INJURY UPDATE

*A Report to Oklahoma Injury Surveillance Participants**

September 12, 2000

Work-Related Deaths in Oklahoma, 1998-1999

BACKGROUND

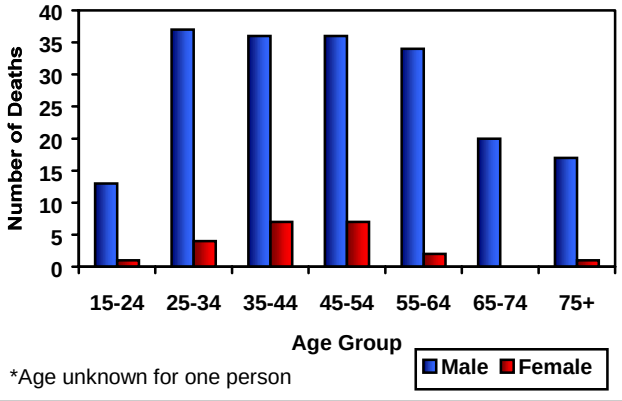
Work-related injuries are a significant public health problem in the United States (U.S.). The social and economic consequences of work-related injuries and deaths are enormous. The costs include years of potential life lost, lost wages, medical expenses, insurance claims, production delays, and equipment damage. The National Institute for Occupational Safety and Health (NIOSH) is a federal agency for education and research relevant to safety and health in the workplace. NIOSH reports 17 workers die at work in the U.S. each day, and an average of 9,000 workers sustain disabling injuries. A NIOSH-funded study estimated that the annual direct and indirect economic burden of work-related injuries is $145 billion. The U.S. Bureau of Labor Statistics also reported that in 1998 there were 6,026 work-related deaths (rate of 4.5 per 100,000 workers) across the nation.

On July 1, 1997, fatal work-related injuries became a reportable condition in Oklahoma. The Injury Prevention Service (IPS) of the Oklahoma State Department of Health monitors work-related injury deaths in Oklahoma through the Fatality Assessment Control and Evaluation (OKFACE) project, which is funded by NIOSH. The OKFACE project conducts active statewide surveillance of work-related injury deaths, including public and private sectors. The goal of the OKFACE project is to determine the epidemiology of fatal work-related injuries and to identify and recommend prevention strategies. Data are collected from multiple sources including the Oklahoma State Department of Health Vital Statistics Division, the Office of the Chief Medical Examiner, the Occupational Safety and Health Administration (OSHA), the Public Employees Occupational Safety and Health Program, Workers' Compensation Court, and a newspaper clipping service. Hospital medical records and law enforcement reports are also used to provide supplemental information.

RESULTS

From January 1, 1998 through December 31, 1999, 216 work-related deaths were identified in Oklahoma (106 deaths in 1998 and 110 deaths in 1999). The crude work-related death rates in both 1998 and 1999 were 7 deaths per 100,000 workers. Ages of persons who died ranged from 17 to 92 years of age, with a mean age of 48 years (Figure 1). Males outnumbered females 9 to 1, with males accounting for 90% (194/216) of the work-related deaths. Eighty-eight percent of persons who died were white, 4% were black, 3% were Native American, and 1% was Asian or Pacific Islander. Race was not known for nine persons (4%).

Figure 1. Work-Related Deaths by Gender and Age*, Oklahoma, 1998-1999



*Age unknown for one person

*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.

The leading causes of work-related deaths were motor vehicle crashes (31%), followed by machinery (17%), and falls from elevation (14%). Other common causes of work-related deaths included homicide, electrocution, suicide at work, being struck and/or crushed by an object, airplane crashes, and explosion (Table 1).

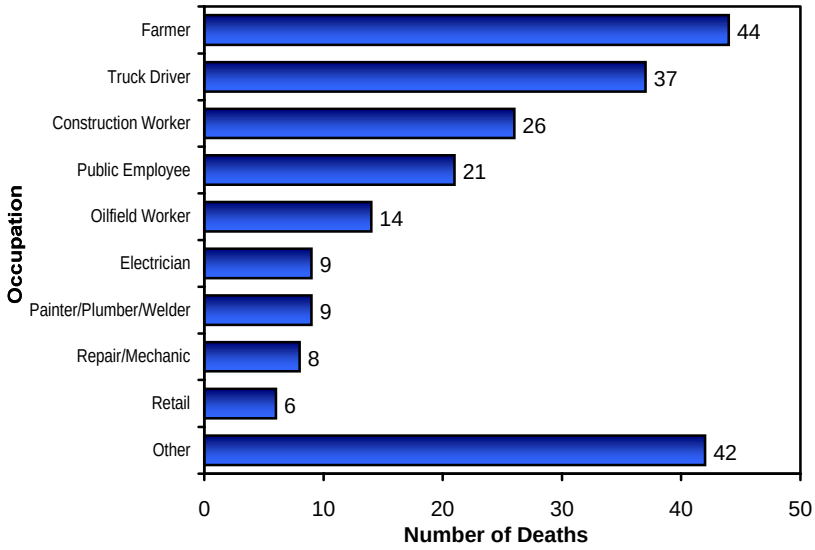
Table 1. Causes of Work-Related Deaths, Oklahoma, 1998-1999

Type of Incidents	No. of Deaths	Percent
Motor Vehicle Crash	67	31%
Machine-Related	36	17%
Falls from Elevation	30	14%
Homicide	19	9%
Electrocution	13	6%
Suicide at Work	12	6%
Struck and/or Crushed by Object	8	4%
Airplane Crash	7	3%
Explosion	4	2%
Drowning	3	1%
Exposure to Excessive Heat	3	1%
Animal-Ridden Incidents	3	1%
Long-term Effect of War Injuries	3	1%
Confined Space	2	1%
Highway Work Zone	2	1%
Incidental Drug Ingestion	2	1%
Incidental Gunshot Injuries	2	1%
TOTAL	**216**	**100%**

Farming was the occupation resulting in the greatest number of work-related deaths in Oklahoma; 44 deaths (20%) were farming-related incidents. Truck driving (17%) and construction (12%) were the occupations with the second and third greatest number of deaths statewide. Additional occupational fatalities occurred among public employees, oilfield workers, maintenance-type workers, retail business owners/workers, and others such as pilots, health care providers, persons involved in services (e.g., car sales, bar or club, food), and computer services (Figure 2).

Traumatic head injuries were the most frequently reported immediate cause of work-related deaths, contributing to 38% of deaths. The next most frequent immediate cause of death, traumatic chest injuries, accounted for 19% of deaths. Multiple traumatic injuries were responsible for 16% of deaths (Table 2). Seventy-seven percent (166/216) of deaths occurred on the day of the incident; ten persons (5%) died the next day and four persons (2%) died two days later. Thirty deaths (14%) took place between 3 days to 6 months after the incident happened. The other six persons (3%) succumbed to their injuries after 1 year to 42 years after the incident occurred. These workers died from complications of long-term effects of work-related injuries.

Figure 2. Work-Related Deaths by Occupation, Oklahoma, 1998-1999



Work-related incidents most commonly occurred in the warmer months of the year, May through September (Figure 3). Sixty-nine percent of work-related incidents occurred between 8:00 a.m. and 8:00 p.m., with the highest frequency (30%, 65/216) between noon and 4:00 p.m. (Figure 4). The geographic distribution of work-related deaths is depicted in Figure 5.

More than one-third (38%) of work-related deaths were initially identified through Vital Statistics, followed by a statewide newspaper clipping service (24%), the Office of the Chief Medical Examiner (19%), OSHA (10%), Department of Public Safety (5%), and others (4%).

CASE BRIEFS

- A 44-year old traveling retail sales person was traveling on the outside lane of a street under construction. Reflective road cones had been set out and a large street sweeping truck was traveling on the inside lane. The sales person apparently thought he had passed the work zone and he moved his vehicle into the inside lane. He rear-ended the street-sweeping truck at a speed of approximately 50 miles per hour. He died at the scene from abdominal and chest trauma.

- A 17-year old farmer was pulling a round hay baler with a tractor. Evidence suggests that the round hay baler became jammed and the clutch temporarily shut down the power take-off (PTO) device. The farmer apparently climbed onto the baler to clear the jammed wheat straw by using his feet. The jam cleared, and the clutch put the PTO back into motion. The baler rollers suddenly started moving and trapped the farmer's leg inside the baler. The rollers and belts spinning around the hay started a fire. The farmer was found suspended inside the burning hay baler. He died at the scene from smoke inhalation and burns.

- A 50-year old laborer for a construction contractor was part of a two-man crew installing sealing tape on a metal roof decking. The laborer stood, turned, and stepped through a skylight opening that had been uncovered in preparation for installing a skylight. He died from severe head injuries he received from the 33-foot fall.

- A 27-year old police officer was responding to an emergency call with his siren and flashers activated when he entered an intersection. A van struck the patrol car on the driver-side and the officer was pinned in his vehicle. He was pronounced dead at the scene from multiple injuries.

- A 54-year old highway flagman was standing near his parked truck holding a traffic control sign. He stepped onto the roadway to slow oncoming vehicles that were approaching the construction zone at

Table 2. Immediate Causes of Work-Related Deaths, Oklahoma, 1998-1999

Causes	Percent*
Traumatic Head Injuries	38%
Traumatic Chest Injuries	19%
Multiple Traumatic Injuries	16%
Suffocation	6%
Traumatic Neck Injuries	5%
Thermal Burns	5%
Electrocution	4%
Internal Injuries	3%
Drowning	2%
Traumatic Abdominal Injuries	2%
Others (Complications of Leg Injuries, Heat Stroke, Necrotizing Fasciitis, etc.)	7%
*Percent does not add up to 100 due to multiple immediate causes of death.	

Figure 3. Work-Related Deaths by Month of Incident, Oklahoma, 1998-1999

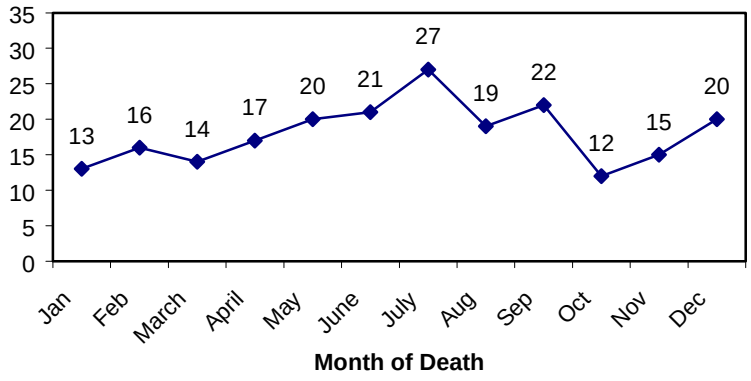
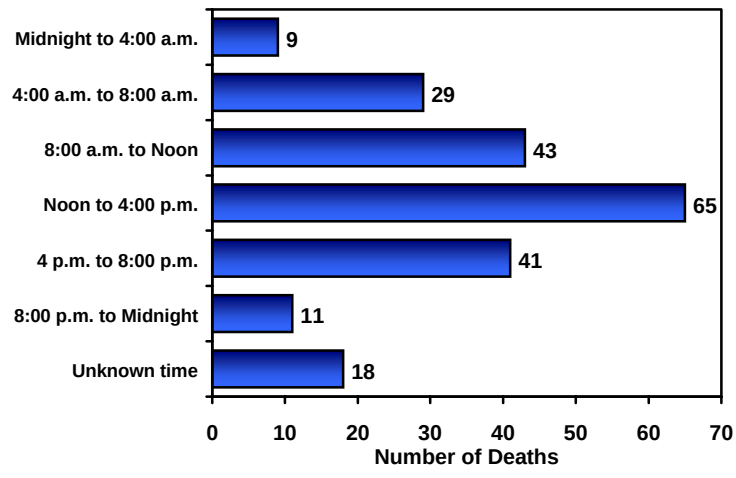


Figure 4. Work-Related Deaths by Time of Incident, Oklahoma, 1998-1999



high speed. The first oncoming car hit the flagman's parked truck, and a second vehicle hit the first car, which subsequently hit the flagman. He was transported to a hospital and died a few hours later from massive head and trunk injuries.

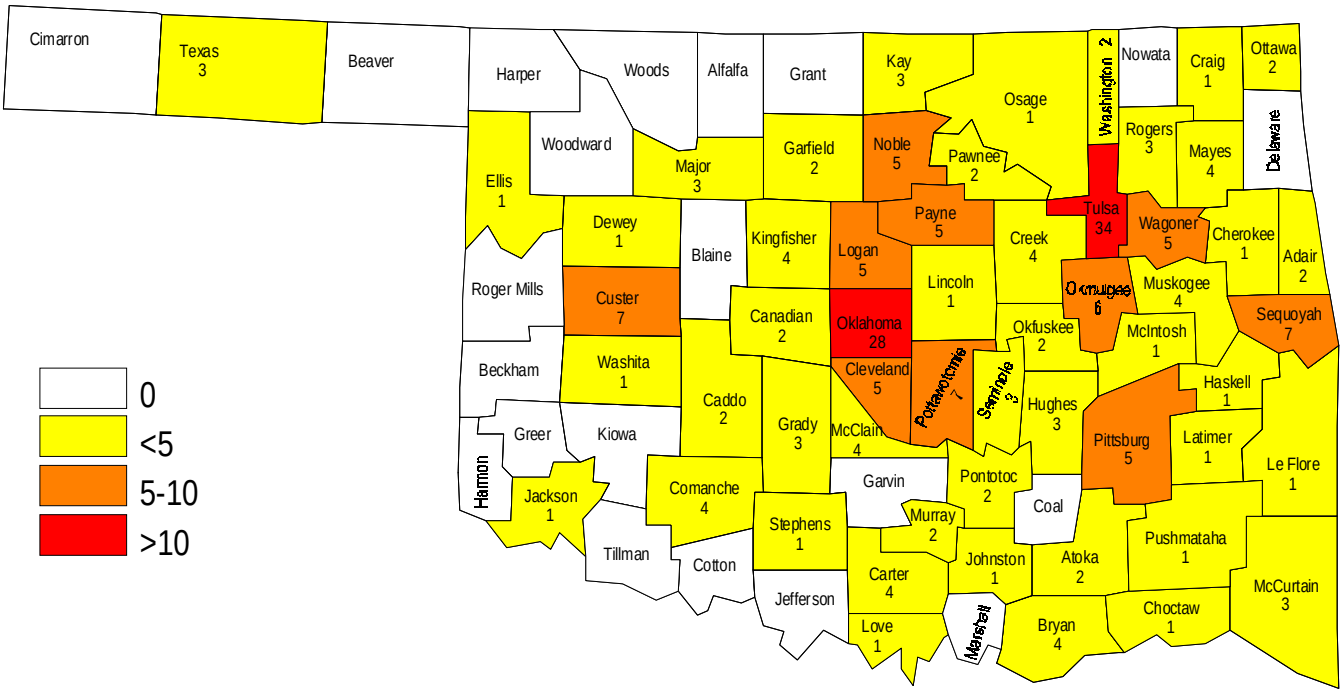
- A 35-year old farmer attempted to cut a large tree on his farm. He backed a tractor equipped with a box-blade against the tree hoping to shove the tree backwards. The tree came down on the farmer and pinned him between the tractor and the tree. He died from suffocation.

- A 41-year old driver of a tractor-trailer was towing a mobile home. As he approached a bridge on a highway, his tractor-trailer went left of center on a curve and hit another tractor-trailer rig, which caused the mobile home to jack-knife. The front end of the tractor-trailer jumped the bridge railing and slid along it until it struck the opposite bridge abutment and separated the cab from the trailer. The driver was ejected and sustained blunt injuries to the head and chest. He succumbed to his injuries an hour later at a nearby hospital.

- A 31-year old male supervisor for a drywall contractor was part of a two-man crew installing drywall inside an addition to a hospital. The supervisor was working from a 6-foot mobile scaffold installing drywall on the top section of the room when he suddenly fell and hit his head on the floor. The scaffold was not fully planked and the wheels were not locked. He died at a hospital the following day from head injuries.

- A 65-year old male was working at a golf course installing electric valves on an irrigation system. He dug out the area where the valve was to be placed. The ground was wet and the wires leading to the valve were also wet. He failed to shut off the main breaker at the breaker box. He connected two wires together, and apparently when he crimped them to make a connection, he was electrocuted. Some people on the golf course became concerned when they noticed that the decedent had been in the same position for a long time and went to get help. He was pronounced dead on arrival at a hospital.

Figure 5. Work-Related Injury Deaths by County, Oklahoma, 1998-1999



- A 40-year old petroleum foreman had just completed adjusting the counterweights of a pumping unit. The pumping unit was turned off. The foreman was wearing a hard hat and steel toe safety shoes when the incident occurred. He started up the pumping unit and stepped close to the running unit to examine something. He had his back to the counterweights and was struck on his head and back by the counterweights. The foreman died upon arrival at a hospital from a basilar skull fracture and chest trauma.

- A 33-year old convenience store clerk was found dead on the rest room floor of the store where she worked. She had five gunshot wounds to her head. The store was reportedly located on a rural stretch of a road. Robbery was believed to be the motive for the homicide as money was missing after the incident. This homicide victim was the third employee murdered in the same store in 17 months.

- A 25-year old armored truck driver was driving a truck loaded with $80,000 worth of newly minted dimes. He reportedly fell asleep at the wheel, and the truck went off the roadway into the center median and up a bridge embankment. The truck then went airborne and crashed into another embankment and burned. A witness of the incident reported that the force of the crash was so great that it ripped the truck apart and scattered the minted dimes. The driver and his passenger burned to death in the cab of the truck.

- A 29-year old pump service worker was working on a 1,000-gallon gasoline storage tank when it exploded. He was using a grinder to grind off bolts on a cover plate when a spark caused the tank to explode. The explosion blew the worker approximately 230 feet; he died instantly.

- A 67-year old U.S. Marine became a quadriplegic when he received a gunshot wound during the Korean War. He had recurrent bouts of urosepsis from an indwelling foley catheter that had been in place since his injury. He died from complications of his injury 42 years later.

PREVENTION

Work-related injuries and deaths are often preventable. To reduce work-related injuries and deaths, employers and employees must work together to develop and maintain a safe work environment. There are a number of agencies dealing with work-place safety in Oklahoma, including the Occupational Safety and Health Administration, the Oklahoma Department of Labor, and the Oklahoma Safety Council. Prevention recommendations are usually very specific to each work environment. 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 and organizations, such as union and trade associations that can effect changes in workplaces. The reports are electronically displayed on www.health.state.ok.us/program/injury/okface/index.html.

The following preventive measures are general interventions that may reduce work-related injuries and deaths:

- Identify exposures to hazards in specific industries and provide workers with proper training in prevention.
- Comply with existing OSHA standards for proper safety procedures and equipment tailored for specific industries.
- Develop, implement, and enforce comprehensive written safety programs.

- Post safety signs to remind workers of potential hazards in working environments.
- Provide well-lighted work environments.
- Protect workers from exposure to electrical hazards.
- Require workers to wear personal protective equipment specific for their work environment.
- Conduct proper maintenance of equipment with all safety features in place.
- Watch for road closures and detouring of traffic.
- Drive with courtesy and observe traffic laws.

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