

IN GOOD HANDS

HOW TO CREATE SAFETY IN CONSTRUCTION

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CPWR: The Center for Construction Research and Training

www.cpwr.com

Thanks to all my Colleagues at CPWR

And in Particular

Dr. Sue Dong and Dr. Bruce Lippy

VISION ZERO

Safety.Health.Wellbeing.

A VISION ZERO PRESENTATION

WWW.VISIONZERO.GLOBAL

Presentation Outline

Part 1: Introduction

Part 2: Let's talk about safety

Part 3: Size of employer and OSH practices

Part 4: Way forward: how to cause safety

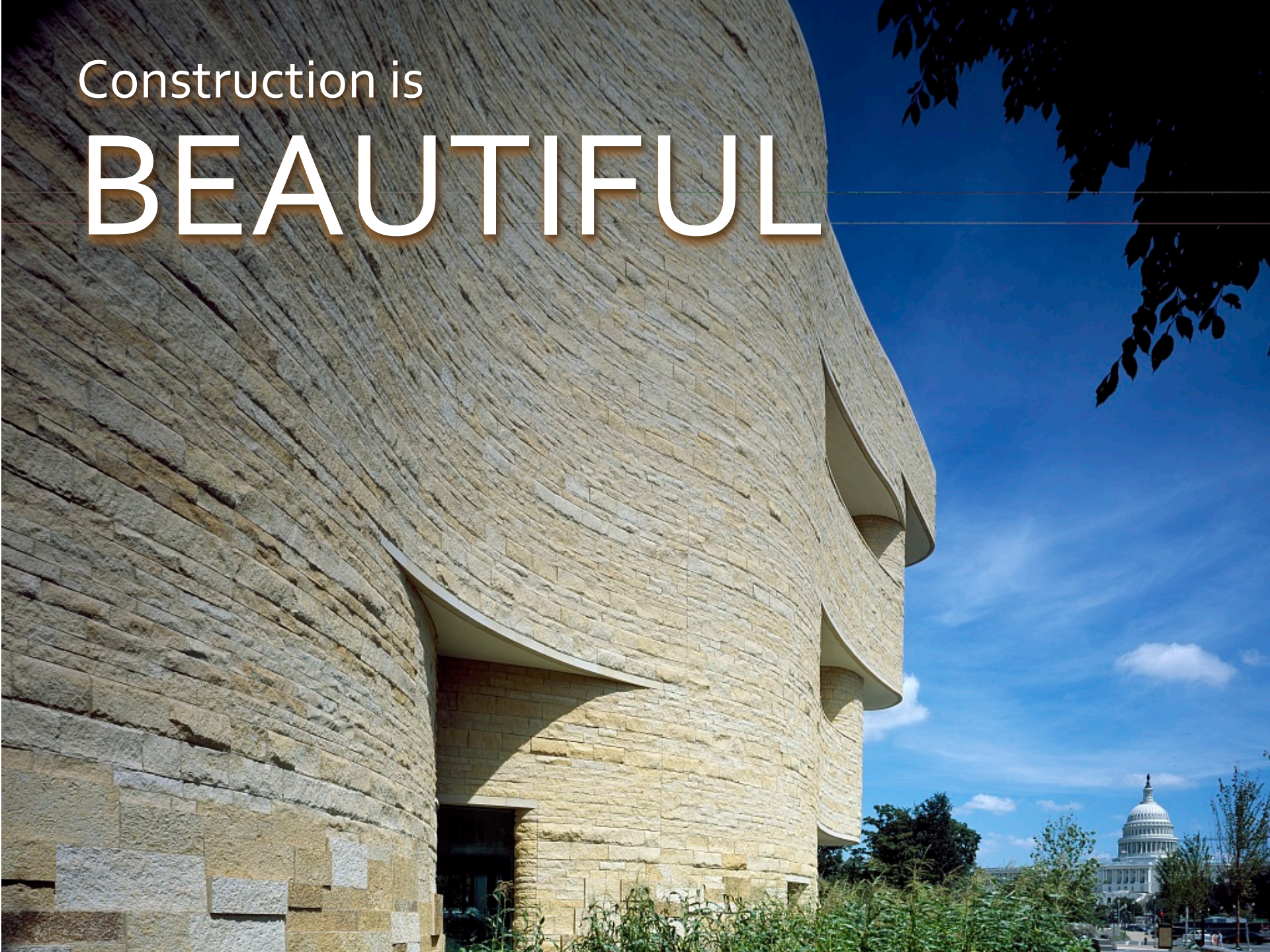
Part 5: In good hands

INTRODUCTION

Part 1

Construction is

BEAUTIFUL





CONSTRUCTION
COMPLEX



SKILLED



DIVERSE



ESSENTIAL



CONSTRUCTIONS IS

DYNAMIC



HIGH-TECH



INFRASTRUCTURE

POWERFUL





TEAMWORK

**BUT,
CONSTRUCTION
HAS OTHER FACES**

CONSTRUCTION

A photograph of construction workers on a high-rise building under construction. The workers are silhouetted against a bright sky with a layer of clouds. They are working on a complex steel framework. One worker is perched on a high beam, while others are positioned at different levels of the structure. The scene conveys a sense of height and industrial activity.

ENDANGERS



EXPOSES



CONSTRUCTION
SICKENS



CONSTRUCTION

DAMAGES



CONSTRUCTION
HURTS

CONSTRUCTION
KILLS!



LET'S TALK ABOUT SAFETY

Part Two

Will We Ever Learn?

- 1990-2010: 40-60 % reduction in risks
- 2012-2017: 20 % increase in risks
- All the gains made between 2000-2010 wiped out by failures after 2012

How did this happen?

Why did we allow it to happen?

What do we do to correct it?

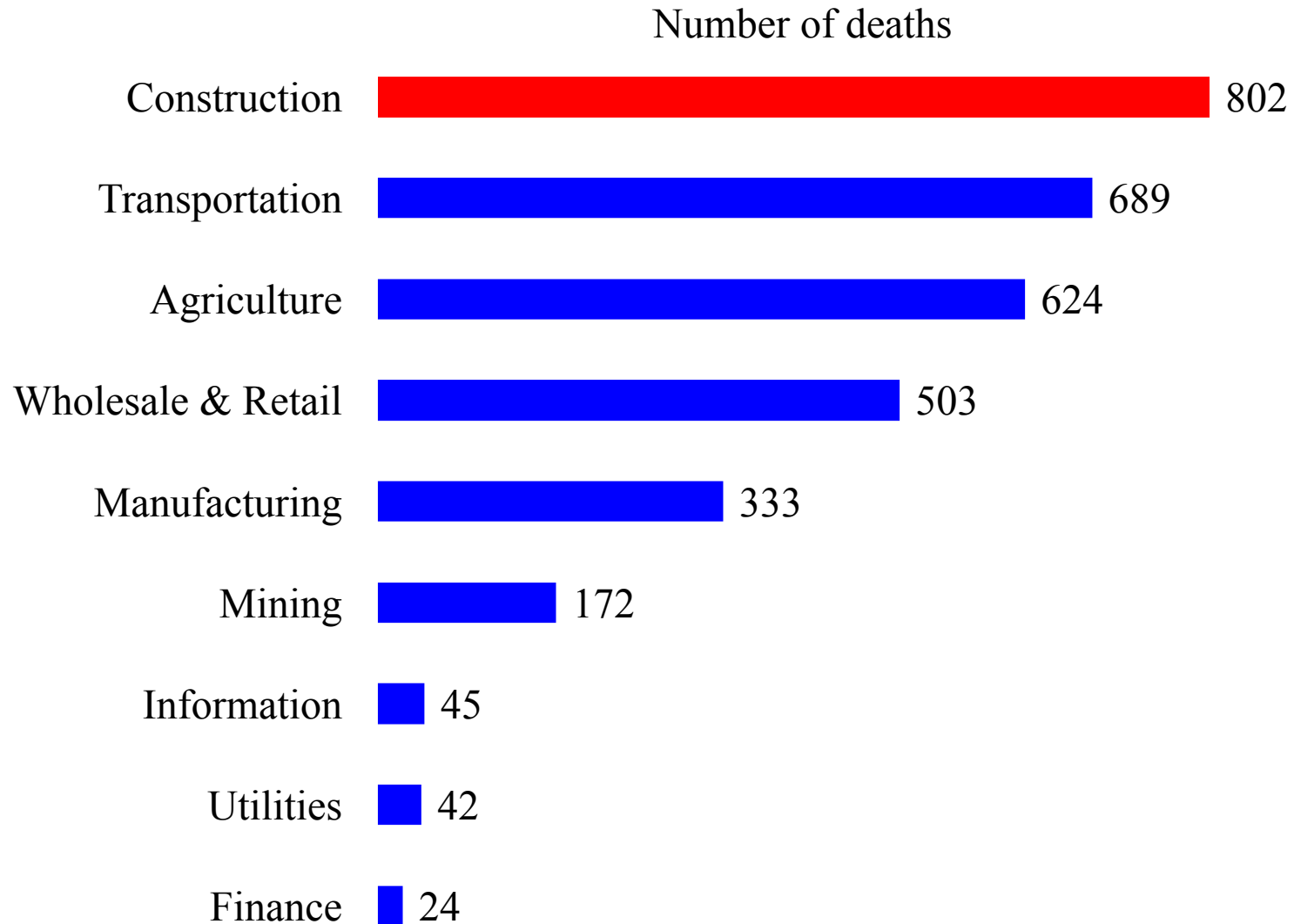
A Leader in... *Risk*

Construction accounts for **7-8%** of all employment

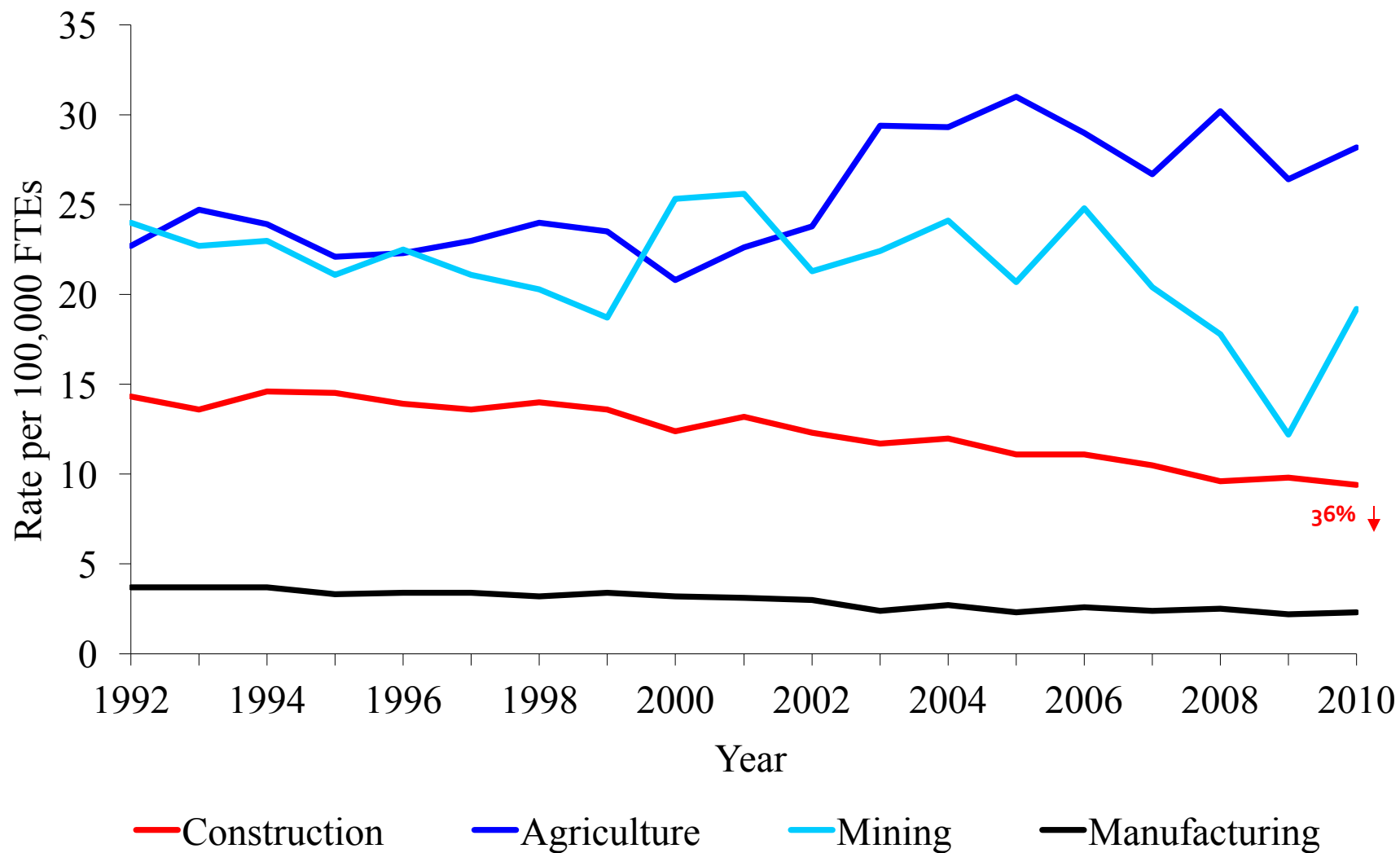
Construction accounts for

- ***20%** of all occupational injuries and fatalities*
- ***1/3rd** of all occupational pulmonary diseases*
- ***50%** of all occupational cancers and at least **1/3rd** of all lung diseases*

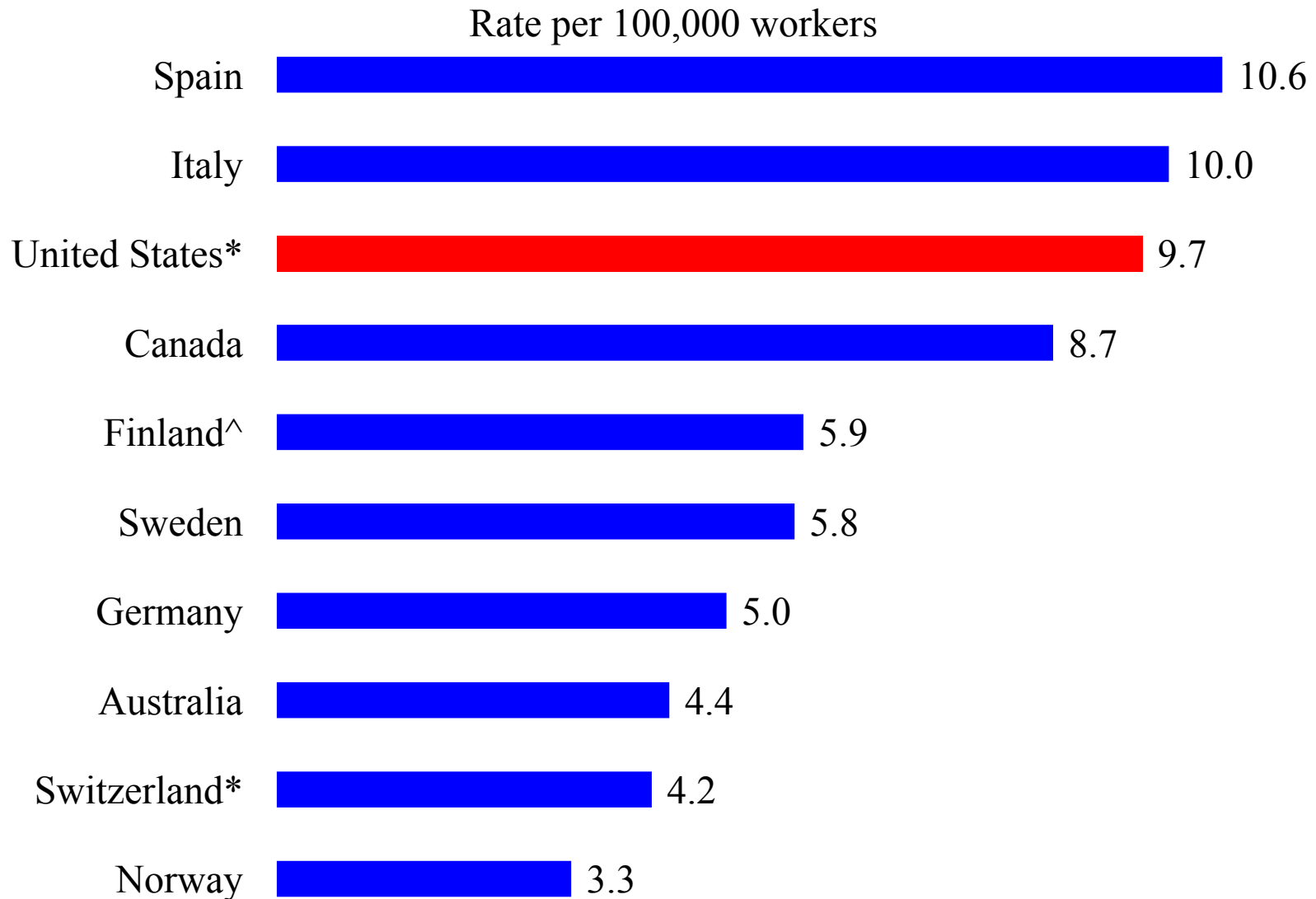
Number of fatalities, by major industry, 2010 (All employment)



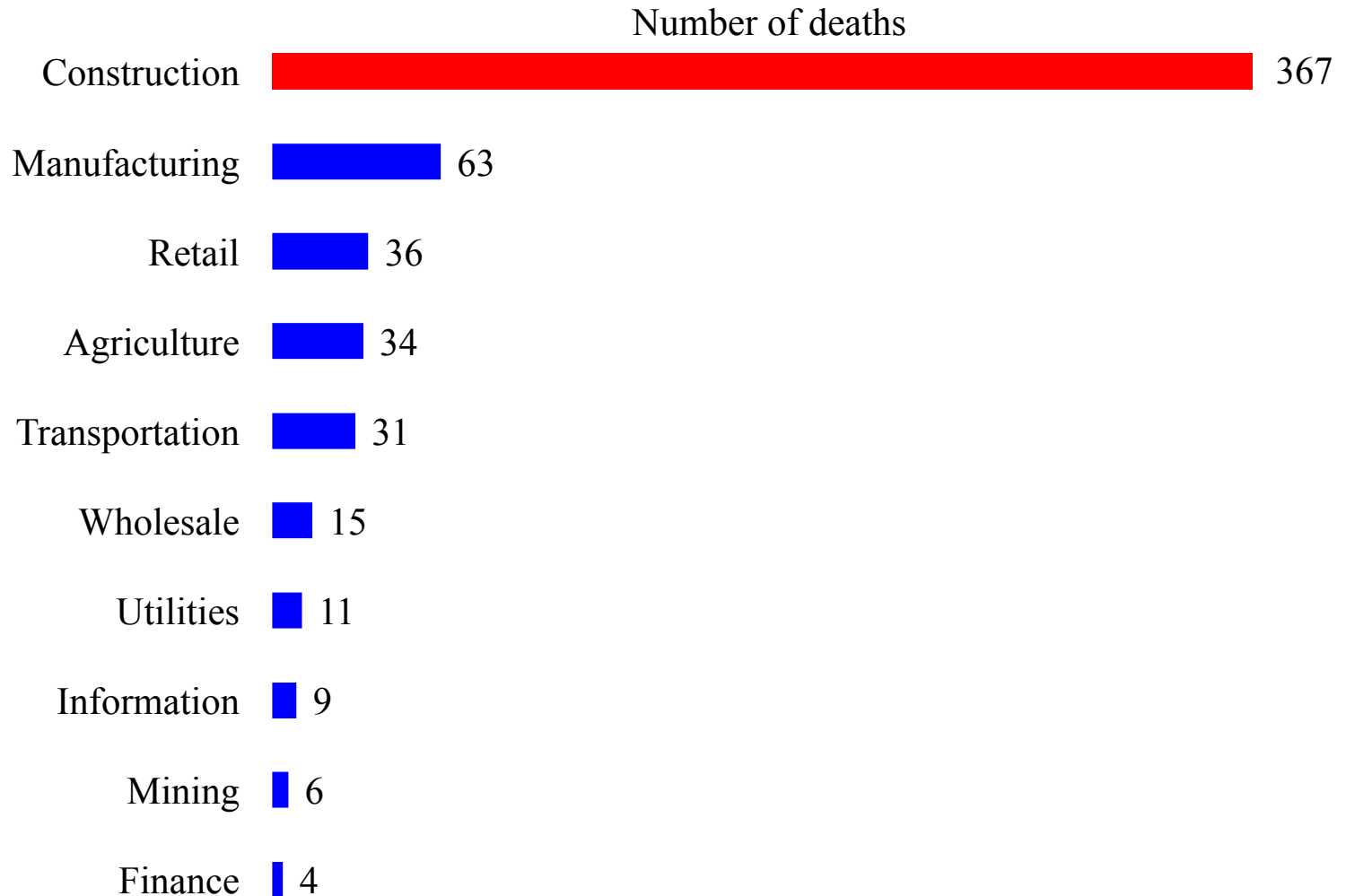
Rate of fatalities, selected industries, 1992-2010 (All employment)



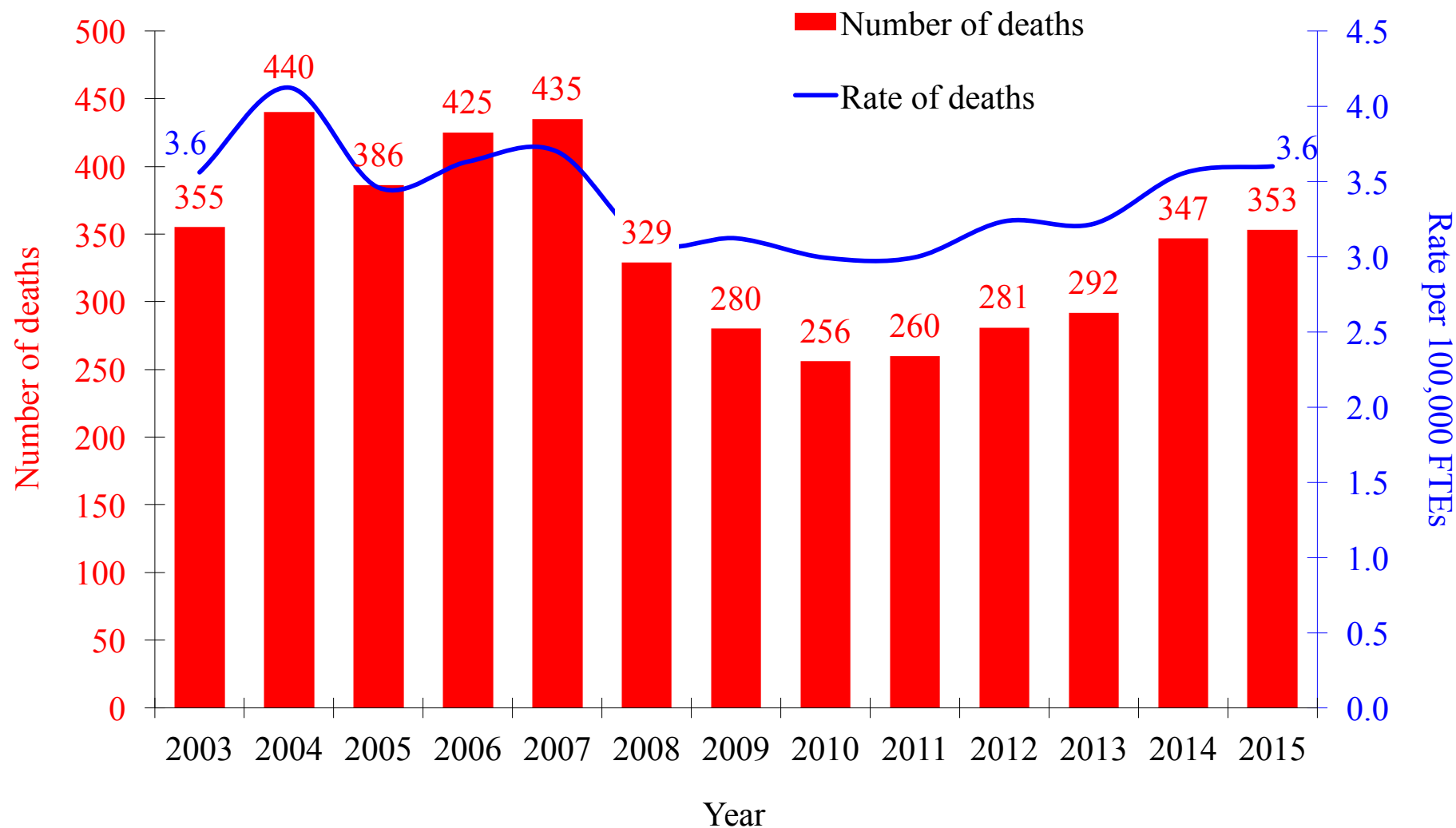
Rate of fatalities in construction, selected countries, 2008



3. Number of fatal fall injuries by major industry, 2015 (All employment)



Number and rate of fatal falls to a lower level in construction, 2003-2015 (All employment)



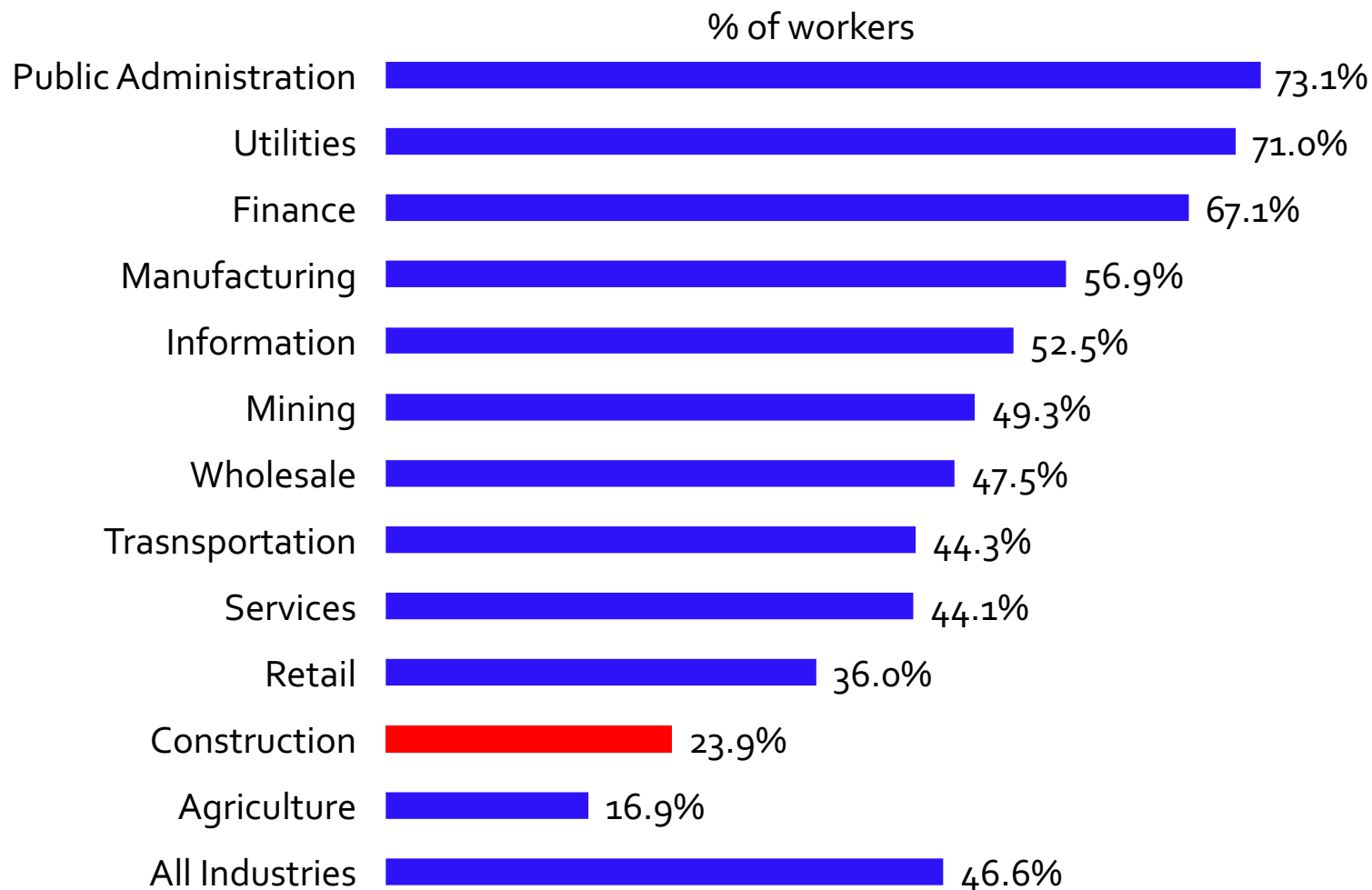
Note: In 2011, the CFOI switched to OIICS version 2.01 which categorizes slips, trips, and falls together. In previous years, slips and trips were categorized elsewhere.
Source: U.S. Bureau of Labor Statistics, 2003-2015 Census of Fatal Occupational Injuries. Numbers were from the online CFOI database. Employment data were from the Current Population Survey. Calculations by the authors.

SIZE OF EMPLOYER AND OSH PRACTICES, USA

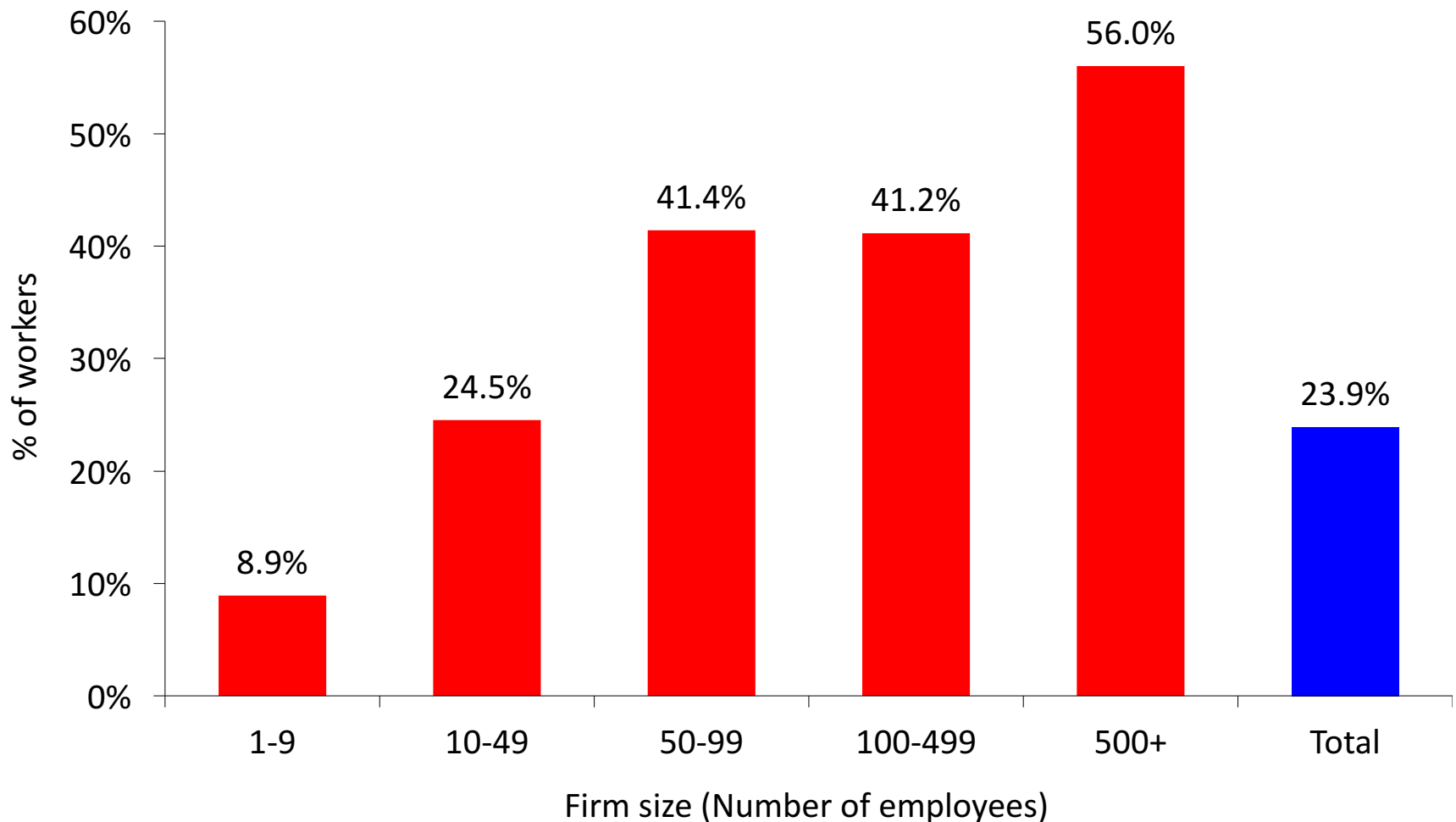
Part 3

**Data from CPWR/Dodge Data & Analytics,
2012 and 2015 Construction Safety
Management Surveys**

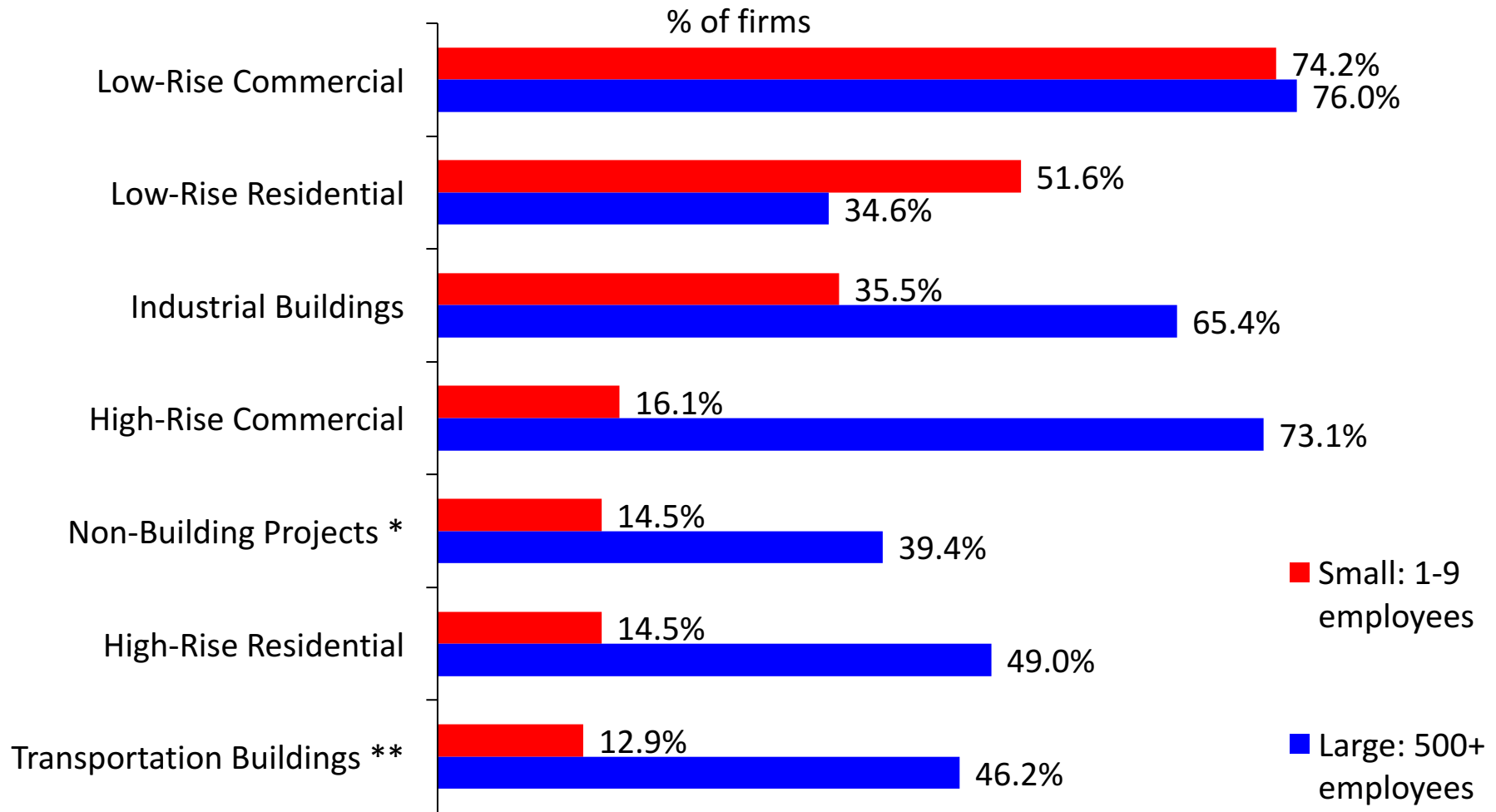
Health promotion programs were available at work, by major industry, 2015 (Wage-and-salary workers)



Health promotion programs were available at work, by construction firm size, 2015 (Wage-and-salary workers)



Type of projects worked on in the last three years, small vs. large firms, average of 2012 and 2015

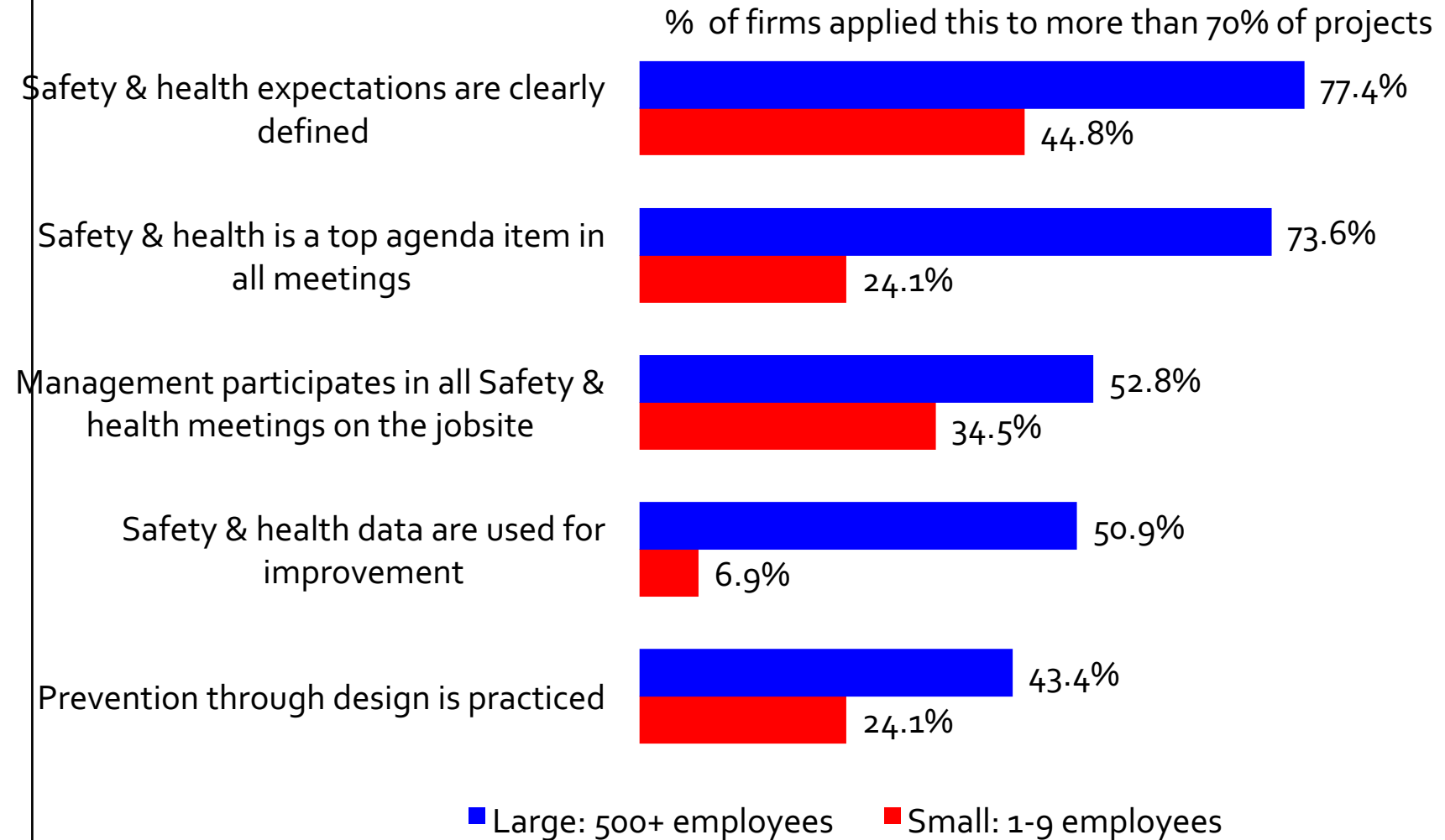


* Highway, street, and bridge; water and sewer; oil and gas pipeline; etc.

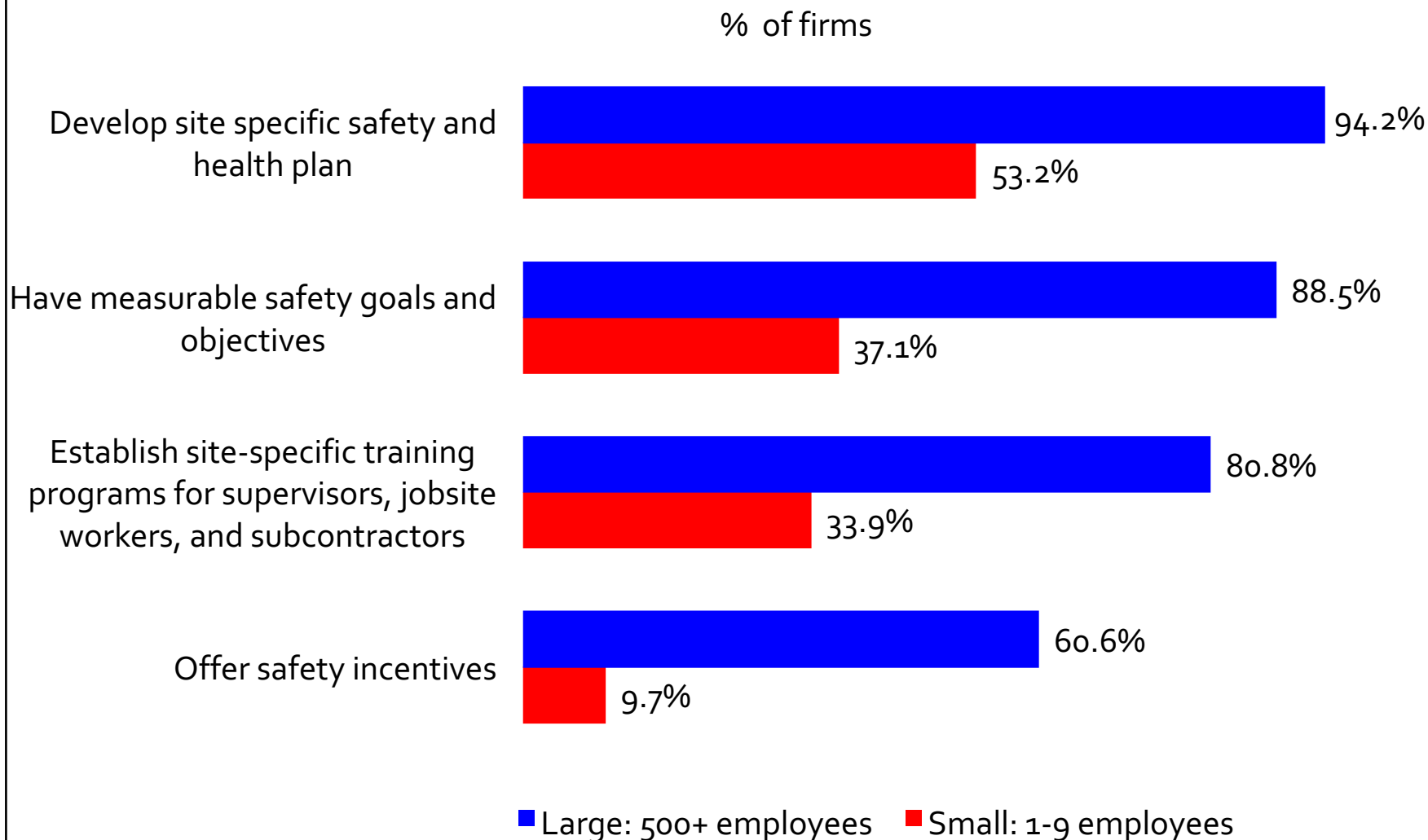
** Airports, ports, train stations, etc.

Source: Dodge Data & Analytics, 2012 and 2015 Construction Safety Management Survey. Calculations by the authors.

Management commitment to safety and health, small versus large firms, 2015

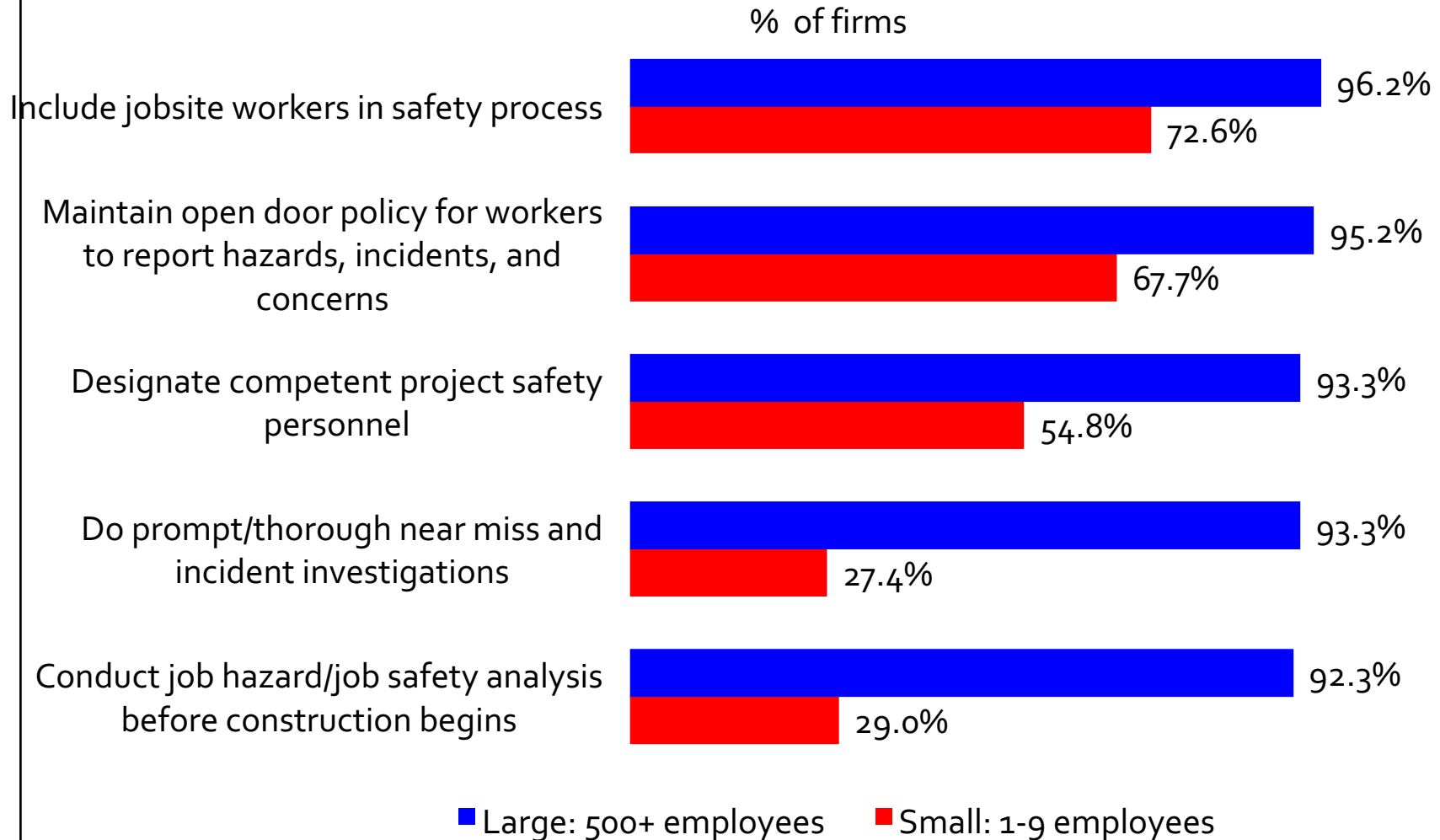


Safety policies, small versus large firms, average of 2012 and 2015



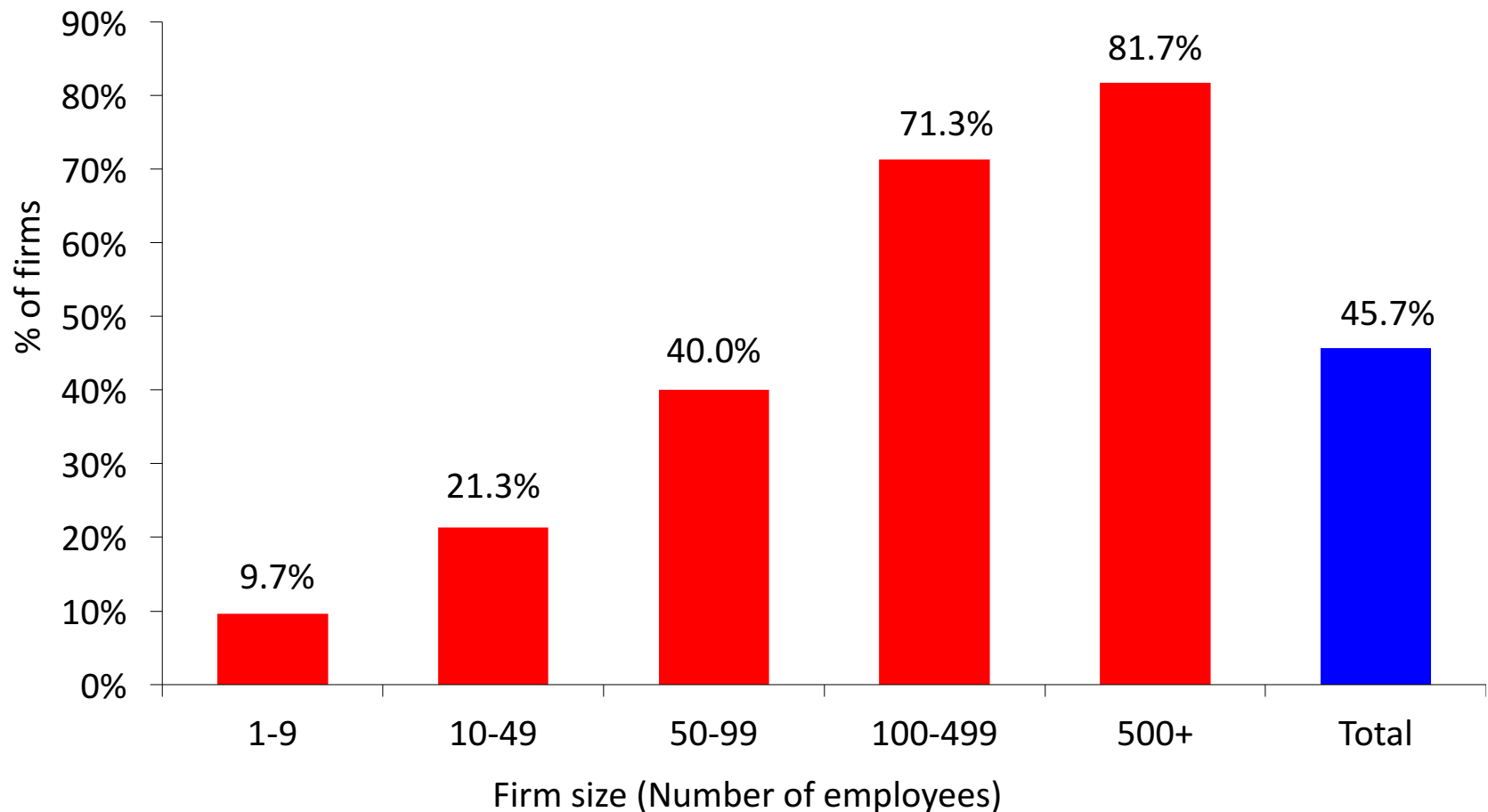
Source: Dodge Data & Analytics, 2012 and 2015 Construction Safety Management Survey. Calculations by the authors.

Organizational safety practices, small versus large firms, average of 2012 and 2015



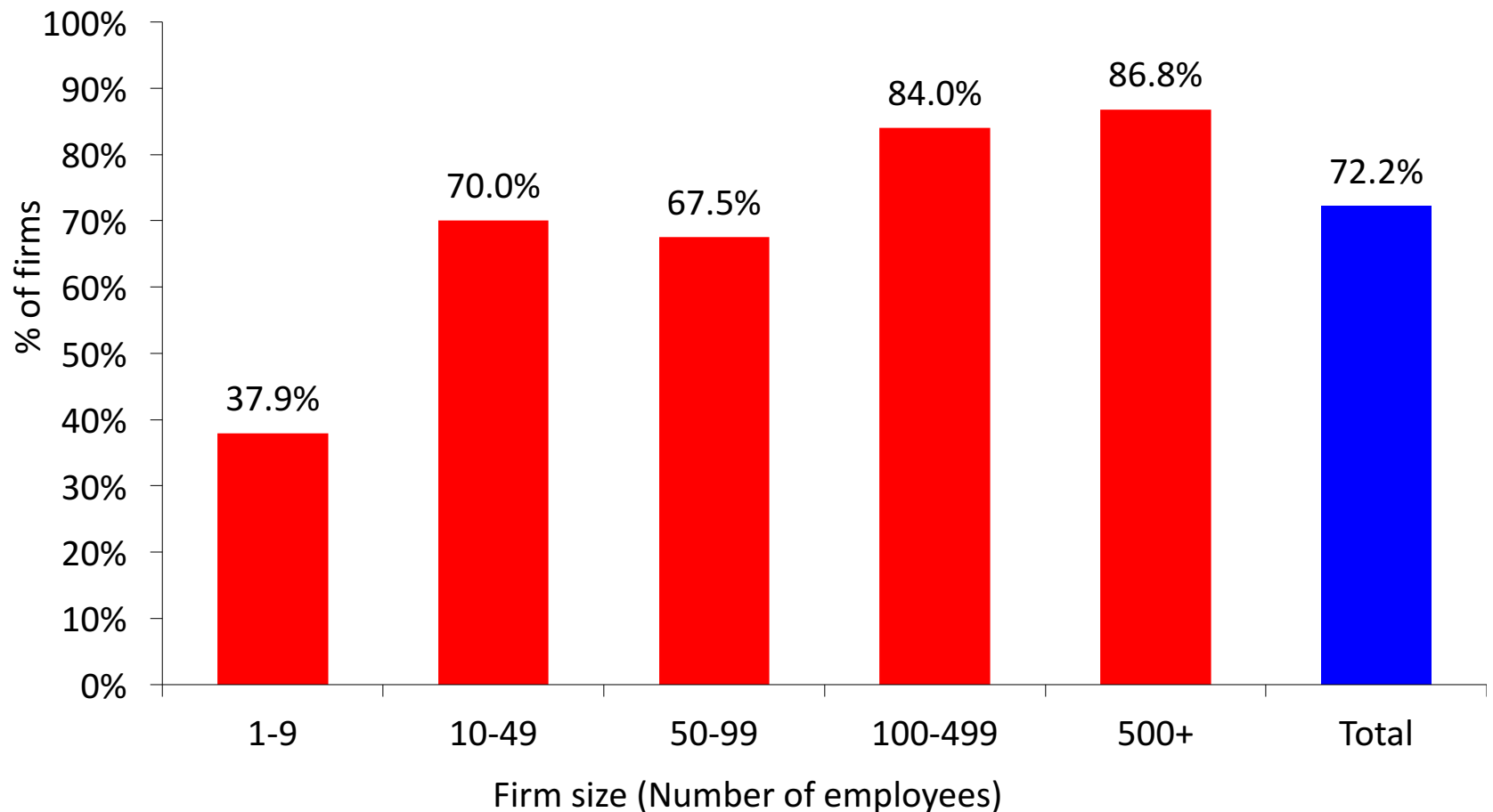
Source: Dodge Data & Analytics, 2012 and 2015 Construction Safety Management Survey. Calculations by the authors.

Percentage of firms with five organizational safety practices by firm size



Source: Dodge Data & Analytics, 2012 and 2015 Construction Safety Management Survey. Calculations by the authors.

Safety practices involving equipment and protection by firm size, 2015



Source: Dodge Data & Analytics, 2015 Construction Safety Management Survey. Calculations by the authors.

WAY FORWARD

HOW TO CAUSE SAFETY

Part 4

VISION ZERO 

Safety.Health.Wellbeing.

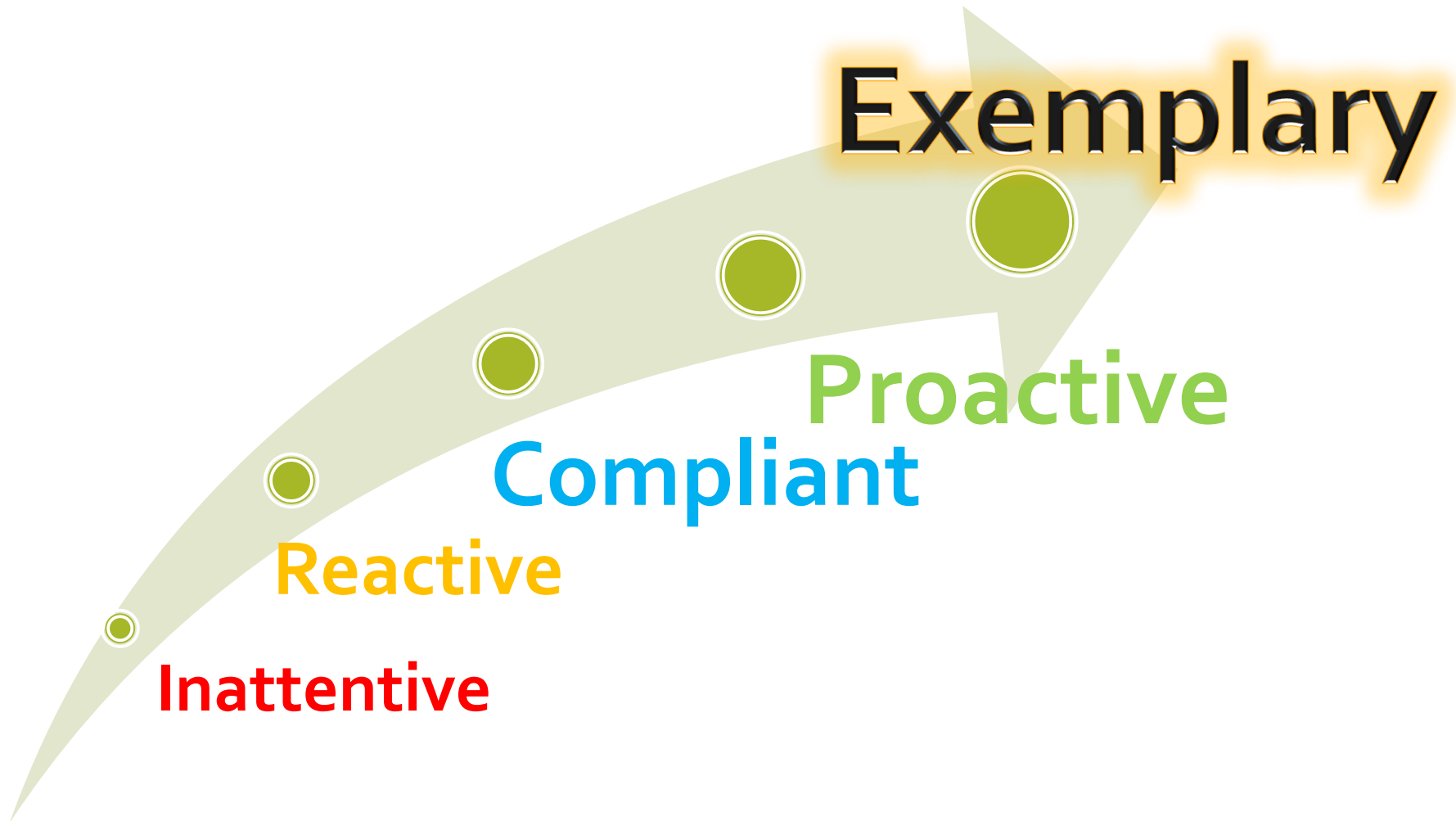
CPWR AND NIOSH HAVE DEVELOPED GUIDANCE FOR STRENGTHENING JOBSITE SAFETY CLIMATE



Strengthening Jobsite Safety Climate, 2014

<http://www.elcosh.org>

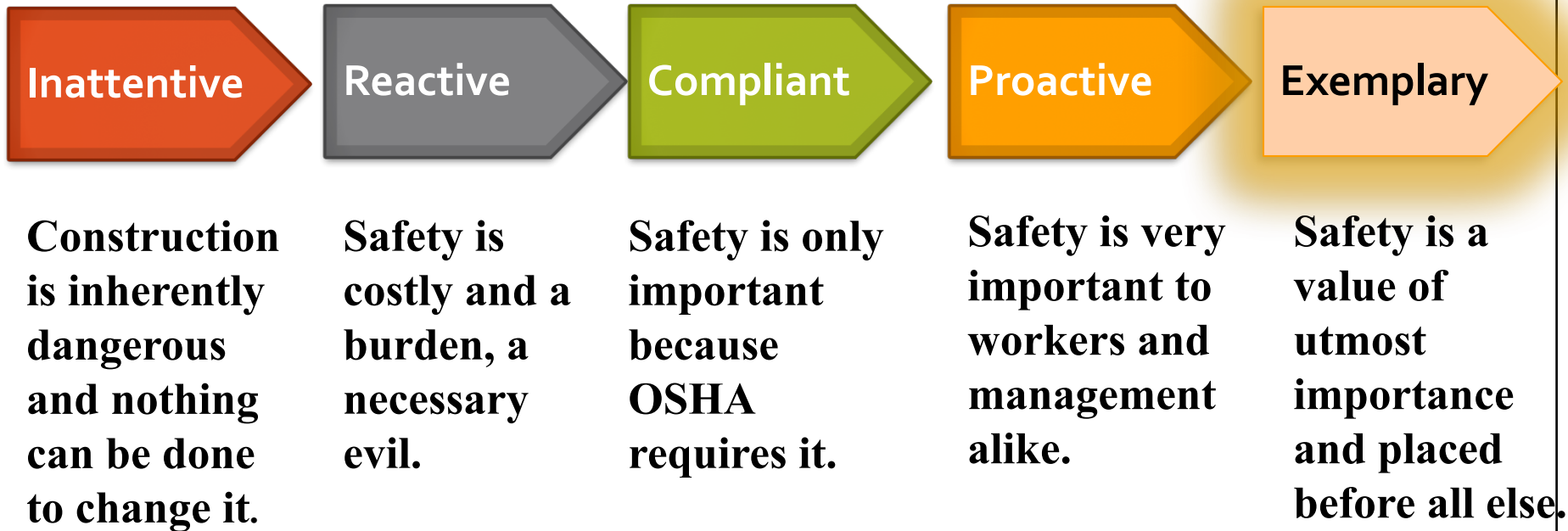
Companies can check where they are on the path to an exemplary safety climate



There are 8 leading indicators to check

1. **Demonstrating Management Commitment**
2. **Aligning and Integrating Safety as a Value**
3. **Ensuring Accountability at All Levels**
4. **Improving Supervisory Leadership**
5. **Empowering and Involving Workers**
6. **Improving Communication**
7. **Training at All Levels**
8. **Encouraging Owner/Client Involvement**

Example:
How well does your firm
2. Align and Integrate Safety as a Value?



1

Demonstrate Management Commitment

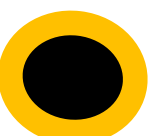
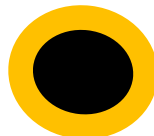


1

Demonstrate Management Commitment

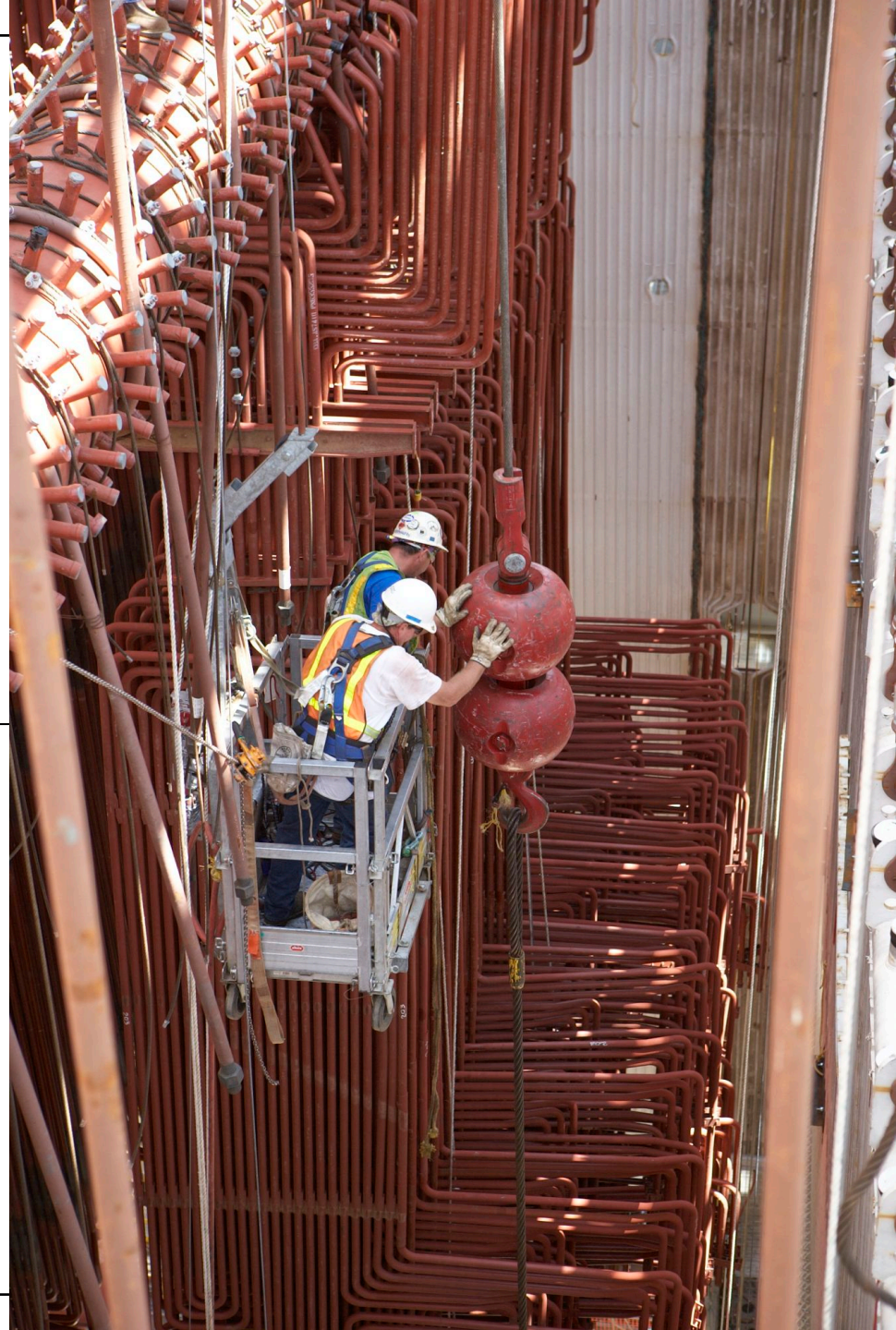
Management:

1. Is present and visible on job sites
2. Practices safe behaviors on job sites
3. Identifies and eliminates or reduces hazards
4. Has a respectful process for corrective action
5. Has a respectful reaction to worker injuries
6. Reviews and analyzes safety policies, procedures & trends



2

Align and Integrate Safety as a Value



2

Align and Integrate Safety as a Value

1. **All employees value safety**
2. **Safety is:**
 - **Discussed at all meetings**
 - **Aligned with other values**
 - **Integrated into all policies & procedures**
3. **Leading safety indicators are used**
4. **Adequate resources are allocated for safety program**

3

Ensure
Accountability
At All Levels



3

Ensure Accountability At All Levels

- 1. A system of safety accountability is created for:**
 - Workers
 - Managers and supervisors
 - Project owners
- 2. Policies setting safety goals, roles and responsibilities for a positive jobsite safety climate are established**
- 3. An incentive structure that promotes and rewards safety processes not just outcomes is developed**

4

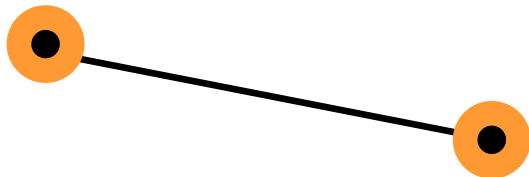
Improve
Supervisory
Leadership



4

Improve Site Safety Leadership

1. Supervisors and foremen share a vision and a commitment to safety
2. Supervisor safety leadership is supported with training
3. Leaders are expected to lead by example, coach, and motivate others when it comes to safety



5

Empower and Involve
Workers



5

Empower and Involve Workers

1. Workers are empowered to invest in safety for themselves and fellow coworkers
2. Worker input is sought on hazard reduction and safety improvement
3. Joint worker-management committees are relied upon to address safety and health concerns




6

Improve
Communication

6

Improve Communication

1. Open lines of communication between employees and all levels of management are established and maintained
2. All employees and managers receive safety trend reports
3. Process for communicating safety messages across entire organization is robust



7 Train at All Levels

7 Train at All Levels

1. Being competent in ones trade is a cornerstone of safety
2. Training is tailored to specific roles and responsibilities at each level of the organization and each job task
3. Safety training for workers, supervisors, and managers is ongoing
4. Workers have OSHA-10 certificates and supervisors have OSHA-30 plus the STS certification
5. Formal and informal assessments are conducted of training needs
6. Training knowledge and certificates are verified for all employees and contractors

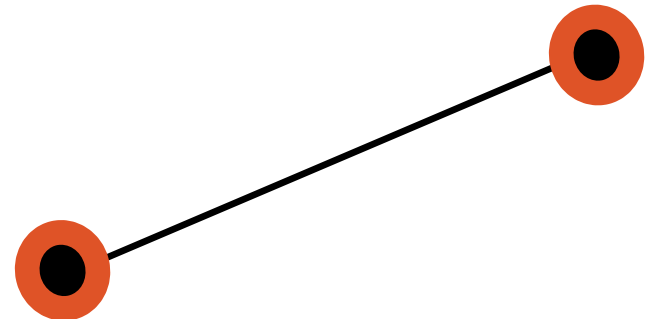
8 ENCOURAGE OWNER AND CLIENT INVOLVEMENT



8

Encourage Owner and Client Involvement

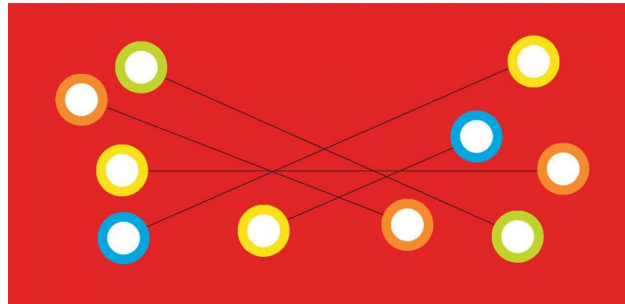
1. Owners are visible on the jobsite
2. Contractors are held accountable for safety
3. Safety is a priority when selecting contractors
4. Prevention through Design (PtD) principles are used to prevent jobsite hazards
5. Incentives are aligned with safety



CPWR TOOLS

Worksheets and a Rating Tool to Help You
Strengthen Jobsite Safety Climate

S-CAT



CPWR
THE CENTER FOR CONSTRUCTION
RESEARCH AND TRAINING

JUNE 2016

Now online at
<http://safetyclimateassessment.org/>



<https://www.cpwr.com/foundations-safety-leadership-fsl>

IN GOOD HANDS

Part 5

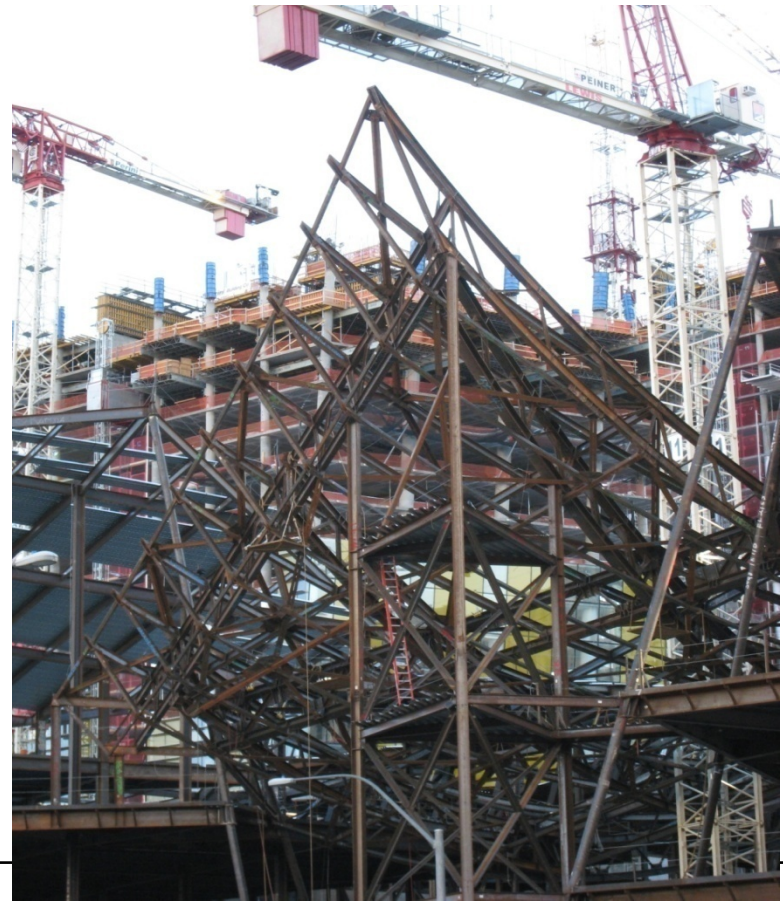
Systemic Causes of Risk

Las Vegas City Center Project



8 Workers Killed

- Lack of oversight by owners
- Schedule over safety
- Lack of coordination
- Missing safety culture
- OSHA derelict in its duties



Fatality Rate on City Center Project (2008-10) About the same as for Empire State Building (1929-30)

- City Center: 5,000 workers/8 deaths
- City Center contractors threw caution to the wind
- 80 years of lessons learned were ignored
- Empire State Bldg: 3,500 workers/5 deaths



US Nuclear Industry Zero Tolerance for Risk



Vogtle 3 and 4 construction site

April 2017

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OII Data, 2009

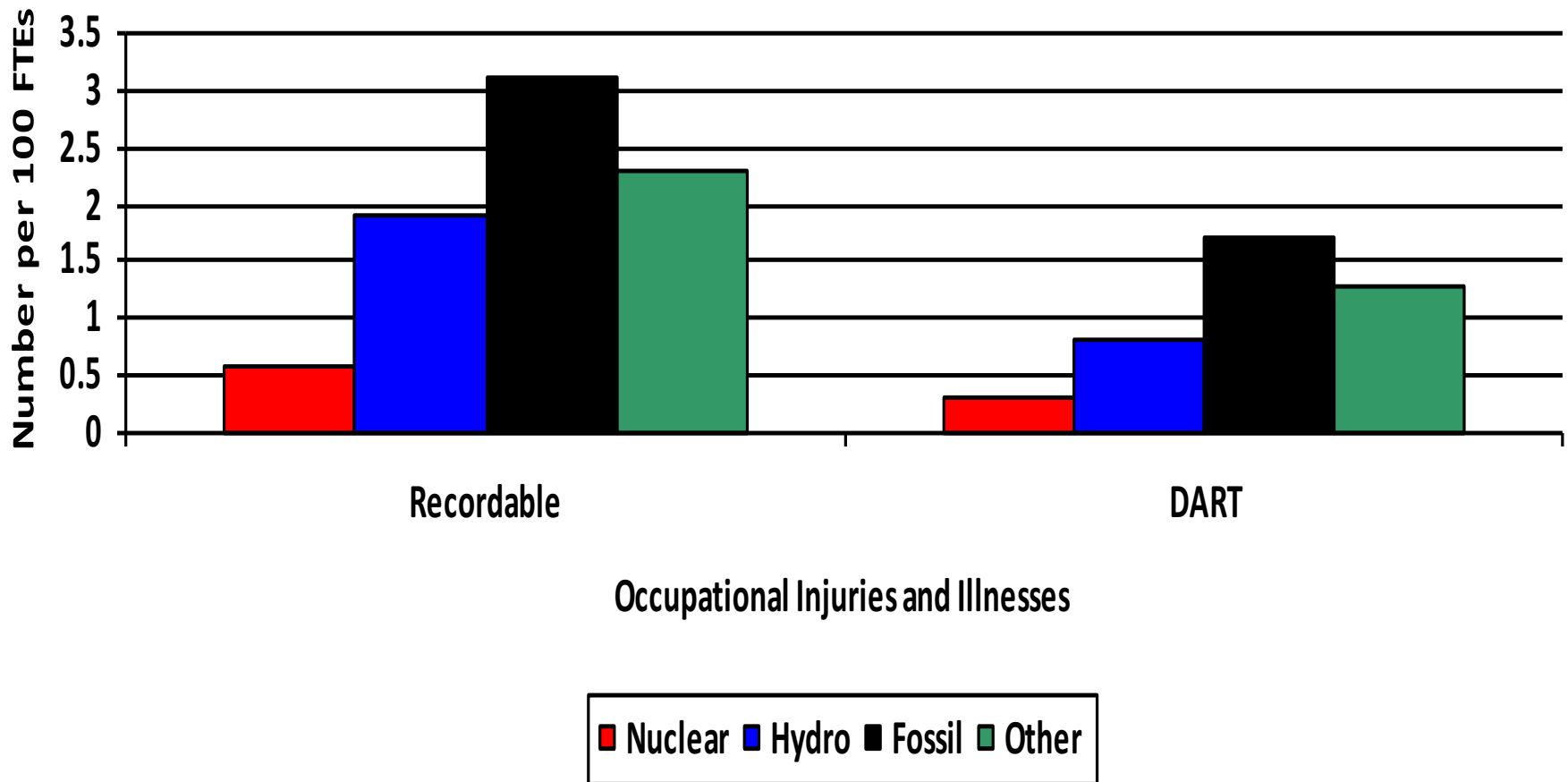


Table 8.1. Rates of Reportable Injuries and Illnesses for Select Industries, 2009

Industry	NAICS	Injury and Illness Rates**	
		Recordable	DART
Nuclear Facilities	221113	0.6	0.3
Computer Storage Device Mfg	334112	0.8	0.2
Finance and Insurance	52	0.8	0.2
Pharmaceutical Manufacturing	3254	2.0	1.1
Chemical Manufacturing	325	2.3	1.4
Aerospace Manufacturing	3364	3.3	1.8
All Manufacturing	31-32	4.3	2.3
Hospitals	6221	7.3	2.8
Steel Products Manufacturing	3312	7.6	3.5
<i>Average for All Private Industry</i>	-	3.6	1.8

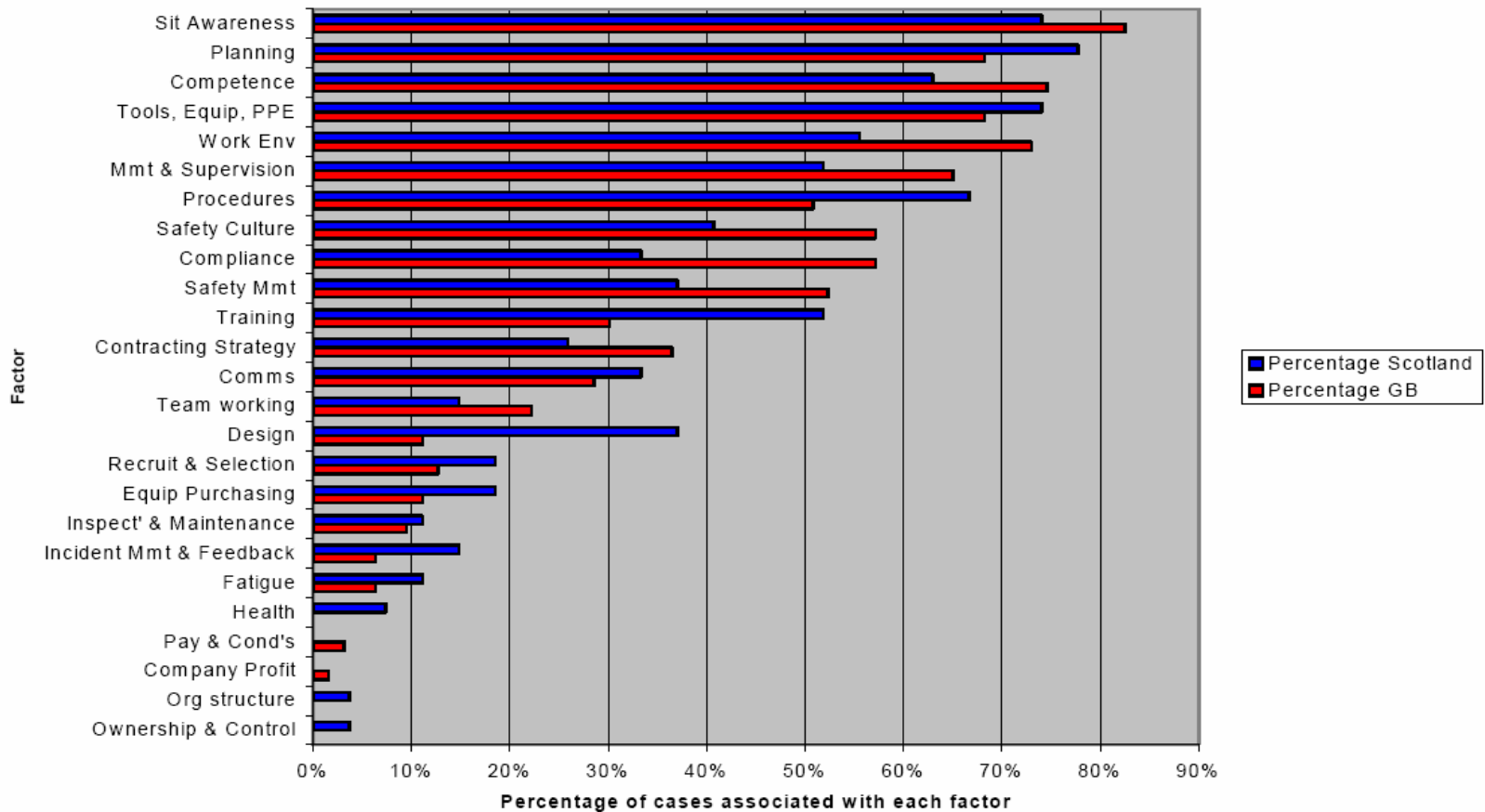
**Number per 100 FTE workers in industry

Table 8.3: Annual Number of Fatal Occupational Injuries by Utility Sector, 2003-2008

Year	Number of Fatal Injuries Reported				
	Hydro	Fossil	Nuclear	Renewable	Total
2003	1	5	0	2	8
2004	2	9	0	1	12
2005	5	4	0	2	11
2006	8	6	0	0	14
2007	2	5	0	0	7
2008	2	3	0	0	5
Total	20	32	0	5	57

One Death is too Many,
Revitalization of COSH in the UK
2000-Today

Causal Factors from 90 Construction Cases, UK



Source: HSE. Underlying causes of construction fatal accidents. 2009.

Applying Knowledge

Use of large public construction projects to exemplify safety

Heathrow Terminal 5

London Olympics Delivery Authority

Cross Rails

Taking the knowledge gained and applying the to SMEs


GOING BEYOND GOLD

Olympic Delivery Authority, London



Thanks to Paul Gordon, British Safety Council

ODA: Three Principal Objectives

- **Best possible safety**
 - **Small business set-aside**
 - **Apprenticeship set-aside**
- 
- To stimulate development
in East London

The Safest Games Ever

- 40,000 workers
- No fatalities
- 103 Reportable injuries. ***None severe***
- Reportable injury rate=0.15/100FTEs.
- **A model for owner-controlled safety performance and safety culture**



QUESTIONS?

The background of the slide is a photograph of two large construction cranes silhouetted against a bright, orange-hued sunset sky. The sun is low on the horizon, creating a strong glow and lens flare. The cranes are positioned horizontally across the middle of the frame, with their lattice structures clearly visible. The overall tone is warm and dramatic.

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