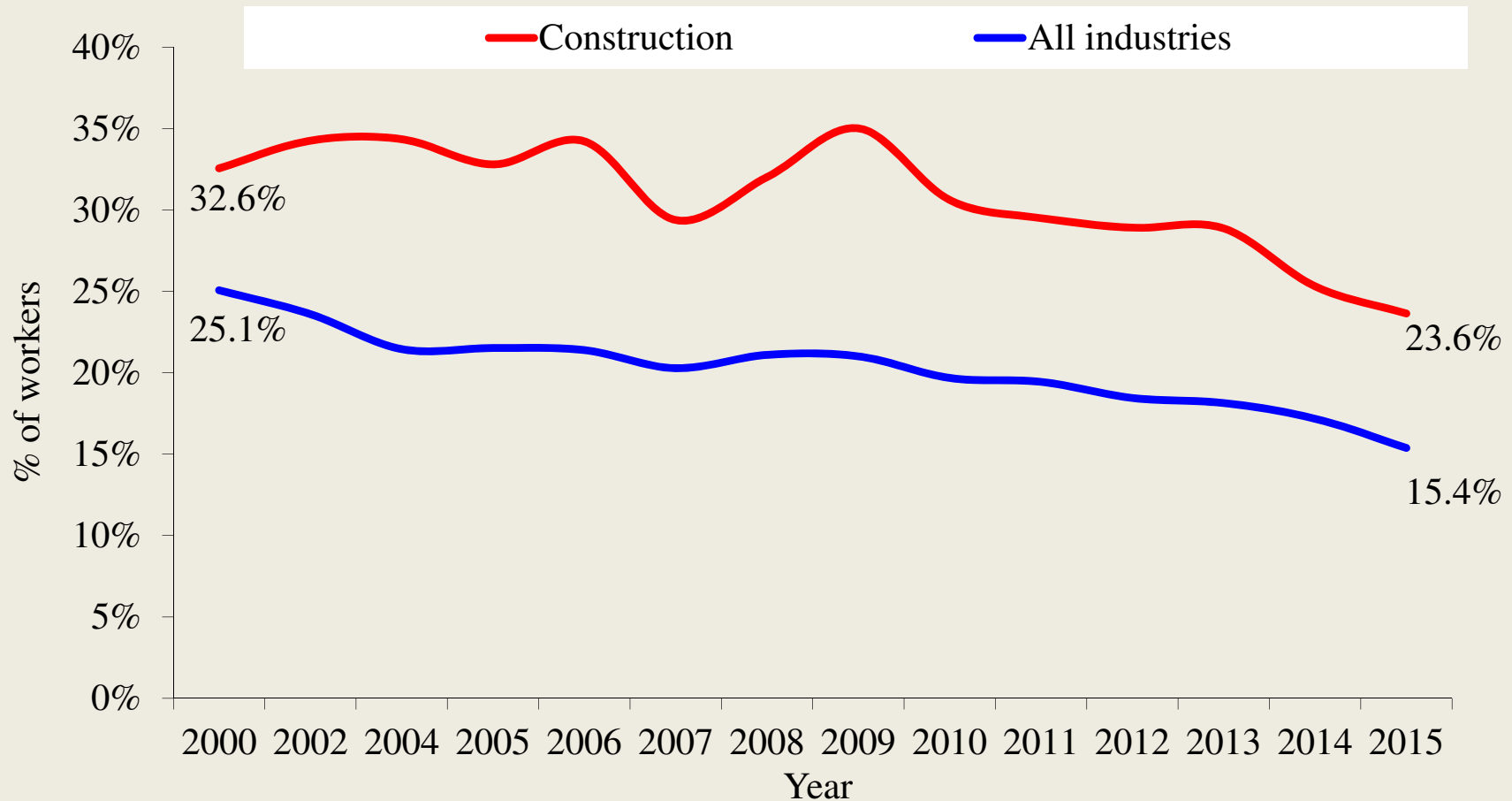




## 53b. OSHA federal citations by major violation category and construction sector, 2015



## 55a. Percentage of current smokers, construction versus all industries, 2000-2015, selected years



# The Construction Chart Book



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The screenshot shows a web browser window displaying the CPWR website. The browser's address bar shows the URL <https://www.cpwr.com/publications/construction-chart-book>. The website header includes the CPWR logo and the word "PUBLICATIONS" in large white letters over a background image of construction workers. A navigation menu at the top left has "publications" selected. A sidebar on the left lists various content categories, with "the construction chart book" highlighted by a red arrow. The main content area features the title "The Construction Chart Book" and a description of the sixth edition. A "Previous Editions" section lists links to the 3rd, 4th, and 5th editions. A list of new features is provided at the bottom of the main content area. The Windows taskbar at the bottom shows various application icons and the system clock indicating 5:11 PM on 6/4/2018.

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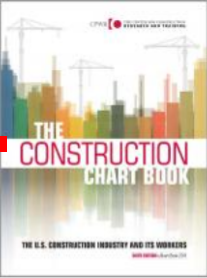
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## The Construction Chart Book



The sixth edition of *The Construction Chart Book – The U.S. Construction Industry and Its Workers* continues to present the most complete data available on all facets of the U.S. construction industry: economic, demographic, employment/income, education/training, and safety and health issues, plus much more all in one place.

This new edition not only offers on-demand access to the charts and data, but also includes interactive features that enhance the user's experience. Users can click on terms to access definitions instantly, and easily enlarge charts and tables within each page.

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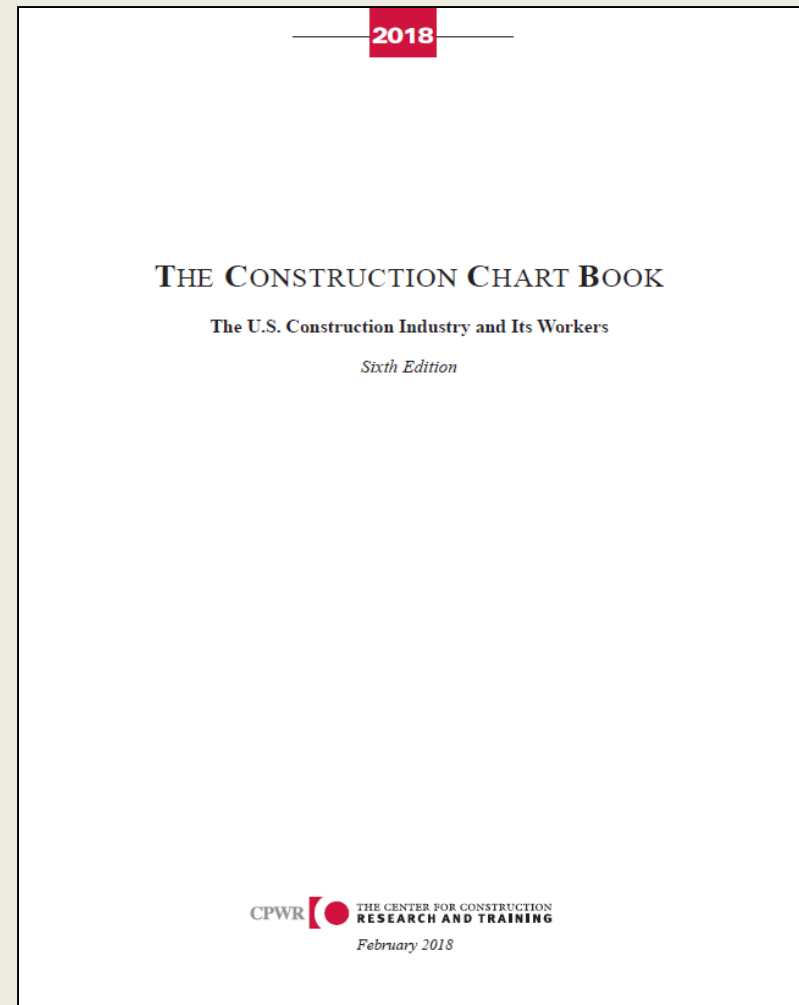
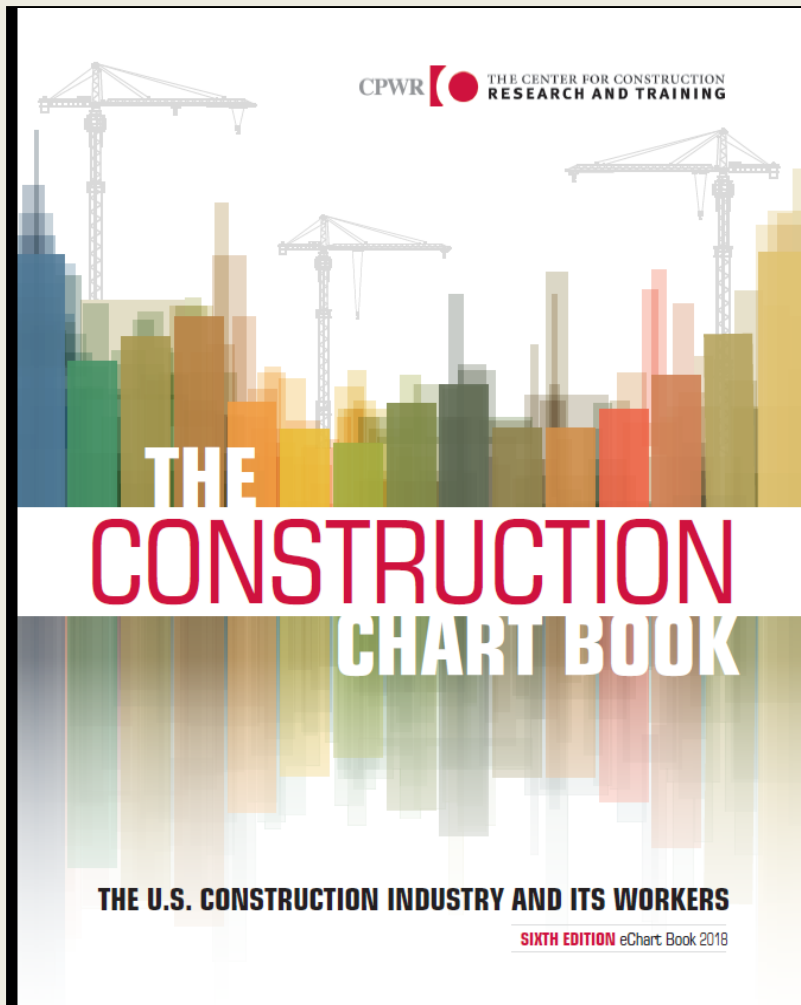
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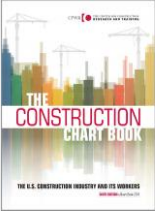
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When using information appearing in *The Construction Chart Book*, please credit: **CPWR – The Center for Construction Research and Training, produced with support from the National Institute for Occupational Safety and Health grant number OH009762.**

The authors of the *Chart Book* suggest reading the text and notes that accompany the charts, as explanations and nuances within the data

# Pages in PDF

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  - Copyright & Contact
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  - Abbreviations
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  - Labor Force Characteristics
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  - Fatal and Nonfatal Injuries**
  - Occupational Diseases
  - OSHA Enforcement and Injury Costs
  - Health Indicators and Services
  - ANNEX: How To Calculate The "Real" Wage
  - References
  - Glossary
  - Acknowledgements
  - Print The Chart Book

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## Fatal and Nonfatal Construction Injuries in Selected Industrial Countries

In 2013, construction fatal injury rates reported by selected industrial countries ranged from 1.0 to 24.6 deaths per 100,000 workers (chart 37a). The reported construction fatality rate in the United States was relatively high among these countries, at 9.7 deaths per 100,000 full-time equivalent workers (FTEs, see Glossary). This rate was lower than the rates for Switzerland and Belgium, but more than triple the rate for Finland and Australia, and more than five times the rate for the United Kingdom and Sweden.

In contrast, the nonfatal injury rate in the U.S. construction industry was relatively low compared to most selected countries, at 1.5 injuries per 100 FTEs in 2013 (chart 37b), which suggests nonfatal injuries may be underreported (see pages 38, 40, and 41). Compared to the U.S., France, Spain, Finland, and Germany had lower fatality rates but higher nonfatal injury rates.

Most of the data reported here are from the International Labour Organization (ILO),<sup>1</sup> which compiles statistics on fatal and nonfatal occupational injuries provided by represented countries. Due to the wide variability in data collection and reporting, comparisons across countries must be made with caution.

Except for the United States, most countries use insurance and administrative records as data sources (chart 37c). The U.S. collects data through the Census of Fatal Occupational Injuries and the Survey of Occupational Injuries and Illnesses (see page 38). Countries that base their data on insurance records include only insured employees in their calculations; some include all reported cases, while others include only events that result in compensation.

Inclusion of self-employed workers differs by country as well. Germany covers both wage-and-salary workers and self-employed workers, whereas in Canada, self-employed workers are included if they opt for coverage, and in the United Kingdom, certain self-employed workers are subject to exemption. Other countries such as Australia exclude self-employed workers.<sup>2</sup> In the United States, self-employed workers are included in the fatality data, but excluded in the nonfatal injury data.

Another variable among injury rates is how the selected countries classify injuries from commuting accidents. Some of the selected countries, such as the U.S. and Australia, do not count workers' injuries from road traffic accidents as work-related if they occurred during commuting. However, such injuries can be counted as work-related in Canada if a review board determines it is work-related, while in the United Kingdom, they must meet certain reportable criteria.<sup>2</sup>

Fatalities in some countries, such as Australia, Canada, Germany, Switzerland, and the United Kingdom, include deaths from occupational diseases (chart 37c), while the United States and other countries on the list only include deaths due to occupational injuries.

Countries also have different time periods for qualifying deaths and injuries as work-related. Australia, Belgium, Finland, France, and the United Kingdom count fatalities that occurred in the same calendar year as the accident (chart 37c). By contrast, Switzerland counts deaths that occur within the same fiscal year. Germany and Sweden count deaths that occur within one year of the accident, and Spain uses five days as the cutoff point. Similarly, some countries include only injuries with a minimum period of incapacitation. For instance, in Australia, an injury is counted if a worker has been incapacitated for at least five workdays, whereas in Switzerland there is no minimum period of absence.

Some countries are more likely to have full-time employment with one employer (such as in Northern Europe), but in others, construction workers do not work full-time. Therefore, using FTEs allows construction sector data to be more comparable. However, only a few countries adjust injury rates using FTEs. In addition, countries such as Belgium, Finland, Sweden, and Switzerland have a relatively small construction workforce. Thus, injury rates in those countries may be more variable.

Changes in data classifications are yet another source of variability. The ILO asks the reporting agencies in each country to align their data with the International Standard Industrial Classification (ISIC) of all Economic Activities. Yet, the ISIC system has changed over time and not all countries adopted the latest version in the same year. For example, while most countries presented on this page reported data using the fourth revision of the ISIC, Australia reported data using the third revision of the ISIC. The classification systems may be similar enough to allow general comparisons at a broad level, but the comparisons may be limited within construction subsectors across countries and time periods.

1. International Labour Organization, ILOSTAT - ILO database of labour statistics. <http://www.ilo.org/global/statistics-and-databases/lang-en/index.html> (Accessed December 2017).  
 2. U.S. Bureau of Labor Statistics, 2017. Counting injuries and illnesses in the workplace. An informational review. Monthly Labor Review. <https://www.bls.gov/opub/mlr/2017/article/counting-injuries-and-illnesses-in-the-workplace.htm> (Accessed December 2017).

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### 37a. Rate of fatalities in construction, selected countries, 2013

Country	Rate per 100,000 workers
Switzerland#	24.6
Belgium	10.5
United States#	9.7
France	9.3
Canada	7.3
Spain	6.2
Germany*	4.0
Finland	3.0
Australia	2.2
United Kingdom	1.9
Sweden	1.0

### 37b. Rate of nonfatal injuries in construction, selected countries, 2013

Country	Rate per 100 workers
Switzerland#	7.5
France	6.7
Spain	6.0
Finland	5.5
Belgium	5.3
Germany*	5.0
Canada*	2.0
Australia	1.6
United States#	1.5
Sweden	1.1
United Kingdom	0.3

### 37c. Factors and criteria of construction fatalities and nonfatal injuries, selected countries, 2013

Country	Number of Deaths	Period after Incident for Qualifying Death as Work-Related	Includes Deaths from Work-Related Diseases?	Number of Injuries	Period of Incapacity for Qualifying Injury as Work-Related	Injuries Covered	Source/Record Type	Total Employment (in Thousands)
Australia	21	Within same year	Yes	10,885	5+ workdays	Compensated	Administrative	1,008
Belgium	22	Within same year	No	11,052	1+ workdays	Reported	Insurance	330
Canada*	221	No specified period	Yes	27,432	1+ workdays	Compensated	Administrative	1,370
Finland	4	Within same year	No	7,327	2+ workdays	Compensated	Insurance	176
France	131	Within same year	No	94,770	1+ workdays	Compensated	Insurance	1,782
Germany	87	Within 1 year	Yes	108,124	2+ workdays	Reported	Insurance	2,685
Spain	43	Within 5 days	No	41,861	1+ workdays	Reported	Insurance	1,029
Sweden	4	Within 1 year	No	3,429	1+ workdays	Reported	Administrative	317
Switzerland#	76	Within same fiscal year	Yes	21,082	No minimum period of absence	Reported	Administrative	297
United Kingdom	39	Within same year	Yes	6,109	3+ workdays	Reported	Insurance	2,157
United States#	828	No specified period	No	82,040	1+ workdays	Reported	Census/Survey	9,271

Note: All charts - An asterisk "\*" (Germany denotes data calculated by the CPWR Data Center. Countries marked with a pound sign "#" (Switzerland and the United States) use FTEs to adjust rates. Data for the U.S. on this page are coded by ILO for comparison purposes and exclude government employees. Thus, the numbers for the U.S. may not be comparable with the data coded by NAICS reported on other pages of this Chart Book. A case "\*" (Canada) denotes the number of nonfatal injuries in Canada as from Association of Workers' Compensation Boards of Canada (AWCBC), National Work Injury/Disease Statistics Program (NWIDSP). Employment data are from Canada Statistics. Calculations by the CPWR Data Center.  
 Charts 37a and 37b - Rates were reported by each individual country separately from the numbers presented in Chart 37c. Due to the wide variability in data collection and reporting, comparisons across countries must be made with caution.  
 Chart 37a - Rates are defined as follows: 1) Per 100,000 workers insured - Belgium, France, Spain; 2) Per 100,000 workers employed - Australia, Canada, Finland, Germany, Sweden, United Kingdom; 3) Per 100,000 FTEs (200,000,000 hours worked) - Switzerland, United States.  
 Chart 37b - Rates are defined as follows: 1) Per 100 workers insured - Belgium, France, Spain; 2) Per 100 workers employed - Australia, Canada, Finland, Germany, Sweden, United Kingdom; 3) Per 100 FTEs (200,000,000 hours worked) - Switzerland, United States.  
 All Charts - International Labour Organization, ILOSTAT - ILO database of labour statistics. <http://www.ilo.org/global/statistics-and-databases/lang-en/index.html>; Bureau of Labor Statistics, 2017. Counting injuries and illnesses in the workplace. An informational review. Monthly Labor Review. <https://www.bls.gov/opub/mlr/2017/article/counting-injuries-and-illnesses-in-the-workplace.htm> (Accessed December 2017).



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hyperlinked to enable users to further explore these sources.

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- Browser Tabs:** The Construction Chart B, Economic Census By Year, Fatality Map | Stop Const.
- Address Bar:** <https://www.cpwr.com/construction-chart-book-6th-edition-foreword>
- CPWR Logo:** THE CENTER FOR CONSTRUCTION RESEARCH AND TRAINING
- Navigation Menu:** about, news & events, publications
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- Main Text:**

### The Construction Chart Book (6th edition) Foreword

Today, we have access to knowledge sources worldwide in a matter of seconds. Yet with all this information, we still seem to have a deficit of facts that we can use with absolute surety of their accuracy. So we take special pleasure in writing a foreword to a book of numbers based in facts.

*The Construction Chart Book: The U.S. Construction Industry and Its Workers* delivers an assessment of where we stand as an industry, based on the most recent data available from trusted public and private sources. The book covers construction industry economics, demographics, and changes to employment and training, in addition to safety hazards and dangerous chemicals that can compromise life and health. In short, this book examines aspects of construction that affect every man and woman working in our industry.

This sixth edition sheds light on issues that have arisen in the last few years. With facts and charts we see trends and identify issues that affect workers and industry. If you want to know unionization in the construction industry, go to page 12, which tells you that about 1.2 million construction workers were union members in 2016, 100,000 more than that in 2015; and union market share reached 42% to 50% in the Heavy Civil/Industrial sector. Where can you find the number of U.S. construction workers who've gone back to work since the economic downturn? Page 20. Page 22 shows the
- Table of Contents:**
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  - ▶ [Education and Training](#) (29-31)
  - ▶ [Hazards and Exposures](#) (32-36)
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# https://www.cpwr.com/publications/chart-book-6th-edition-labor-force-characteristics-labor-force-structure-and

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million (75.4%) reported they were [wage-and-salary](#) (see Glossary) workers. These proportions have shifted over the last five years. Between 2010 and 2015, the segment of self-employed workers declined from 27.9% to 24.5%, while the portion of private wage-and-salary workers grew from 67.2% to 71.6% (chart 10b). This suggests workers had no alternative but self-employment during the economic downturn, and workers preferred to take wage-and-salary jobs once the economy recovered (see page [22](#)). The share of government employees in construction also declined slightly (from 4.9% to 3.9%), indicating that job opportunities for directly employed construction workers in the public sector are still limited.

These numbers were estimated from the Current Population Survey (CPS), a monthly household (self-reported) survey sponsored jointly by the U.S. Census Bureau and the U.S. Bureau of Labor Statistics. The CPS is a major source of labor force statistics, collecting demographic and employment information, such as gender, age, race, Hispanic origin, industry and occupational groups, unionization, hours of work, and information on unemployment.<sup>2</sup> In addition to the regular monthly surveys, CPS supplements collect information on topics related to the labor market and economy, such as health insurance coverage (see page [26](#)), pension plans (see page [27](#)), and computer and Internet usage (see page [29](#)).

The CPS classifies the labor force as either employed or unemployed. Employed persons comprise all who, during the reference week: 1) did any work for pay or profit, or worked 15 hours or more as an unpaid worker in a family enterprise, or 2) had a job but was not working because of illness, bad weather, vacation, labor-management dispute, or because they were taking time off for personal reasons. Persons are classified as [unemployed](#) (see Glossary) if they did not work during the reference

## Characteristics

10. **Labor Force Structure and Definitions**
11. [Occupational Classifications and Employment Distributions in Construction](#)
12. [Union Membership and Coverage in Construction and Other Industries](#)
13. [Worker Age in Construction and Other Industries](#)
14. [Age of Construction Workers by Union Status, Hispanic Ethnicity, Type of Employment, and Occupation](#)

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- Mission Statement:** CPWR is dedicated to reducing occupational injuries, illnesses and fatalities in the construction industry. Through our research, training, and
- Main Content:**
  - ## Chart Book (6th edition): Labor Force Characteristics - Worker Age in Construction and Other Industries
  - ### 13. Worker Age in Construction and Other Industries
  - The labor force in the U.S. is steadily and rapidly aging. Between 1985 and 2015, the average age of all U.S. workers increased by 4.9 years, but among construction workers it jumped 6.5 years (chart 13a). Since the economic downturn, the pace of aging in the construction industry has exceeded the pace for all industries combined. The average age of construction workers increased by two years over a seven-year time frame, jumping from 40.5 years in 2008 to 42.5 years in 2015, whereas the average age for all workers increased by less than a year during the same period. In addition, the aging construction workforce was strongly associated with the trend of construction employment. During the housing boom (see page 6), a large number of young workers (particularly young Hispanic workers, see page 14) entered the construction industry, which expanded the age gap between this industry and the overall workforce (chart 13a). This trend reversed during the economic downturn beginning in 2007, as more than two million construction workers lost their jobs within three years (see page 20). While younger construction workers may be more likely to lose their job and less likely to find a job, older workers may stay in the construction industry longer for financial reasons when the economy is not doing well.<sup>1,2</sup>
- Right Sidebar:**
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# https://www.cpwr.com/chart-book-6th-edition-labor-force-characteristics-worker-age-construction-and-other-industries

The screenshot shows a web browser window with the following content:

- 13a. Average age of workers, construction versus all industries, 1985-2015 (All employment)**  
Line chart showing the average age of workers in years from 1985 to 2015. The y-axis ranges from 35 to 43. The x-axis shows years from 1985 to 2015. Two lines are plotted: 'Construction' (red) and 'All industries' (blue). Both lines show an upward trend, with 'All industries' consistently higher than 'Construction' until around 2010, after which they converge.
- 13b. Average age of workers, by industry, 2015 (Wage-and-salary workers)**  
Horizontal bar chart showing the average age of workers in years for various industries in 2015. The y-axis lists industries, and the x-axis shows the average age in years.

Industry	Average age of workers (in years)
Public admin	45.2
Transportation & Utilities	44.4
Manufacturing	43.4
Finance	43.2
Construction	40.8
Services	40.7
Mining	40.7
Agriculture	40.1
Wholesale & Retail	39.2
All industries	41.4
- 13c. Age distribution in construction, selected years, 1985-2015 (All employment)**  
Stacked bar chart showing the age distribution in construction for selected years from 1985 to 2015. The y-axis shows percentages from 0% to 100%.

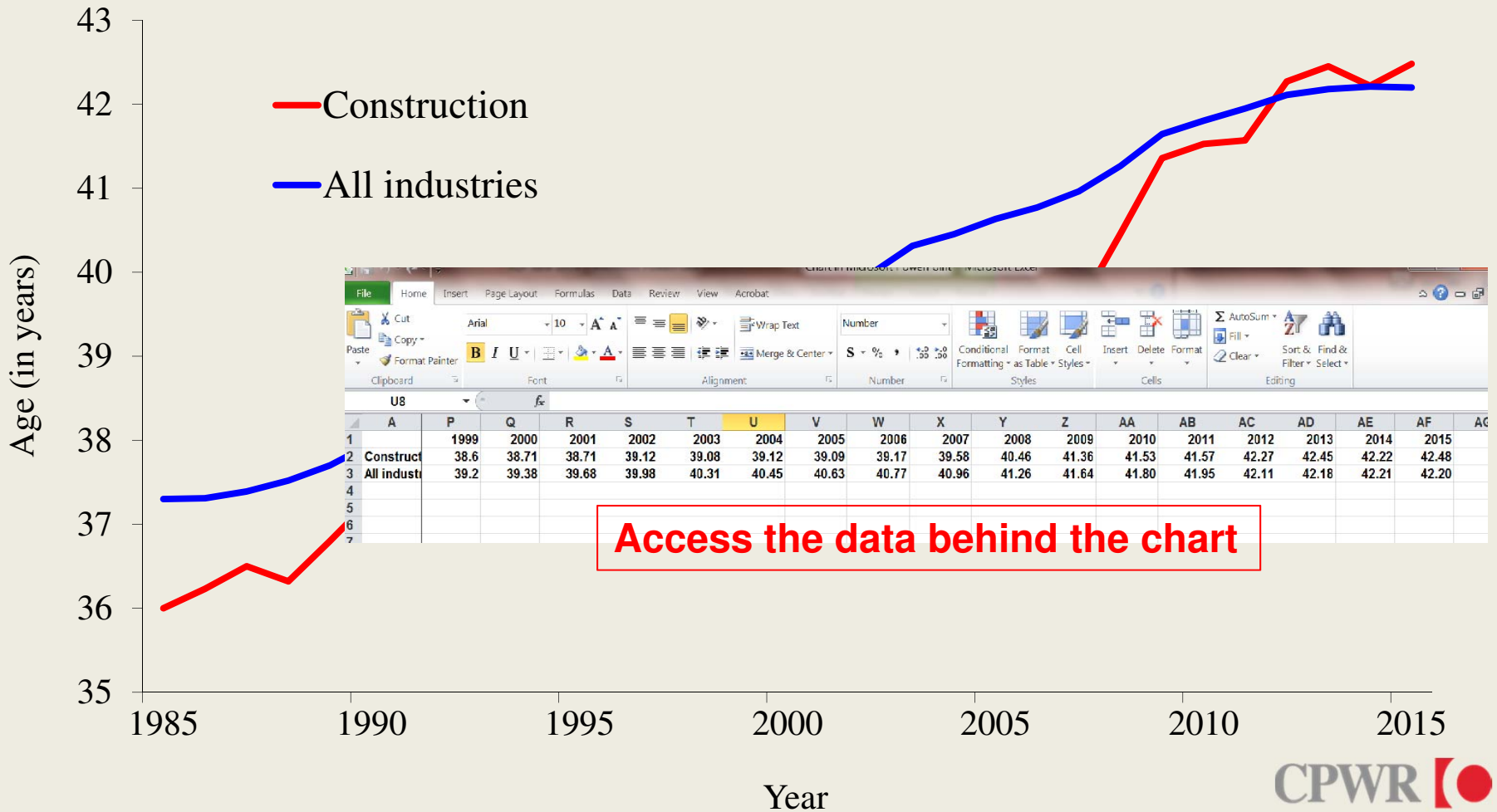
On the right side of the page, there is a navigation menu for section 19:

- 19. [Women Workers in Construction and Other Industries](#)
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  - ▶ [Education and Training](#) (29-31)
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  - ▶ [Fatal and Nonfatal Injuries](#) (37-49)
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  - ▶ [OSHA Enforcement and Injury Costs](#) (52-54)
  - ▶ [Health Indicators and Services](#) (55-56)
  - ▶ [Annex: How to Calculate The "Real" Wage](#)
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A red circle highlights the text **Download charts in PowerPoint** located at the bottom right of the chart area.

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# 13a. Average age of workers, construction versus all industries, 1985-2015 (All employment)

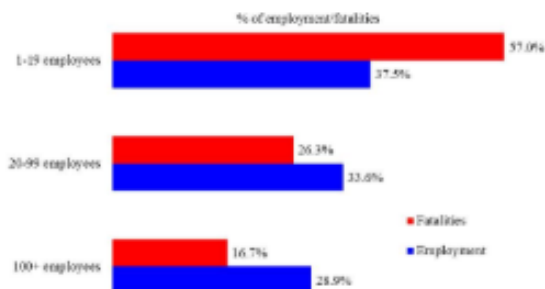


# <https://www.cpwr.com/chart-book-6th-edition-fatal-and-nonfatal-injuries-fatal-and-nonfatal-injuries-construction>

(Click on the image to enlarge or download PowerPoint or PDF versions below.)



**40b. Distribution of construction fatalities and employment, by establishment size, 2015 (Wage-and-salary workers)**



[Construction Sites](#)

48. [Musculoskeletal Disorders in Construction and Other Industries](#)

49. [Back Injuries in Construction and Other Industries](#)

▶ [Occupational Diseases \(50-51\)](#)

▶ [OSHA Enforcement and Injury Costs \(52-54\)](#)

▶ [Health Indicators and Services \(55-56\)](#)

▶ [Annex: How to Calculate The "Real" Wage](#)

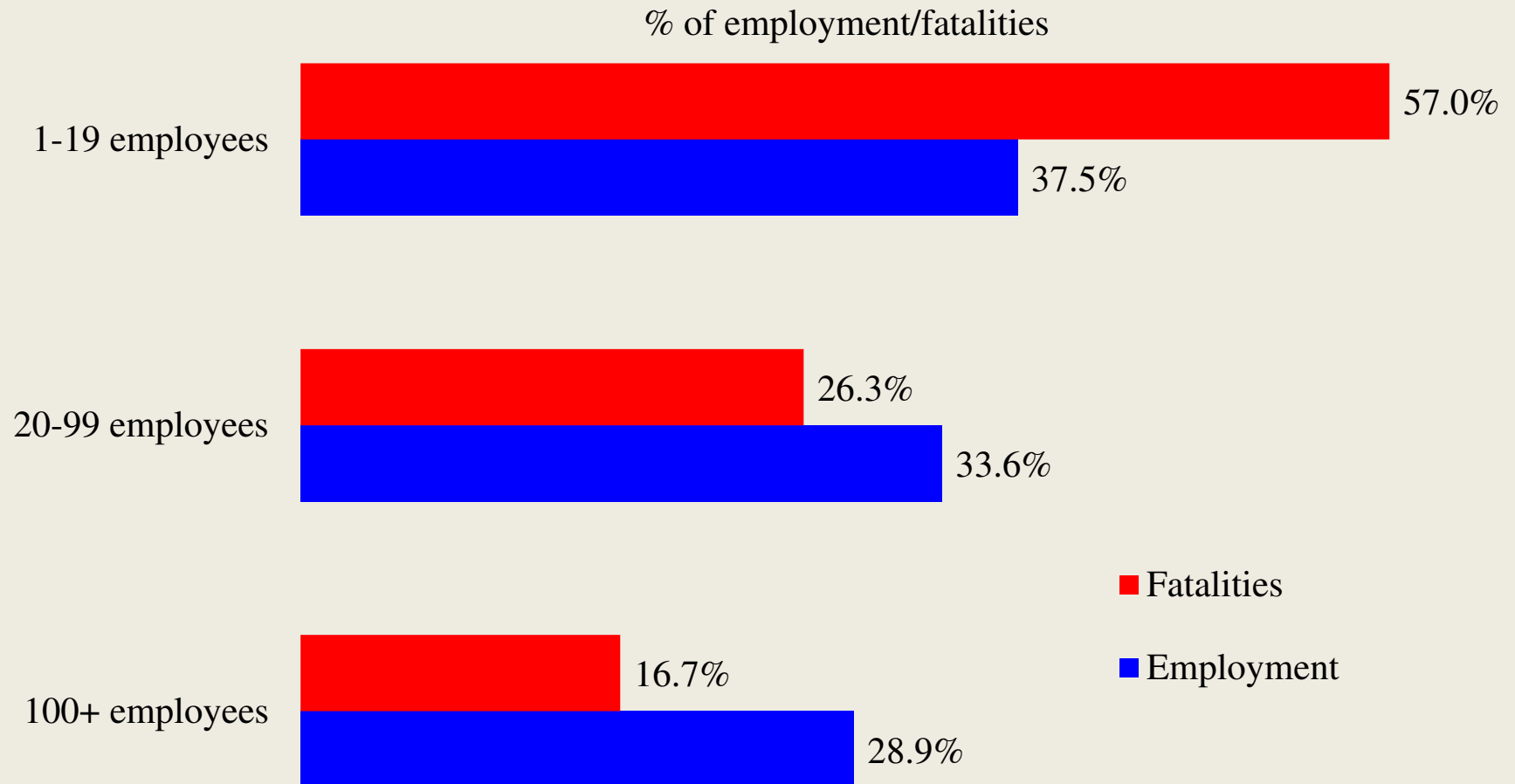
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# Distribution of construction fatalities and employment, by establishment size, 2015 (Wage-and-salary workers)





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## 40. Fatal and Nonfatal Injuries in Construction by Employment, Establishment, and Geographic Trends

From 1992 to 2015, a total of 25,705 construction workers died from work-related injuries, an annual average of about 1,071 deaths. Among the fatally injured construction workers, 16.5% (4,230 workers) were self-employed<sup>1</sup> (chart 40a). The number of fatal injuries in construction decreased during the economic downturn from 2007 through 2011, and then increased afterward, particularly among [wage-and-salary](#) (see Glossary) workers.

Small establishments, which form the largest segment of the construction industry (see page 2), suffer a disproportionate share of fatal work injuries. Between 1992 and 2015, 7,235 construction deaths (42% of deaths among wage-and-salary workers) occurred in establishments with 10 or fewer employees, even though less than 30% of construction workers were employed in such small establishments.<sup>2</sup> In 2015 alone, 57% of construction deaths occurred in establishments with fewer than 20 employees, yet such establishments employed just 37.5% of the wage-and-salary workforce in construction (chart 40b).

Unlike fatal injuries, the rate of injuries<sup>3</sup> resulting in days away from work (DAFW) among the smallest establishments (1-10 employees) was consistently lower than that for establishments with 11-249 employees prior to 2009 (chart 40c). However, this pattern has somewhat reversed since the latest recession. From 2009 to 2015, the injury rate in the smallest establishments exceeded the rate for establishments with 11-49 employees. Additionally, although the self-employed account for 24.5% of the construction workforce (see page 22), nonfatal injuries and illnesses<sup>3</sup> among these workers remain unidentified because the U.S. Bureau of Labor Statistics (BLS) does not collect nonfatal injury data on self-employed workers.

The patterns of fatal and nonfatal injuries suggest that safety and health interventions should be enhanced among small construction establishments. The increasing nonfatal injuries among small construction establishments in recent years may be partially attributed to more accurate injury and illness reporting as well as growing vulnerable worker groups with the

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### ▶ Fatal and Nonfatal Injuries

- 37. [Fatal and Nonfatal Construction Injuries in Selected Industrial Countries](#)
- 38. [Fatal and Nonfatal Injuries in Construction and Other Industries](#)
- 39. [Fatal and Nonfatal Injuries among Construction Sectors](#)
- 40. Fatal and Nonfatal Injuries in Construction by Employment, Establishment, and**

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# https://www.cpwr.com/chart-book-6th-edition-industry-summary-payroll-establishments-and-employees-construction

Quarter4-QDR-2017.indd x Chart Book (6th edition): x Economic Census By Year x Fatality Map | Stop Const x

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### Chart Book (6th edition): Industry Summary - Payroll Establishments and Employees in Construction

#### 2. Payroll Establishments and Employees in Construction

The Economic Census, one of the main sources of information on the structure and performance of the U.S. economy, is conducted every five years by the U.S. Census Bureau and covers nearly all businesses and industries in the private, non-farm U.S. economy. The most recent Economic Census, conducted in 2012, reported 598,065 construction **establishments** (see Glossary) with payroll, an 18% decrease from 729,345 establishments in 2007 in the aftermath of the Great Recession.<sup>1</sup> Establishments without paid employees (*nonemployer*, see Glossary) are excluded from the Economic Census, and are reported separately in the annual Nonemployer Statistics series (see page 3).

According to the Economic Census definition, an establishment (with payroll) is a single physical location at which business is conducted and/or services are provided. Therefore, a company or *corporation* (see Glossary) may consist of multiple establishments or offices. An establishment usually has a permanent address and may be responsible for multiple projects at one time.

Based on this definition, the majority of construction establishments are small; about 81% of payroll establishments had fewer than 10 employees in 2012 (chart 2a). Large establishments, those with 500 or more employees, accounted for 0.1% of the total number of construction establishments with payroll, yet employed over 9% of the industry's *paid employees* (see Glossary).

The number of payroll establishments in the construction industry fluctuated with the business cycle, generally increasing until 2007, and then decreased significantly in each major construction sector (chart 2b). While the overall economy was climbing out of the recession by 2012, economic recovery was delayed in construction. The number of establishments in the Specialty Trade Contractors sector was 400,950 in 2012, about 16% less than the 2007 peak of 477,950. During this period, establishments in both Construction of Buildings and Heavy and Civil Engineering Construction also decreased by 22% and 17%, respectively.

Across business cycles, construction employment tends to be more volatile than the number of construction establishments. During the Great Recession, while the overall number of construction establishments fell by 18% between 2007 and 2012, the number of construction paid employees fell by 23% from 7.32 million to 5.67 million in the same time period. Following the trends in overall construction employment, employment in the Specialty Trade Contractors sector fell from 4.73 million to 3.62 million, a decrease of more than 23%. Employment in the Construction of Buildings sector fell by 29.6%, while the Heavy and Civil Engineering Construction sector decreased by 7.9%. These changes reflect the significant impact of the housing market in the construction industry<sup>2</sup> and the stabilizing role of government construction expenditures on non-housing projects during the Great Recession (chart 2c).

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The screenshot shows a web browser window with the URL <https://www.cpwr.com/chart-book-6th-edition-industry-summary-payroll-establishments-and-employees-construction#Establishment>. The page content includes a line chart and several definitions. A red oval highlights the definition of 'Establishment'.

**Establishment** - From the Economic Census: a single physical location, where business is conducted and services or industrial operations are performed. An establishment is classified to an industry when its primary activity meets the definition for that industry. In construction, the individual sites, projects, fields, lines, or systems of such dispersed activities are not considered to be establishments. The establishment in construction is represented by a relatively permanent main or branch office that is either 1) directly responsible for supervising such activities, or 2) the base from which personnel operate to carry out these activities. Establishments are either with or without payroll (see nonemployer).

**Paid employees** - From the Economic Census: consists of full- and part-time employees, including salaried officers and executives of corporations, who are on payroll in the pay period including March 12. Included are employees on paid sick leave, holidays, and vacations; not included are proprietors and partners of unincorporated businesses.

**Nonemployer** - From the U.S. Census Bureau: a business with no payroll or paid employees, with annual business receipts of \$1,000 or more (\$1 or more in the construction industry), and subject to federal income taxes. Most nonemployers are self-employed individuals operating very small unincorporated businesses. Nonemployers can be partnerships, sole proprietorships, or corporations without employees..

1. U.S. Census Bureau. 2012 and 2007 Economic Census. <http://www.census.gov/programs-surveys/economic-census.html> (Accessed March 2016).

2. Scopelliti DM. 2014. Housing: Before, During, and After the Great Recession. U.S. Bureau of Labor Statistics. Spotlight on Statistics. <http://www.bls.gov/spotlight/2014/housing/pdf/housing.pdf> (Accessed November 2016).

3. The average number of non-leased construction employees is the sum of establishment averages of non-leased construction workers who were on the payroll during the pay periods including the 12th of March, June, September, and

<https://www.census.gov/programs-surveys/economic-census/year.html>

The screenshot shows a web browser window with several tabs open. The active tab is titled "Economic Census By Year" and displays the URL <https://www.census.gov/programs-surveys/economic-census/year.html>. The page header includes the United States Census Bureau logo and navigation links for TOPICS, GEOGRAPHY, LIBRARY, DATA, SURVEYS/PROGRAMS, NEWSROOM, and ABOUT US. A search bar is located on the right side of the header.

The main content area is titled "Economic Census" and "Economic Census By Year". It features a navigation bar with buttons for "All", "2012", "2007", "2002", and "1997". The "2012" button is currently selected. Below this bar, there are three main sections:

- 2012 Economic Census Data**: Sources are the Census Bureau and other federal agencies, if applicable. For additional 2007 Economic Census data, please visit the subtopic pages. An icon of a data table is shown to the left.
- 2012 Economic Census Geographies**: Here you will find geographies information for the 2012 Economic Census. An icon of a map of the United States is shown to the left.
- 2012 Economic Census Library**: Read publications and working papers related to the 2012 Economic Census, view infographics and photos, watch videos, and more! An icon of a folder and documents is shown to the left.

A sidebar on the left contains a list of navigation options: About, Information for Respondents, Data, Economic Census By Year (highlighted), Events, Geographies, Data Users, Guidance for Geographies Users, Library, News & Updates, and Technical Documentation.

In the bottom right corner, there is a feedback box that asks "Is this page helpful?" with "Yes" and "No" options.

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injuries among Finish Carpentry Contractors (NAICS 23835) and Tile and Terrazzo Contractors (NAICS 23834) was 52% higher than that for all construction (56.1 versus 37.0 per 10,000 FTEs; chart 48e). Residential Building Construction (NAICS 2361) also had a high rate of overexertion injuries at 47.1 per 10,000 FTEs.

About 65% of WMSDs in construction were related to sprains, strains, and tears (chart 48f). Such injuries may develop into chronic conditions and permanent disabilities.<sup>3,4</sup> Task-specific ergonomic innovations to reduce physical workload are important to mitigate the risk of WMSDs and to facilitate sustained employment,<sup>3-6</sup> such as the revised [NIOSH Lifting Equation \(RNLE\)](#).<sup>6</sup> Information on ergonomic solutions and ideas are also available at the [Construction Solutions database](#), [CPWR Ergonomics Handouts](#), and [CPWR Ergonomics Toolbox Talks](#).

Many available tools and technologies can reduce the risk of WMSDs, but barriers to adoption exist such as costs, uncertain return on investment, solutions not suitable for small jobs, lack of related knowledge, etc.<sup>7</sup> Factors that would improve the adoption of ergonomic interventions include the involvement and appropriate training of all affected stakeholders, changes in work systems and design, and safety culture.<sup>7</sup>

(Click on the image to enlarge or download PowerPoint or PDF versions below.)

**48a. Number and rate of work-related musculoskeletal disorders in construction, 1992-2015**

Year	Number (in thousands)	Rate (per 10,000 FTEs)
1992	55	140
1993	58	135
1994	55	130
1995	52	125
1996	50	120
1997	48	115
1998	45	110
1999	42	105
2000	40	100
2001	38	95
2002	35	90
2003	32	85
2004	30	80
2005	28	75
2006	25	70
2007	22	65
2008	20	60
2009	18	55
2010	15	50
2011	12	45
2012	10	40
2013	8	35
2014	7	32
2015	6	30

**48b. Work-related musculoskeletal disorders in construction, by body part, 2011-2015**

Year	Back	Abdomen	Arms	Legs	Multiple body parts	Shoulder
2011	45	10	5	5	5	10
2012	40	10	5	5	5	10
2013	40	10	5	5	5	10
2014	40	10	5	5	5	10
2015	40	10	5	5	5	10

**48. Musculoskeletal Disorders in Construction and Other Industries**

49. [Back Injuries in Construction and Other Industries](#)

47. [Fatalities at Road Construction Sites](#)

46. [Fatalities from Contact with Electricity in Construction](#)

45. [Nonfatal Injuries from Falls in Construction](#)

44. [Fatal Injuries from Falls to a Lower Level in Construction](#)

43. [Leading Causes of Fatal and Nonfatal Injuries in Construction](#)

42. [Fatal and Nonfatal Injuries within Construction Occupations](#)

41. [Demographic Trends of Fatal and Nonfatal Injuries in Construction](#)

[Construction by Employment, Establishment, and Geographic Trends](#)

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CPWR is dedicated to reducing occupational injuries, illnesses and fatalities in the construction industry. Through our research, training, and service programs, we serve the industry in cooperation with key federal and construction industry partners nationwide.

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## Ergonomics Toolbox Talks

[CPWR – Carpal Tunnel Syndrome](#)

[CPWR – Materials Handling: Drywall](#)

[CPWR – Lifting and Carrying Materials](#)

[CPWR – Vibration](#)

[CPWR – Ergonomics in Construction](#) – based on information developed by [Washington University School of Medicine, Occupational Safety and Health Research](#)

[CPWR – Selecting Hand Tools](#)

[Sprains and Strains Prevention Toolbox Safety Talk](#) (developed by the Alliance Program Construction Roundtable 2010)

University of Washington St. Louis – Series of 6 Toolbox Talks on Ergonomics & Training Guide:

- [Ergonomics Tool Box Talks \(TBT\) Training Guide](#)
- [TBT1 Ergonomics in Construction](#)
- [TBT2 Keep Reach Close](#)
- [TBT3 Positioning](#)
- [TBT4 Move Materials With Assist](#)
- [TBT5 Manual Tools](#)

**Training Materials & Toolbox Talks**

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**Equipment & Tools Resulting from Research**

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**Research**

A. Current CPWR Projects Underway:

- [Interventions to Improve Safety Climate and Ergonomics In Construction SMF](#)

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# <https://www.cpwr.com/chart-book-6th-edition-industry-summary-green-construction-united-states>

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Category	Single family firms (%)	Multifamily firms (%)
General Websites	34%	32%
Print Literature	22%	16%
Retailers	34%	28%
Government Resources	11%	26%

U.S. Green Building Council. 2016. LEED project directory, 2000-2015. <http://www.usgbc.org/projects> (Accessed May 2016). Calculations by the CPWR Data Center. Does not include residential projects.

4. U.S. General Services Administration. 2016. LEED Building Information. <http://www.gsa.gov/portal/category/25999> (Accessed August 2016).
5. Dodge Data & Analytics. 2015. Smart Market Report. Green and Healthier Homes: Engaging Consumers of all Ages in Sustainable Living. <https://www.construction.com/about-us/press/green-homes-show-growth-in-a-recovering-market-according-to-new-sm-report.asp> (Accessed January 2017)
6. The National Institute for Occupational Safety and Health. 2016. Prevention through Design. <https://www.cdc.gov/niosh/topics/ptd/> (Accessed November 2016).

**Note:**

- Charts 9a-9d – LEED residential projects are not included.
- Chart 9b – “Other” includes those with multiple types of owners, other government, religious establishments, those listed as other, and those difficult to classify.
- Chart 9e – “(p)” represents market projections.

<https://www.construction.com/about-us/press/green-homes-show-growth-in-a-recovering-market-according-to-new-sm-report.asp>

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## Press Release

### Green Homes Show Growth in a Recovering Market According to New McGraw Hill Construction SmartMarket Report

NEW YORK, June 5, 2014 – Residential construction is a key engine behind economic growth in the United States. According to McGraw Hill Construction's Dodge Construction Market Forecast, single and multifamily housing projects account for about 45% of the value of all construction projects started in the United States in 2014. With that market forecasted to grow rapidly in coming years, the green activity and drivers in the market are critical. The new SmartMarket Report of the single and multifamily builder and remodeler community released today by McGraw Hill Construction (<https://www.construction.com>) contains this critical intelligence.

The report, "Green Multifamily & Single Family Homes: Growth in a Recovering Market," surveys builder and remodeler members of the National Association of Home Builders and reveals the evolution of green building for single family homes from boom to bust to recovery through

McGraw Hill Construction  
McGraw Hill Financial

## Green Multifamily and Single Family Homes: Growth in a Recovering Market

Premier Partner: **NAHB**  
Partners: **menck windows** **WM**

2016 Dodge Construction



# The Construction Chart Book



# Selection Criteria

- ✓ ***Accessibility***
- ✓ ***Validity***
- ✓ ***Reliability***
- ✓ ***Representativeness***
- ✓ ***Timeliness***
- ✓ ***Completeness***

# Data Sources (1)

## ■ Bureau of Labor Statistics (BLS):

- American Time Use Survey (ATUS)
- Business Employment Dynamics (BED)
- Census of Fatal Occupational Injuries (CFOI)
- Current Population Survey (CPS)
- CPS Supplements (January, March, May, July, August, October)
- Current Employment Statistics (CES)
- Employment Projections (EP)
- Job Openings and Labor Turnover Survey (JOLTS)
- National Compensation Survey (NCS)
- Occupational Employment Statistics (OES)
- Quarterly Census of Employment and Wages (QCEW)
- Survey of Occupational Injuries and Illnesses (SOII)

# Data Sources (2)

## ■ U.S. Census Bureau (Census):

- American Community Survey (ACS)
- Construction Economic Statistics Series
  - Construction Spending/Construction Value Put in Place (CS/VPIP)
  - New Residential Construction
    - Building Permits
    - Housing Starts
    - Housing Completions
- County Business Patterns (CBP)
- Economic Census (EC)
- Nonemployer Statistics (NS)
- Statistics of U.S. Businesses (SUSB)
- Survey of Business Owner (SBO)

# Data Sources (3)

## ■ NIOSH:

- Adult Blood Lead Epidemiology and Surveillance (ABLES)
- Fatality Assessment and Control Evaluation (FACE) (state and NIOSH in-house)
- Occupational Hearing Loss Worker Surveillance (OHL)
- Center for Workers' Compensation Studies (CWCS, Workers compensation data)

## ■ Bureau of Economic Analysis (BES):

- Gross Domestic Product (GDP)
- Survey of Current Business (SCB)

## ■ Department of Labor (DOL) Employment Training and Administration (ETA):

- Apprenticeship and Occupational Training Data
- Occupational Information Network (O\*NET)

## ■ OSHA Occupational Safety and Health Information System (OIS) / Interpreted Management Information System (IMIS)

# Data Sources (4)

## ■ National Center for Health Statistics (NCHS)

- Medical Expenditure Panel Survey (MEPS)
- National Health Interview Survey (NHIS)
- NHIS Occupational Health Supplement (2010, 2015)
- The Behavioral Risk Factor Surveillance System (BRFSS)

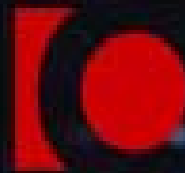
## Others:

- Building Trades National Medical Screening program (BTMed)
- Dodge Data & Analytics
  - Construction data
  - Safety Management Survey
- International Labor Organization databases (ILO)
- LEED Data (Leadership in Energy and Environmental Design; USGBC)
- Health Retirement Study (HRS)

# Thanks! Questions?



**CPWR**



**THE CENTER FOR CONSTRUCTION  
RESEARCH AND TRAINING**

**SDong@cpwr.com**

**8484 Georgia Avenue, Suite 1000**

**Silver Spring, MD 20910 USA**

**Phone: (301) 495-8500**

**Fax: (301) 578-8572**

**<http://www.cpwr.com>**

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