Fatal Falls Among Massachusetts Construction Workers

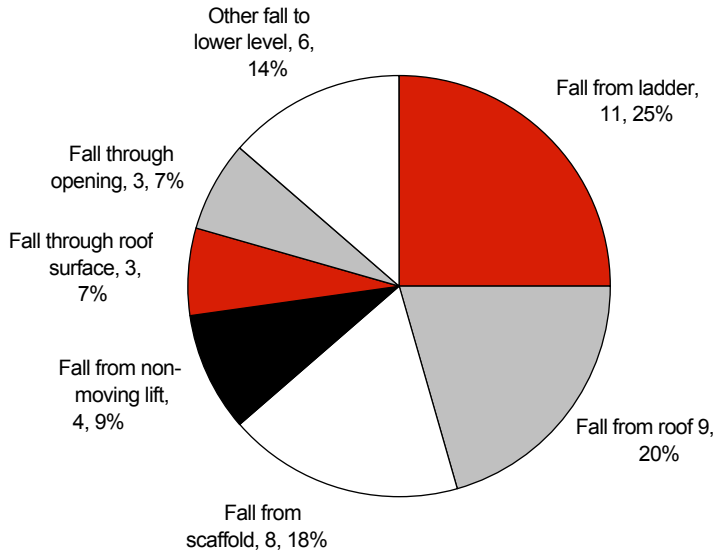
Occupational Health Surveillance Program • Massachusetts Department of Public Health • April 2012

Construction workers create the structures that shape our lives. They build our homes and schools, repair our roads and bridges, create office parks, supermarkets, hospitals, sports arenas… And they are at high risk of being fatally injured on the job. In Massachusetts over the last five years, 78 construction workers were fatally injured at work – more workers than in any other industry. Over half of these workers (44 of 78) fell to their deaths. The rate of fatal falls among construction workers was more than nine times the average rate for all workers in the state (4.9 versus 0.5 deaths per 100,000 full-time workers). This special topic report focuses on fatal falls to a lower level in construction.

Falls were the leading cause of death among construction workers.

- During 2007-2011, an average of nine construction workers fell to their deaths each year. Falls to a lower level were the leading cause of death among construction workers, accounting for more than half of all construction worker deaths (56%, 44 of 78).
- Of the 44 fatal falls to a lower level in construction workers, more than half occurred at residential sites (59%, N=26).
- The rate of fatal falls to lower levels among construction workers (4.9 deaths per 100,00 full-time equivalent workers) – was about 10 times higher than the overall rate for all industry sectors (0.5 deaths per 100,000 workers).
- The greatest number of fatal construction falls were from ladders (25%; N=11), roofs (20%, N=9), and scaffolds (18%, N=8). Four workers (9%) fell from vehicle mounted work platforms or other lifts. Falls through the roof surface or an unguarded opening each accounted for an additional three deaths (7% each). (Chart 1). Of the 26 deaths at residential sites, ten were from ladder falls, eight from roofs, and five from scaffolds.

Chart 1. Types of Fatal Falls to a Lower Level in Construction Massachusetts, 2007-2011 (N=44)



Carpenters, roofers, laborers, and construction contractors had the highest number of fatal falls to a lower level.

- Carpenters (36%, 16), roofers (11%, 5), laborers (11%, 5), and contractors (11%, 5) accounted for the greatest number of fatal falls to a lower level among workers in the Construction industry (Table 1).

- Whereas falls accounted for 24% of all fatal occupational injuries in the state, they accounted for most of the deaths among carpenters and steel workers (80% or higher) and the majority of deaths among roofers, laborers, and painters (Table 1).

- All carpenters who suffered a fatal injury at residential construction sites were hurt in a fall. For painters and roofers working at residential sites, three-quarters of all fatal injuries were from falls.

Table 1. Number and Percent of Fatal Falls to a Lower Level in the Construction Industry *by Select Occupations*, Massachusetts, 2007–2011

Occupation	Total Number of All Fatal Injuries	Number of All Fatal Falls	% of All Fatal Injuries Due to Falls	Number of Fatal Falls at Residential Sites
Carpenters	18	16	89	9
Roofers	7	5	71	3
Construction laborers	8	5	63	5
Construction contractors	10	5	50	4
Structural iron and steel workers	5	4	80	0
Painters	7	4	57	3
Electricians, Masons, and other construction workers	23	5	22	2
All Construction occupations	78	44	56	26
All Occupations	311	76	24	

- Concurrent with findings by occupation, the residential building construction industry sub-sector accounted for more fatal falls to a lower level (36%, 16) than any other sub-sector within the Construction industry. Roofing, siding and sheet metal sub-sectors followed with 12 (27%) of the fatal falls in construction (Table 2).

- At residential construction sites, all fatal injuries in the residential building construction industry sub-sector were from falls, and in the roofing, siding and sheet metal industry, six of seven deaths were from falls.

Table 2. Distribution of Fatal Falls to a Lower Level in the Construction Industry *by Selected Industry Sub-sector*, Massachusetts, 2007–2011

Industry Sub-sector	Number of All Fatal Falls	% of All Fatal Falls in Construction	Number of Fatal Falls at Residential Sites
Specialty Trade Contractors	**26**	**59**	**12**
Foundation, Structure, & Bldg. Exterior Work	16	36	8
- *Roofing, Siding, & Sheet Metal Work*	*12*	27	*6*
- *Masonry or Framing Work*	*2*	5	*1*
- *Structural Steel Erection & Precast Concrete*	*2*	5	*1*
Building Finishing Work (Carpentry, Painting, Wall covering)	4	9	3
Building Equip. Work (Plumbing/HVAC, Electrical)	3	7	1
Other Specialty Trade Work	3	7	
Other Construction Sub-sectors	**18**	**41**	**14**
Residential Building Construction	16	36	14
All Construction	44	100	26

Hispanic workers in the construction industry had high rates of fatal falls to a lower level.

- Ten of the 44 workers in the construction industry who fell to their deaths were Hispanic. The rate of fatal falls among Hispanic construction workers (16.6 deaths per 100,000 full time equivalent workers) was more than four times the rate among White non-Hispanic construction workers (4.0 deaths per 100,000 full time equivalent workers). Although this difference was of borderline statistical significance, it is consistent with a high rate of fatal falls among Hispanic construction workers reported elsewhere.[1]

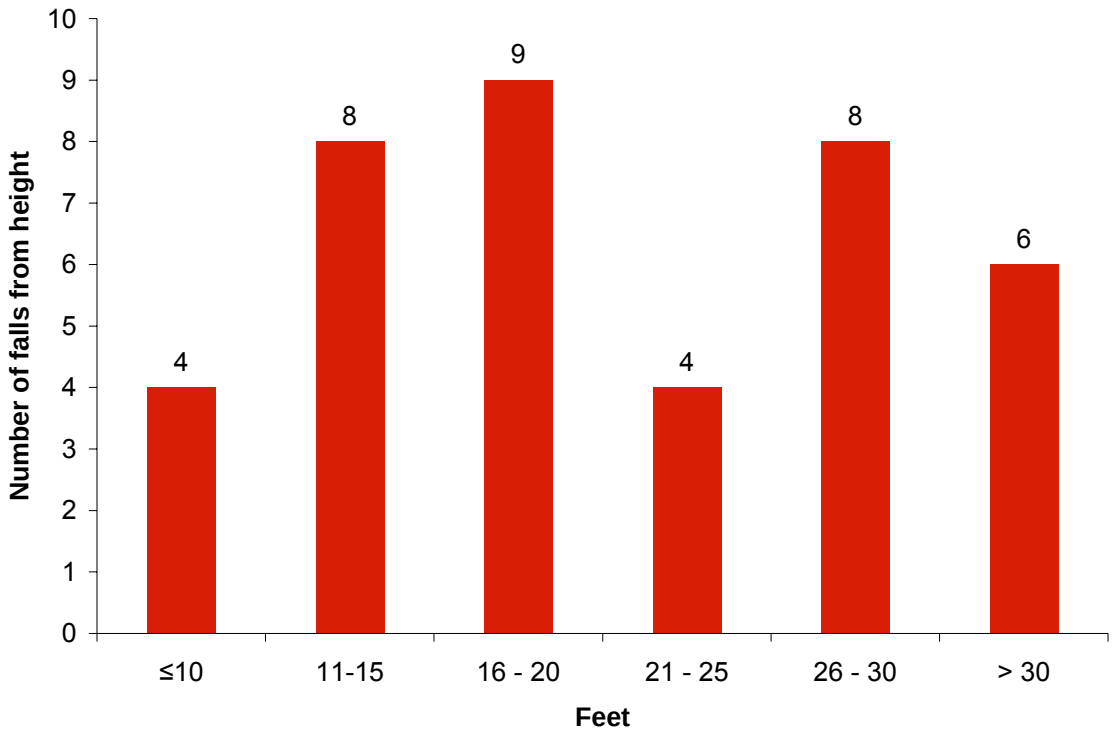
A majority of fatal falls to lower levels in the construction industry were from heights of 25 feet or less.

- Height information was available for 39 out of 44 fatal falls to lower levels in the Construction industry. The heights ranged from six feet to over 1,700 feet. Of these 39 fatal falls, 64% (25 fatalities) were from heights of 25 feet or less (Chart 2), with 12 fatal falls (31%) from heights of 15 feet or lower. Six falls (15%) were from heights of greater than 30 feet.

- At residential sites, the average height of fall was 19 feet. At non-residential sites, the average height of fall was 30 feet (this excludes the 1,700+ foot tower fall).

[1] Personal communication with S. Dong, Center for Construction Research and Training (CPWR).

Chart 2. Fatal Falls to a Lower Level in the Construction Industry by Height of Fall Massachusetts, 2007-2011 (N=39)

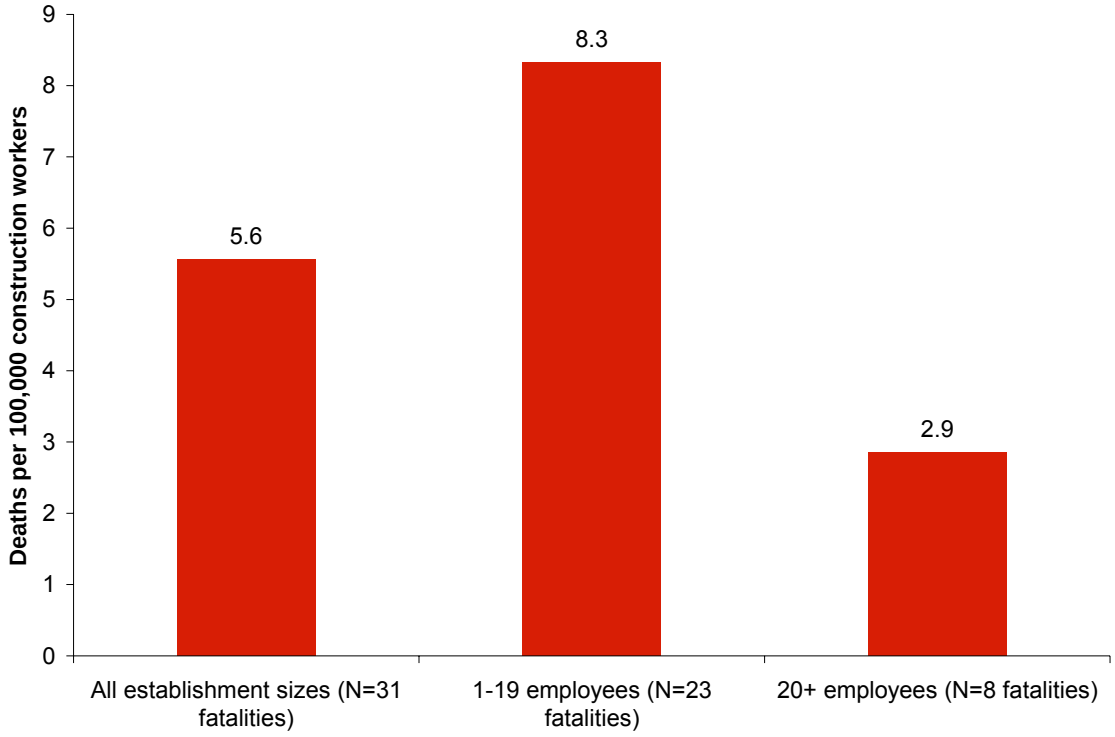


NOTE: Height information was not available for five fatal falls to lower levels in the Construction industry sector.

Fatal falls in the construction industry were concentrated in small establishments.

- Thirty-four of the 44 fatal falls to lower levels in the Construction sector (77%) involved workers employed in establishments with 10 or fewer employees. The fatal fall rate for construction establishments with 19 or fewer employees was somewhat higher (8.3 deaths per 100,000 workers) than the rate for all construction establishment sizes combined (5.6 deaths per 100,000 workers), but this difference was not statistically significant (Chart 3).
- Thirteen of the 44 fatal falls were self-employed workers (30%).
- At residential construction sites, 88% (23) of the fatal fall victims were employed by small contractors with 10 or fewer employees. Eleven of these were self-employed.
- Notably, establishments with fewer than 11 employees are not routinely inspected by OSHA unless a fatality occurs.

Chart 3. Rate of Fatal Falls to a Lower Level in Construction by Establishment Size (number of employees) Massachusetts, 2007-2011



NOTE: Rates by establishment size calculated using 2007-2010 Massachusetts employment estimates for the construction industry from the Quarterly Census of Employment & Wages (QCEW): http://stats.bls.gov/cew. These data include all establishments and their employees in Massachusetts subject to state and federal unemployment compensation laws. In computing rates, fatalities among self-employed workers (13 deaths) were excluded in order to maintain consistency with the denominator (employment) data.

Demographic profile of the 44 workers

Male	44
Age (years)	Range 17-75
<30	5
30-39	11
40-49	15
50-59	10
60 and older	3
Average age	43
Race / ethnicity	
White non-Hispanic	31
Hispanic	10
Other	3
Foreign-born	14
South America	5
Central America and Caribbean	4

Preventing falls in construction.

It is not surprising that construction workers are at high risk of falls given the nature of their work. But these falls should not be simply accepted as part of the job. We know how to prevent falls in construction:

- **Plan** ahead to get the job done safely.
- **Provide** the right equipment.
- **Train** everyone to use the equipment safely.

Contractors and construction workers and their unions, as well as builders, equipment designers, homeowners – even architects who design our buildings – have critical roles to play in reducing falls in construction. A nationwide campaign to reduce falls in construction is underway. Log on to the campaign website to learn what you can do to make sure that the workers building our homes get to go home. **www.stopconstructionfalls.com**

Resources

Massachusetts Department of Public Health (MDPH)
Massachusetts Fatality Assessment and Control Evaluation (MA FACE) Project
Fall Prevention Brochures in English, Spanish or Portuguese.

- Ladder safety for residential contractors
- Scaffold safety for residential contractors
- Falls in construction: Myths and facts
- Personal fall arrest systems for residential construction (soon to be available)

Accessible online: www.mass.gov/dph/FACE
Hard copies can be ordered from MDPH: (800) 338-5223; MA.FACE@state.ma.us

Massachusetts Department of Industrial Accidents (MDIA)
Safety Training Grants. Grants are available for providing workplace health and safety training to employees and employers. Any company covered by the Massachusetts Workers' Compensation Insurance Law is eligible to apply for these grants.
www.mass.gov/dia/safety

Massachusetts Department of Labor Standards (DOL)
Safety and Health On-site Consultation Program
Provides free consultation services to help small employers improve their safety and health programs, indentify hazards and train employees.
(617) 969-7177; www.mass.gov/dols

Protección en construcción: The Lawrence Latino Safety Partnership
A federally funded project that provides health and safety leadership training in English and Spanish for construction contractors and supervisors in northeastern Massachusetts.
www.lawrenceworksafe.org

The Center for Construction Research and Training
Construction health and safety materials
www.cpwr.com

National Institute for Occupational Safety and Health (NIOSH)
Construction health and safety resources and materials
www.cdc.gov/niosh/construction

Occupational Safety and Health Administration (OSHA)
Construction health and safety resources and materials
www.osha.gov/doc/index.html

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