Fatalities in Residential Construction

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This is a review of residential fatality information from the Census of Fatal Occupational Injuries of the United States Department of Labor Bureau of Labor Statistics. It provides some demographic information of those that died on residential projects from 2003 to 2006. Statistics are also provided regarding the numbers of fatalities and their related causes.

Key Words: Residential Construction, Fatalities, Safety

Introduction

The Construction Safety and Health Committee of the National Association of Home Builders commissioned a study of the Census of Fatal Occupational Injuries of the United States Department of Labor Bureau of Labor Statistics. The study complied data from a four year period that included information from the 2003 to 2006 reports. This time frame was chosen because industry classifications changed from the Standard Industrial Classification (SIC) System to the North American Industry Classification System (NAICS) in 2003.

The Census of Fatal Occupational Injuries (CFOI) is a Bureau of Labor Statistics' database that contains fatality information from all 50 states and the District of Columbia. The information in the database is gathered from Occupational Safety and Health Administration reports, media accounts, death certificates, and workers compensation reports. To be included in the database an incident must be documented from at least two sources verifying that the fatality was work related. Also fatalities such as self-employed workers, some highway accidents and assaults that are not regulated by the Occupational Safety and Health Administration (OSHA) are included.

Categories

The NAICS statistics are divided into several categories. Categories that were utilized in this study included Non-Residential, Residential, and Multi-family. Records in which the Industry was indicated as new multi-family housing construction or the death occurred at a residential building taller than 40 feet or 3 stories or the fatality narrative included the term condo, apartment, elevator, or high rise. The residential category included incidents in which the listed Industry was residential construction, new single-family housing construction, new housing operative builders, residential remodelers, residential specialty trade contractors, or land subdivision. Incidents in which the death occurred on a residential construction site or the fatality narrative included the term house, home, residence, family, garage, porch, chimney, driveway, or backyard are also included in the residential category. Non-residential fatalities included construction fatalities that the indicated industry was non-residential construction of buildings, non-residential building construction, heavy and civil engineering construction, or non-residential specialty trade contractors or the fatality narrative included the term steel erection, bridge, machine room, parking lot, water tank, silo, elevator, hotel, mill, plant, industrial, quarry, transformer, or hay bale.

From 2003 to 2006 a total of 4777 construction related fatalities are recorded in the CFOI database. This includes 3232 in the non-residential category, 1385 in the residential category, and 160 multi-family fatalities. Broken down by percentage, 68% were non-residential 29% occurred on residential sites and 3% were multi-family related.

Broken down by year as shown in Table 1, the number of non-residential fatalities has fluctuated between 792 to 851 deaths. The trend in the residential category has been increasing each year from 312 in 2003 to 375 fatalities in 2006. Like wise the number of deaths in the multi-family category has increased each year from 27 in 2003 to 54 in 2006.

Table 1

Fatalities by year, 2003- 2006

Category	2003	2004	2005	2006
Non-residential	792	851	792	797
Residential	312	345	353	375
Multi-family	27	38	41	54

The CFOI database category of Industry is used to describe the employer of the fatally injured worker. The 1385 residential industry fatalities have been broken down into two subcategories. Residential construction included fatalities in residential construction, new single-family housing construction, new housing operative builders, and residential remodeling. A separate subcategory identified as specialty trades included fatalities from trade partners such as roofing contractors, electrical contractors, and workers involved in land development activities. Table 2 lists the number the specialty trades in which more than 30 fatalities occurred in the four year period. The list is topped by roofing contractors with 150 fatalities followed by 97 HVAC related deaths.

Table 2

Fatalities in Residential Specialty Trades: More than 30 Fatalities	
150	Roofing Contractors
97	Plumbing, Heating, and Air-Conditioning Contractors
91	Site Preparation Contractors
86	Painting and Wall Covering Contractors
73	Framing Contractors
57	Electrical Contractors
49	Masonry Contractors
48	All Other Special Trade Contractors
41	Finish Carpentry Contractors
37	Poured Concrete Foundation and Structure Contractors
33	Siding Contractors
31	Drywall and Insulation Contractors

The CFOI deaths are also broken down using the occupation of the worker that has died as shown in Table 3. For example, a construction manager working for a roofing contractor, the industry would be listed as roofing contractors, but the occupation would be construction managers. This explains why there were 150 deaths in the industry of 'roofing contractors' but only 113 deaths in the occupational category of 'roofers'.

Table 3

Fatalities by Occupation with 20 or More Fatalities	
984	Total Fatalities
376	Construction Laborers
230	Carpenters
113	Roofers
103	First-Line Supervisors/Managers of Construction Trades and Extraction Workers
93	Construction Managers
84	Painters, Construction and Maintenance
46	Electricians
38	Operating Engineers and Other Construction Equipment Operators
30	Heating, Air Conditioning, and Refrigeration Mechanics and Installers
29	Plumbers, Pipefitters, and Steamfitters
28	Truck Drivers, Heavy and Tractor-Trailer
27	Drywall and Ceiling Tile Installers

Demographics

The CFOI also tracks the ethnic information of the individual. Over this period there were 866 (63%) fatalities belonging to the White category, followed by 392 (28%) Hispanic, 101 (7%) African American, 16 (1%) Asian, and 10 (1%) that are lacking ethic origin data. Compared to data from the US Census Bureau American Community Survey (ACS) in Table 4 there is a disproportionate number of fatalities in the Hispanic category. This may be attributed to the influx of untrained Hispanics into the construction workforce.

Table 4

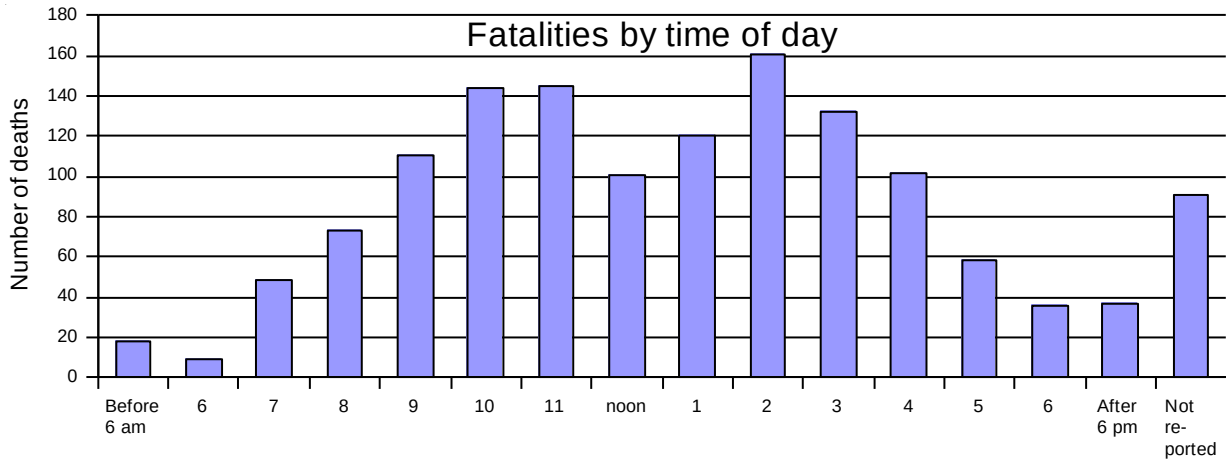
Ethnic Background

	Fatalities	ACS Data*
White	63%	74%
Hispanic	28%	14%
African America	7%	12%
Asian	1%	4%
Not Indicated or Other	1%	6%

*Exceeds 100% due to reporting errors

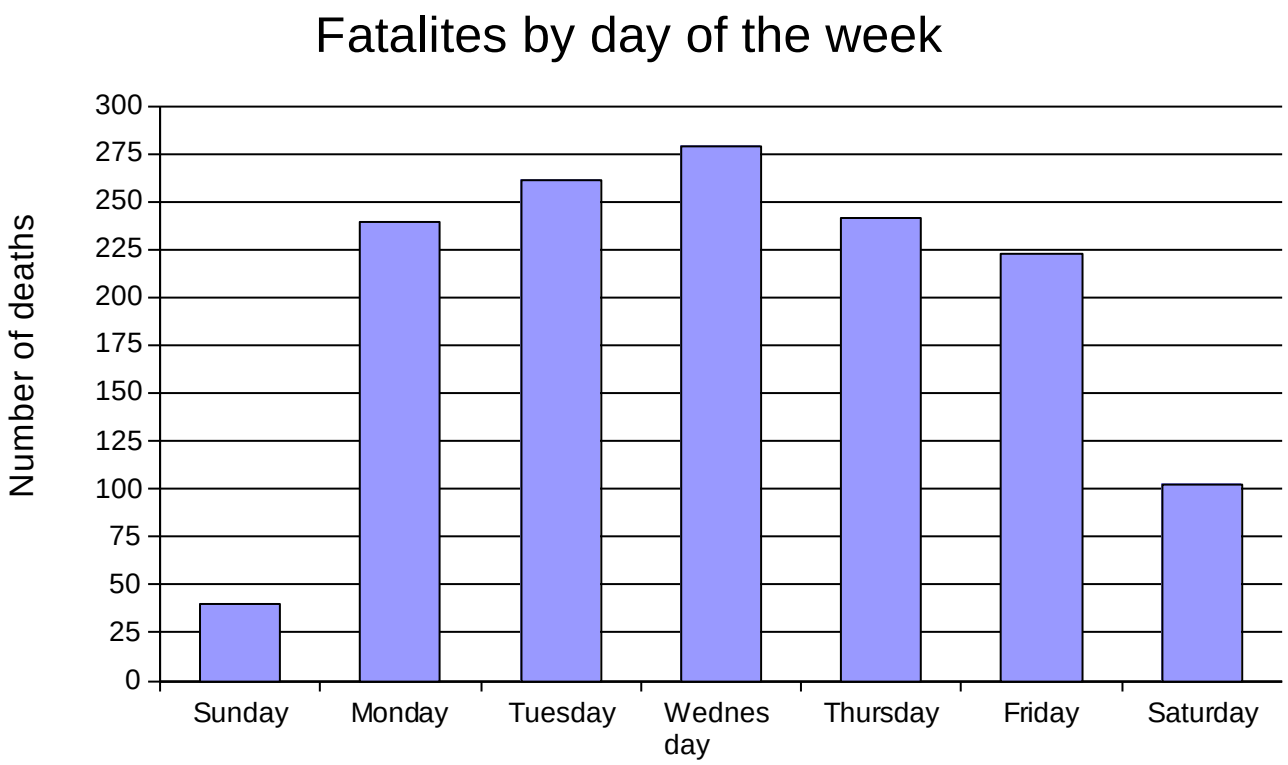
The length of time that the employee has been with the current employer is also part of the CFOI data. The fatality rate is highest (47%) when the employee has been with the current employer for one year or less. The incident rate drops significantly to 12% for those employed 2 years. The rate is about the same (13%) for those with the same employer for 3 to 5 years and decreases to 12% for those in the 5 to 10 year range. The rate does increase slightly to 16% for those with 10 or more years of service. The high incident rate in new employees could be related to the lack of safety training that they have received. The rise in the rate of those with 10 or more years could be related to the fact that average age of construction workers is increasing and that the workers stay with one company for a long time.

The CFOI also reports the time of day (Graph 1) and the day of the week (Graph 2) of the fatality. This data conforms to historical trends observed in the construction industry as a whole. It should be noted



Graph 1

that fatalities occurred outside of the traditional construction work hours and on weekends.



Graph 2

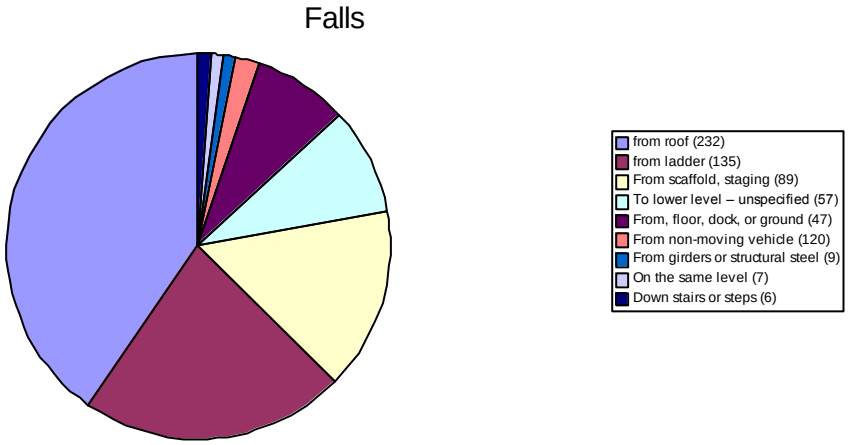
Causes

The cause of the 1385 residential fatalities also follows trends across the entire construction industry as shown in Table 5. This is lead by 602 (43%) falls. 251 (18%) deaths were caused by contact with objects and equipment. This category included excavating and vehicle accidents. 248 (18%) fatalities were caused by exposure to harmful substances and environments that included electrocution caustic substances. It is interesting to note that 199 (14%) are related to vehicle accidents that were both highway and non-highway related. Shootings and suicides were included in the 48 (3%) of the incidents that are caused by assaults or other acts of violence.

Table 5

The main causes of fatal injury were:	
602	Falls
251	Contact with Objects and Equipment
248	Exposure to Harmful Substances and Environments
199	Transportation Accidents
48	Assaults and Violent Acts
34	Fires and Explosions

The 602 falls are further broken down into 10 categories (Graph 3). Not surprisingly 232 (40%) were from roofs. Of these 232 falls 138 (59%) were from the edge of a roof and 17 (7%) were through roof openings such as skylights. 135 (22%) falls were from ladders and 89 (15%) involved falls from scaffolding or staging. Other interesting information about falls is that 52% of the fatalities involved workers that were at least 45 years old and 32 % were foreign born. A little more than half of the deaths were a result of trauma to the head. Also the data showed that August with 66 fatalities was the deadliest month followed by October with 65.



Graph 3

Conclusions

The fatality rate in residential construction has shown a steady increase from 312 deaths in 2003 to 375 fatalities in 2006. The main causes continue to be what is referred to as the Big Four: electrocutions, being caught by, struck by or falls. And falls continues to be the largest category. Additionally, it was noted that the incident is higher for two groups. The rate involving Hispanics is significantly above those from other ethnic groups and those with one year or less of work with the current employer is the second group. A possible reason for this is that individuals in these two groups may not have received adequate safety training. Whatever the reason the need to improve the safety on residential construction projects is evident.

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