

INJURY UPDATE

*A Report to Oklahoma Injury Surveillance Participants**

September 24, 2004

The Dangers of Traveling by Foot: Pedestrian-Related Traumatic Brain Injuries in Oklahoma, 1992-2002

INTRODUCTION

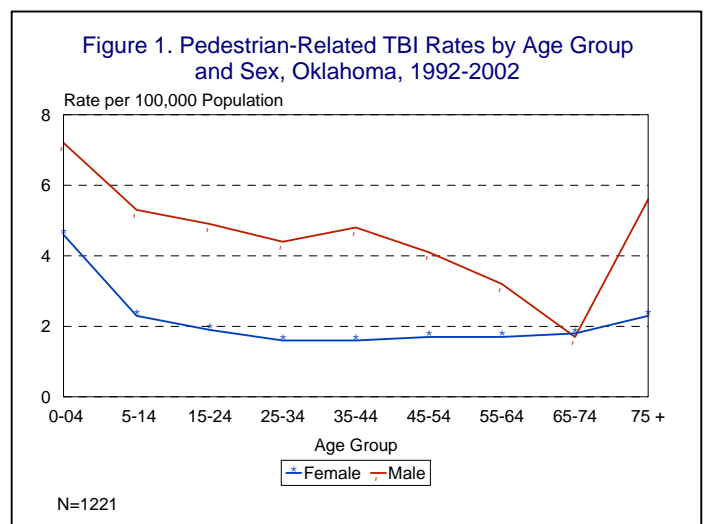
People on foot have been the most unprotected, exposed, and slow moving, and thus vulnerable and at risk of both malevolence and injury. The hazards for people on foot increased dramatically as wheeled or runner carts, coaches, and other manner of travel were designed. Today, many environmental and personal factors contribute to pedestrian injuries.

Of the 36,156 persons who were hospitalized or died with a traumatic brain injury (TBI) in Oklahoma from 1992 to 2002, 3% were pedestrians. This report describes the occurrence of pedestrian injuries and the demographic and epidemiologic characteristics associated with these injuries. Persons standing, walking, running, sitting/lying down or in a wheelchair on any type of road or passageway are considered pedestrians. Common dangers and the unique factors that lead to injuries among pedestrians are discussed. Specific recommendations for prevention are made based upon the data, case briefs, and consideration of effective ways to reduce pedestrian injuries and their possible long-term consequences.

DESCRIPTIVE EPIDEMIOLOGY

Based on the analytic findings of surveillance data collected on persons who were hospitalized or died from a TBI, a total of 1225 pedestrian injuries occurred in Oklahoma from 1992 to 2002 (rate 3.3 per 100,000 population). Thirty-seven percent (459/1225) of persons died. This fatality rate was the highest among injury causes except for gunshot injuries with 94% fatal; motor vehicle crashes were 27%. Three percent of injuries were work-related. Except for a high of 145 injuries in 1992, the number fluctuated between 92 and 119 injuries per year. Injuries occurred in 72 of Oklahoma's 77 counties.

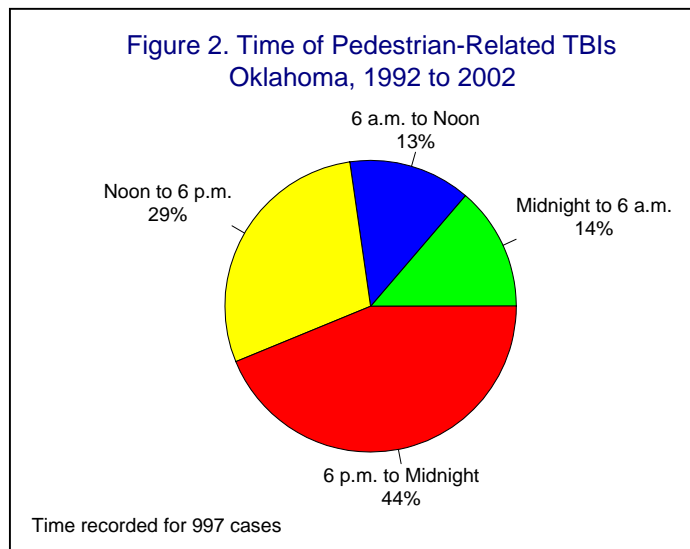
The age of persons injured ranged from 0 to 99 years with a mean of 34 years (median 29 years). The rate of injuries varied by age group and sex (Figure 1). Injury rates were highest among 0-4 year olds. Rates were higher in males than females in all age groups except for 65-74 year olds. Of the 128 injuries that occurred in the 65 years and older age group, 80 (63%) were over 74 years of age. Males accounted for 69% of all injuries (rate 4.7 per 100,000 compared to 2.0 for females).



*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.

Blacks had the highest rate of injury (5.5 per 100,000 population) followed by whites and Native Americans (3.2 and 2.9, respectively).

Of the 997 (81%) cases with known time of injury, the highest number of injuries occurred between 6:00 p.m. and midnight (Figure 2). Seasonal contrasts showed injuries were lowest from January to March. Of the 1114 (91%) cases with recorded intentionality, 95% were unintentional, 3% were homicide and 2% suicide. Alcohol or drugs contributed to 28% and 6% of injuries, respectively, for persons over 14 years of age. Fifty-four percent of persons with alcohol as a contributing factor died compared to a 32% fatality rate for those where alcohol was not present.



Some characteristics of pedestrian injury survivors are shown in Table 1. Because pedestrians are unprotected, injuries were often severe or resulted in death. Although the proportion that survived was high among 0-14 year olds, survival was little more than half for most other age groups. Only 48% of persons 65 years and older survived. The seriousness of pedestrian injuries is also shown by the discharge destination where 70% were sent home and 17% were discharged to an inpatient rehabilitation center.

Place and Activities Related to Pedestrian-Related Traumatic Brain Injuries

Where the injury occurred and the circumstances leading to the event varied dramatically among cases and included a web of causation such as lack of recognition of imminent danger, risk taking behavior, and lack of compatibility between the person and the scene, as well as the common factors of age, mental and physical status, and environmental conditions. Children were more likely to be injured in streets as they played or darted across to retrieve a ball or a pet, or in driveways when they were not noticed by drivers entering or exiting the driveway. Pedestrians who were backed or rolled over by a vehicle (9%) were mainly children or adults to whom the driver did not communicate his/her intended driving actions. The most common places where pedestrian injuries occurred are shown in Figure 3. The great majority of pedestrians were struck on a roadway. Although complete details were not available for all persons, at least 62 persons were crossing a street, 44 persons were attempting to cross a highway, and 48 persons were stopped on the roadway with their vehicles.

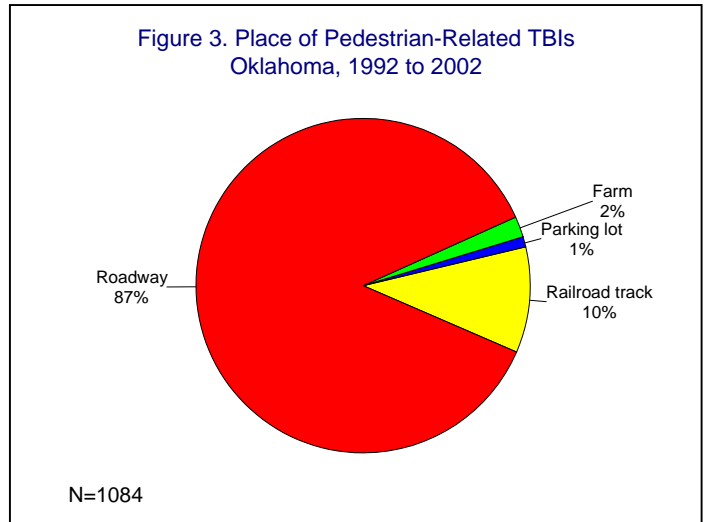
Table 1. Characteristics of Survivors of Pedestrian-Related TBI, Oklahoma, 1992 to 2002

Factor	# Survived	Percent
Age Group		
0-4	111	74%
5-14	178	83%
15-24	113	60%
25-34	85	56%
35-44	108	58%
45-54	66	52%
55-64	43	58%
65 +	61	48%
Discharge Destination		
Home	532	70%
Skilled nursing facility	39	5%
Nursing home	33	4%
Rehabilitation	131	17%
Other	31	4%

Note: Age not known for one survivor.

CASE BRIEFS

- A 4-year old child bought an ice cream cone from the ice cream truck. She ran out in front of a car that was passing the ice cream truck, which was parked on the side of the road. She suffered a concussion and had no apparent limitations at discharge.
- Two children, aged 6 and 7 years, exited the bus at their regular bus stop. The driver was distracted by an incident inside the bus and thought both children had crossed the road. The bus pulled forward and ran over and killed the 7-year old.
- A 2-year old child, who was being watched by two relatives, got out the back door and ran around the house toward the car as her father was backing out of the driveway. He did not know she was there until he ran over her. Her head was crushed, and she did not survive.
- A 39-year old man had been sent by a temporary labor service to work at a plant. He reportedly was drunk, told to go home, and left the plant on foot. A short time later, a train was traveling near the plant. The conductor observed the man lying on the tracks, sounded the horn, and attempted to stop but could not. The man was killed instantly of multiple injuries.
- The 43-year old driver of a vehicle left the roadway and hit several trees. One of the passengers told the driver to stay with the vehicle, and the passenger would get help. The driver and another passenger left the vehicle and were standing in the middle of the roadway when they were hit by a vehicle and killed.
- A couple was arguing as they drove along the highway. The female driver pulled off and the 48-year old man got out and started walking in the roadway. He was hit and knocked 72 feet by a large pickup. A second pickup ran over him when he was down. He did not survive.
- A 40-year old woman was jogging on a park trail adjacent to a wide road. A driver lost control of his vehicle, crossed two lanes, and landed on the jogging path. The jogger was facing away from oncoming traffic and did not see the vehicle. She was thrown 60 feet and died of multiple injuries.
- An 83-year old man in a wheelchair was struck and killed by the driver of a large truck as he was crossing the street. The driver said he did not see the man.
- A highway construction worker was with his crew. Traffic was slowing down for the construction, and one driver hit the clutch instead of the brake swerving into the lane of highway where the workers were. A 28-year old crewman was struck and died.
- A 28-year old emergency medical service worker and his partner were helping a couple whose car went into an embankment. They helped the woman up the slope and all three were standing at the back of the ambulance. The driver of a vehicle struck and killed all three. It was raining heavily and police officers were there with lights on so drivers would slow down.



DISCUSSION

People who travel by foot outside of the home are at risk of being struck by any type of motorized vehicle, bicycle, or other mode of travel. To reduce the number and seriousness of injuries requires the attention and consideration of both drivers and pedestrians in all situations. Highways and interstate roadways are not constructed for pedestrian use, but in instances when a person has to walk on the roadside to seek help, caution must be exercised by both drivers and pedestrians. Personal factors such as deafness, sun in the driver's eyes, driving without lights, hitting the accelerator instead of the brakes, and arguing while driving precipitated many injuries. Eight injuries occurred when the driver crashed into a home or shop. On the highway, driver speed and inattention led to seven injuries among construction workers. The hazards of walking increased if alcohol and/or drugs were used by pedestrians or drivers because of decreased alertness, balance, and reaction time. Common risk factors associated with TBI-related pedestrian injuries were children's impulsiveness and not knowing the dangers of vehicles, substance use, not obeying basic pedestrian rules, and risky behavior. Many pedestrians do not recognize they are unprotected and vulnerable to injury by any type of transport.

RECOMMENDED PREVENTIVE MEASURES

- Look left, right, and left again before crossing a street, and walk on the crosswalk if one is available.
- Avoid walking on streets, highways, or train tracks when intoxicated or under the effects of drugs.
- Drivers and passengers should check for children and adults when entering or exiting driveways and parking spaces to make sure all is clear.
- Drivers and pedestrians should take road safety precautions when vehicles crash or are disabled on the road.
- Do not sit, lie down, or walk on or alongside railroad tracks since there is little time to escape and the engineer may not see the person or have time to stop the train.
- Avoid standing on or crossing a highway or interstate roadway.
- Always walk facing traffic so that you will be seen by and can see approaching vehicles.
- Drivers should be cautious and obey reduced speed limits in construction zones, school zones, and near school buses and ice cream trucks.
- Avoid walking in roadways whenever possible; use sidewalks if available.
- Wear light/bright colored clothing, fluorescent stickers, or use a flashlight to increase visibility when walking.
- Place flags on tall poles on wheelchairs to increase visibility in traffic.

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