INJURY UPDATE

*A Report to Oklahoma Injury Surveillance Participants**

March 31, 2003

Construction-Related Fatalities, Oklahoma, 1998-2001

Construction work is one of the most dangerous occupations in the United States, according to the Bureau of Labor Statistics, U.S. Department of Labor. In 2000, a total of 5,915 occupational deaths were recorded in the U.S. (rate: 4.3 deaths per 100,000 workers); almost one-fifth of these deaths (1,154 deaths) were construction-related (rate: 12.9 deaths per 100,000 workers). The construction fatality rate ranked third after mining (rate: 30.0 deaths/100,000) and agriculture (20.9 deaths/100,000).

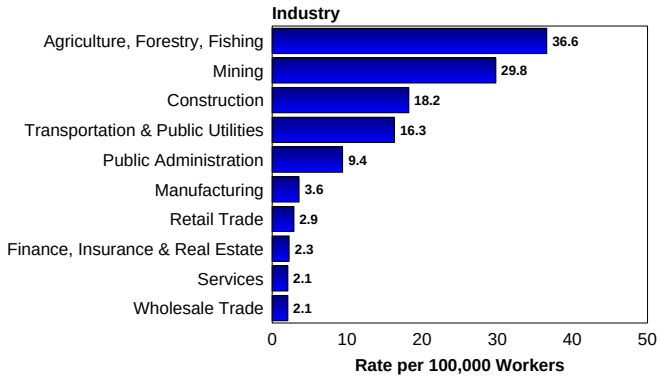
Since July 1997, the Injury Prevention Service of the Oklahoma State Department of Health has been collecting data on work-related injury deaths in Oklahoma through the Fatality Assessment Control and Evaluation (OKFACE) project, which is funded by the National Institute for Occupational Safety and Health. Data were collected from death certificates, the Office of the Chief Medical Examiner, Occupational Safety and Health Administration, Public Employees Occupational Safety and Health Program, Worker's Compensation Court, and newspapers. Hospital medical records and law enforcement reports were also used to provide supplemental information.

RESULTS

A total of 432 work-related fatalities were identified in Oklahoma between 1998 and 2001 (rate of 6.7 deaths per 100,000 workers). During this four-year time period, there were 74 deaths (average 19 deaths per year) identified in the construction industry (SIC 1521-1799). Approximately 6% of Oklahoma workers were in the construction industry, yet construction-related fatalities accounted for 18% of all work-related deaths; the annual construction-related death rate (18.2 deaths per 100,000 construction workers) ranked third behind agriculture and mining and was 2.7 times higher than the overall rate for all industries (Figure 1).

Ages of persons who died ranged from 13 to 80 years with a mean age of 39 years (Figure 2). Two-thirds (67%, 51/76) of deaths occurred among workers under 45 years of age. The youngest worker was a 13-year old migrant youth who was killed while doing a masonry job on a scaffold. There were no female construction workers fatally injured during this time period. Eighty percent of persons who died were white, 4% were black, 4% were Native American, and 12% were of unknown race. Of the 9 persons with unknown race, 8 workers were of Hispanic ethnicity.

Figure 1. Annual Rate of Work-Related Fatality by Industry,* Oklahoma, 1998-2001



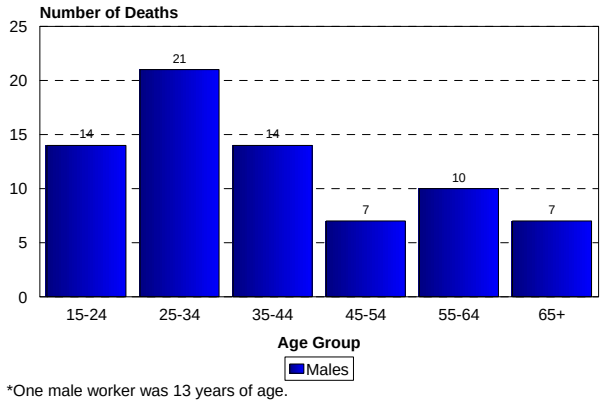
*According to Standard Industrial Classification Manual 1987, Office of Management and Budget

*The INJURY UPDATE is a report produced by the Injury Prevention Service, Oklahoma State Department of Health. Other issues of the INJURY UPDATE may be obtained from the Injury Prevention Service, Oklahoma State Department of Health, 1000 N.E. 10th Street, Oklahoma City, Oklahoma 73117-1299, 405/271-3430 or 1-800-522-0204 (in Oklahoma). INJURY UPDATES and other IPS information is also available at www.health.state.ok.us/program/injury.

Table 1 shows the overall distribution of construction-related deaths by occupation during the four-year time period in Oklahoma. Over half of the deaths occurred among special trade contractors, followed by heavy construction and general building contractors (Table 2).

Falls (36%, 27/74) were the leading cause of construction-related deaths (Table 3). Over one-third (37%, 10/27) of the falls were falls from ladders (6) and/or scaffolds (4). An additional 33% (9/27) occurred from falling from or out of buildings or other structures. Electrocution and motor vehicle crashes were the second and third leading causes of construction-related deaths. Almost half (47%, 7/15) of electrocution-related deaths occurred among electricians and electrical power installers/repairers. Fatal injuries from highway work-zone incidents accounted for a total of 9 (12%) construction-related deaths. Two-thirds (67%, 6/9) of the highway work-zone incidents were associated with being hit or run over by motor vehicles on public highway or street work-zones. Two incidents (22%) were due to machinery-related deaths, where a failure of a crane and an excavating tractor rollover killed the highway construction workers. One death occurred when a worker was struck by a concrete drain box that was broken while being positioned at a street construction site.

Figure 2. Construction-Related Fatalities by Age,* Oklahoma, 1998-2001



*One male worker was 13 years of age.

Table 1. Number of Construction-Related Fatalities, By Occupation, Oklahoma, 1998-2001

Occupation	Deaths	Percent
Construction laborers	24	32%
Electricians, electrical power installer/repairers	11	15%
Construction crew-chiefs or foremen	9	12%
Roofers	8	11%
Welders	8	11%
Painters	3	4%
Plumbers	3	4%
Drywall installers	2	3%
Machinery maintenance workers	2	3%
Other (1 carpenter; 1 masonry worker; 1 part-time delivery; 1 machine operator	4	5%
TOTAL	**74**	**100%**

Nearly three-quarters (55/74) of construction-related deaths occurred on the day of the incident; 5% (4/74) of persons died within 24 hours and 21% (15/74) of deaths occurred between 2 and 18 days after the incident. The number of construction-related deaths was highest between June and November. Time of incident was not known for 5 injury events; construction-related incidents in Oklahoma occurred between 6:00 a.m. and 8:00 p.m., with 77% (53/69) occurring between 8:00 a.m. and 4:00 p.m. Tulsa County had more than twice as many deaths as Oklahoma County (Figure 3).

CASE BRIEFS

- A 50-year old roofer and co-workers were working on construction of a warehouse. The victim fell through a skylight opening, which had been uncovered in preparation for installing the skylight and roof decking. The decedent fell from a height of 33 feet, struck his head on the cement floor and died two hours later.
- A 36-year old highway maintenance worker was struck by a pickup truck going 60 miles per hour as he entered the roadway to remove debris. There was no flagman at the scene at the time of the incident. The victim's body was carried on the right front fender of the truck for about 100 feet and was further dragged for an additional 120 feet before the wheels of the vehicle ran over his body.
- A 38-year old welder was working on a platform (scaffold) attached to a forklift at a convenience store that was under construction when he fell 8-10 feet from the scaffold. The decedent was treated in a hospital for 3 days for extensive head trauma before he died.

- A 54-year old foreman was working on a road construction project. The foreman was reportedly facing away from a heavy truck, which had a large bucket attached to its rear. The driver of the vehicle was backing toward him, apparently unaware that the decedent was standing behind the truck. Witnesses reported that the victim grabbed onto the bucket when he realized the truck was too near to escape. The bucket was in the process of being raised when the driver became aware the victim was holding onto the bucket. The driver stopped abruptly, which caused the decedent to be thrown from the bucket, and he struck his head on the concrete.
- A 21-year old cable installer was working in a television tower approximately 350-400 feet above ground level. Unexpectedly, a thin piece of sheet metal fell from above. Someone yelled to warn him of the falling object, but he had already unlocked himself from the safety line. He tried to dodge the falling object by repositioning himself but lost his footing and the falling metal struck him. The decedent fell 200 feet to a lower area inside the tower. The decedent sustained massive blunt force trauma and died at the scene.

Table 2. Construction-Related Fatalities by Construction Activities, Oklahoma, 1998-2001

SIC* Code	Activities	Deaths	Percent
	Special Trade Contractors	**42**	
1731	Electrical work	10	14%
1761	Roofing, siding, and sheet metal work	7	9%
1799	Miscellaneous special trade contractors, not elsewhere classified	6	8%
1742	Plastering, drywall, acoustical, and insulation work	4	5%
1711	Plumbing, heating and air-conditioning	4	5%
1791	Structural steel erection	3	4%
1721	Painting and paper hanging	2	3%
1741	Masonry, stone setting/other stone work	2	3%
1751	Carpentry work	1	1%
1771	Concrete work	1	1%
1795	Wrecking and demolition work	1	1%
1796	Installation/erection of building equipment	1	1%
	Heavy Construction	**23**	
1623	Pipeline, communications, and power line construction	11	15%
1611	Highway and street construction, except elevated highways	8	11%
1622	Bridge, tunnel, and elevated highway construction	3	4%
1629	Dock Construction	1	1%
	General Building Contractors	**9**	
1542	Nonresidential buildings, other than industrial buildings and warehouses	5	7%
1541	Industrial buildings and warehouses	2	3%
1521	Residential buildings	2	3%
	TOTAL	74	99%

*According to Standard Industrial Classification Manual 1987, Office of Management and Budget; Indianapolis, IN: JIST Works, Inc. (ISBN: 1-56370-064-6)

- A 31-year old electric lineman was working on low hanging wires during an ice storm. The victim was trying to clear ice from the power lines when witnesses saw him grabbing the live power line and the neutral line at the same time. The decedent apparently thought the power was off at the time. Electric current entered the decedent's left hand, traveled across his chest and exited through his right hand to a nearby hot line. The decedent was transported to a local hospital where he was pronounced dead.
- A 19-year old laborer was working at a pipeline construction site. The laborer was standing near a backhoe while it was swinging its bucket around. The backhoe's bucket struck the laborer on the chest, knocking the victim backwards several feet. The victim was able to get up and walked for approximately 20 feet before he collapsed. The victim's co-workers tried to resuscitate him before emergency medical personnel arrived. When they arrived, however, the victim was found without pulse and was breathless. He was pronounced dead an hour later at a local hospital.

- A 27-year old welder and his co-workers were working on an oilfield tank. They had just installed a ladder on the side of the tank. The welder then climbed up the ladder and was on top of the tank when it caught fire and exploded. The decedent was approximately 30 feet above ground level when the tank exploded. He was thrown 30 feet away from the tank and the tank traveled approximately 45 feet in the opposite direction as a result of the explosion.

Table 3. Causes of Construction-Related Fatalities, Oklahoma, 1998-2001

Type of Incidents	Deaths	Percent
Falls	**27**	**36%**
Fall from elevation	24	
Fall on same level	1	
Other and unspecified fall	2	
Electrocution	**15**	**20%**
Motor Vehicle Crashes	**11**	**15%**
Traffic	10	
Nontraffic	1	
Machinery	**6**	**8%**
Struck and/or Crushed by Object	**6**	**8%**
Fire/Explosion	**4**	**5%**
Homicide	**2**	**3%**
Other 1 drowning, 1 heat stroke, 1 suicide	**3**	**4%**
TOTAL	**74**	**99%**

PREVENTION

Construction workers are exposed to hazardous environments, therefore it is crucial for employers to develop and implement comprehensive, written policies and work practices regarding all hazards to which employees are actually or potentially exposed. Prevention strategies are typically specific to each task; employers and employees are encouraged to collaborate in implementing safety strategies. Employers should provide regular safety trainings and supply proper materials and equipment for use in performing high-risk tasks.

There are a number of agencies dealing with workplace safety in Oklahoma, including the Occupational Safety and Health Administration, the Oklahoma Department of Labor, and the Oklahoma Safety Council. Electronic versions of construction-related injury prevention guidelines are now readily available on the Internet. Also, OKFACE personnel conduct in-depth, on-site investigations for several work-related deaths in Oklahoma. Detailed reports on targeted injuries are prepared for dissemination to employers, organizations, and trade associations that can effect changes in workplaces. Reports describe the circumstances leading to the worker's death and provide preventive recommendations specific to the incident. The reports are available online at www.health.state.ok.us/program/injury/okface/index.html.

Prepared by: Elizabeth Kruger, M.P.H., Injury Prevention Service

Figure 3. Construction-Related Fatalities by County of Incidence
Oklahoma, 1998 to 2001