

INJURY UPDATE

*A Report to Oklahoma Injury Surveillance Participants**

May 31, 2002

Heat-Related Deaths, Oklahoma, 1990 – 2001

Heat-related illnesses are a serious health problem. Each year more people in the U.S die from extreme heat than from hurricanes, lightning, tornadoes, floods, and earthquakes combined. During 1979-1998, a total of 7,421 deaths in the U.S. were attributed to excessive heat exposure with an average annual rate of 1.49 per million population, averaging nearly 400 deaths each year.

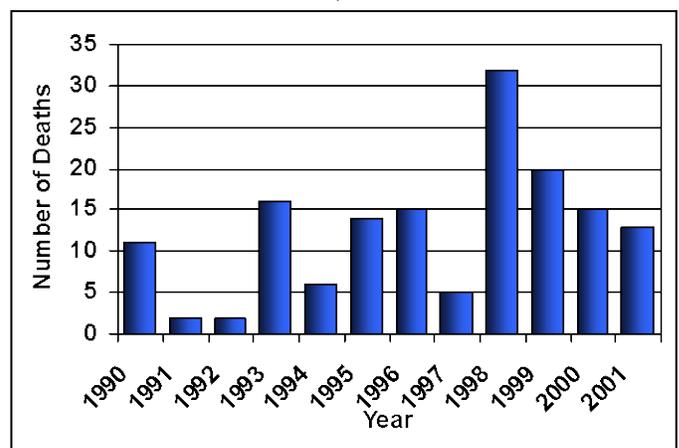
Several factors affect the body's ability to cool itself during extremely hot weather. When the body cannot perspire fast enough to get rid of heat, the body temperature rises causing vital organs to malfunction, and even death. Three common heat-related disorders are heat cramps, heat exhaustion, and heat stroke. Painful cramps in the stomach, arms and legs can result if heavy sweating drains a person of salt. Cramps are a warning that more serious heat disorders may occur if the stress continues. Heat exhaustion occurs when the body's cooling system cannot keep up with the heat stress. Signs of heat exhaustion include: heavy sweating, cool moist skin, body temperature greater than 100°F, weak pulse and normal or low blood pressure. Victims may be tired, weak, clumsy, upset or confused, have blurred vision, and are normally very thirsty. Heat stroke develops when all the water in the body available for perspiration has been used. This may cause the body temperature to rise to above 104°F, and the skin becomes hot, dry, and red. Victims in the later stages of heat stroke may faint or have convulsions and should be taken to a hospital immediately.

Lifestyle factors that can increase risk of heat-related deaths include: unbearably hot living quarters; lack of transportation; overdressing; and not understanding weather conditions. Other conditions related to risk include: age (the elderly and young children), obesity; reduced water intake; heart, lung, and kidney diseases; any illness that causes general weakness or fever; mental illness; poor circulation; sunburn; prescription drug use (diuretics, sedatives, tranquilizers, and certain heart and blood pressure drugs); and alcohol use.

Occupations that expose one to heat and/or fire also increase the risk. A person who is unable to remove himself/herself from an enclosed vehicle is at risk for a life-threatening crisis if left alone in a sun exposed car for even a relatively short period of time. This is especially so for infants and young children.

According to the Office of the Chief Medical Examiner, 151 heat-related deaths were recorded in Oklahoma between 1990 and 2001, with an average annual rate of 3.8 per million population. The ages of cases ranged from 1 to 90 years, with average age of 64 years. One-fifth of the deaths were recorded in 1998 (Figure 1).

Figure 1. Heat-Related Deaths by Year, Oklahoma, 1990-2001



*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 <http://ips.health.ok.gov>.

The average annual death rate for males was about 1.5 times higher than for females (4.6 vs. 3.1 per million population, respectively). The annual death rate of persons aged 65 and over was about 10 times higher than that of cases below age 65 (17.0 vs. 1.8 per million population) (Figure 2). Over half of the deaths (81/151) occurred in the month of July (Figure 3). The deaths were a result of exposure to high environmental temperatures directly or indirectly (indoors); three deaths resulted from malfunctioning heating units. The rate for blacks (8.6 per million population) was about two and a half times higher than that for whites (3.5 per million population) and almost four times that for Native Americans (1.9 per million population). About 39% of the cases were suffering from other conditions, including: diabetes mellitus, heart, lung and kidney diseases (24%); mental disorders (8%); and alcoholism and drugs (7%).

Among cases where place of injury was known, 70% (94/130) of the deaths occurred indoors. Persons 45 years and older were significantly more likely to die indoors (83%) than younger persons (27%) while persons under 45 were significantly more likely to die outdoors (73%) than persons aged 45 years and older (17%) (Table 1) Over half of the deaths (56%) occurred at the scene of injury, while 44% died in the hospital.

Oklahoma and Tulsa counties recorded the most deaths (55 and 17, respectively), however the average annual rate for Oklahoma County was 7.3 per million population and that for Tulsa County was 2.7 per million population. The highest average annual death rates were recorded for Carter (15 per million population), Marshall (14 per million population) and Jackson counties (11 per million population) (Figure 4.)

Figure 2 Heat-Related Deaths by Age and Sex, Oklahoma, 1990-2001

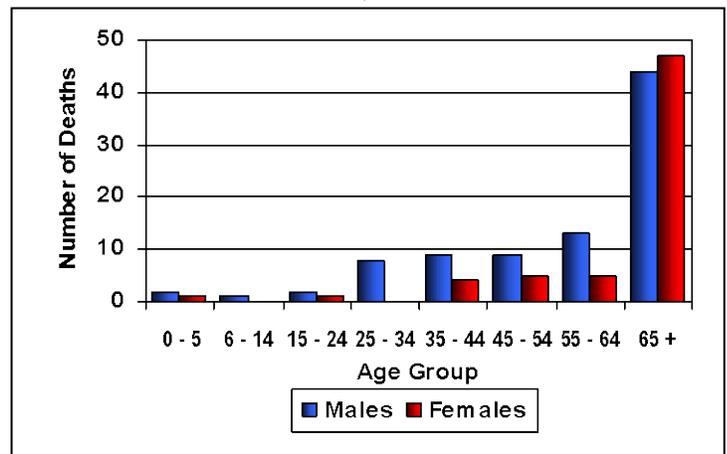


Figure 3. Heat-Related Deaths by Month, Oklahoma, 1990-2001

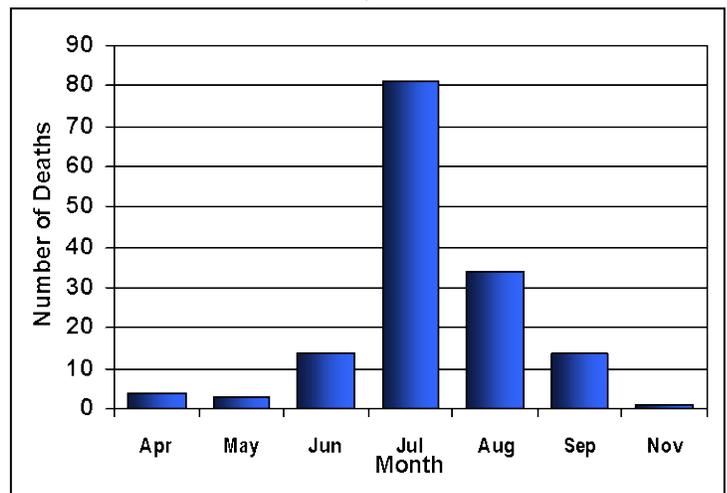


Table 1. Heat-Related Deaths by Age Group and Place of Injury, Oklahoma, 1990-2001

Age Group	Indoors	Outdoors
<45 years*	7 (27%)	19 (73%)
45+ years*	86 (83%)	18 (17%)
Total	93	37
Odds Ratio† =12.7; CI 3.6 – 34.2		

*Place of injury unknown/missing for 19 persons 45+ years and for 2 persons <45 years.

†Odds Ratio (of dying indoors) comparing persons 45+ to persons <45 years.

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