

INJURY UPDATE

*A Report to Oklahoma Injury Surveillance Participants**

September 19, 2005

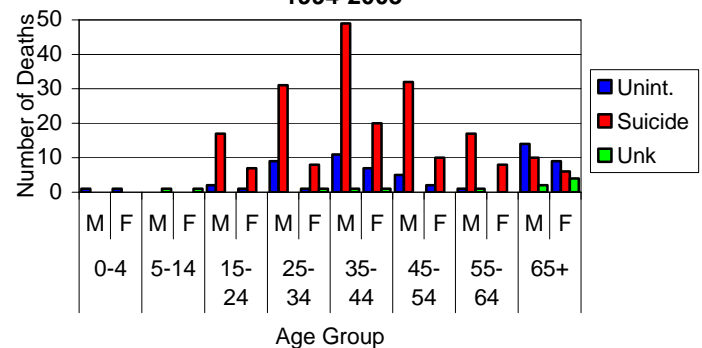
Carbon Monoxide-Related Deaths, Oklahoma, 1994-2003

Carbon monoxide (CO) related deaths fall under the broad category of poisonings. In 2002, poisonings were the second leading cause of unintentional deaths in Oklahoma and the United States. Carbon monoxide results in more fatal unintentional poisonings than any other agent. Each year, more than 500 Americans die from unintentional CO poisoning, and approximately 15,000 are treated in a hospital emergency department. More than 2,000 persons commit suicide by intentionally poisoning themselves with CO.

Carbon monoxide poisoning occurs by inhalation of a high concentration of CO, usually within an enclosed or semi-enclosed space. The Occupational Safety and Health Administration has established a maximum acceptable limit of CO exposure to 50 parts per million (ppm) over an 8-hour period. General health symptoms for persons who are exposed to higher levels of CO may include: headache, dizziness, weakness, fainting, nausea, vomiting, diarrhea, mental confusion, sleepiness, chest pain, and breathing difficulties. A 45-minute exposure to CO at 800 ppm can lead to death within 2-3 hours; at 12,800 ppm, death can occur within 1-3 minutes. Common sources of CO exposure include: car/truck exhaust, small gasoline engines, portable generators, charcoal and wood burning, room heaters, and fuel burning appliances. Unborn babies, infants, the elderly, people with chronic heart disease, anemia, or respiratory problems, and those in certain occupations such as firefighters, garage mechanics, welders, and police officers are all at an increased risk for CO poisoning. Because CO is a colorless, odorless, tasteless, non-irritating gas, many people do not realize they have been exposed until it is too late.

According to the Office of the Chief Medical Examiner, 291 carbon monoxide-related deaths were recorded in Oklahoma between 1994 and 2003 for an average annual rate of 8.4 per million population. The ages of cases ranged from 0 to 90 years, with an average age of 45 years. The average annual death rate for males was more than two times higher than for females (12.0 vs. 5.0 per million population). Beginning at age 15, males had a higher number of unintentional deaths and suicides than females in each age group. The highest number of suicides for both sexes occurred in the 35-44 year age group, while the highest number of unintentional deaths for both sexes occurred in the 65+ year age group (Figure 1). Whites had the highest average annual death rate of any race group, approximately four times that of blacks and Native Americans (10.5 vs. 2.6 and 2.7 per million population, respectively). Blacks and Native Americans had an equal percentage of deaths due to unintentional incidents and suicides, while a disproportionate amount (76%) of deaths among whites occurred as a result of suicide (Figure 2). The number of deaths peaked at 38 in 1999, with a high number of unintentional deaths (13) (Figure 3).

Figure 1. Carbon Monoxide-Related Deaths by Age Group, Sex, and Intentionality Oklahoma, 1994-2003



*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 are also available at www.health.state.ok.us/program/injury.

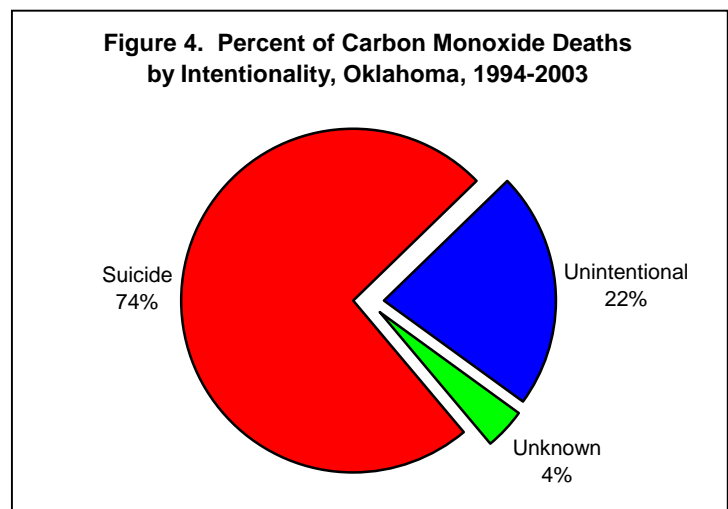
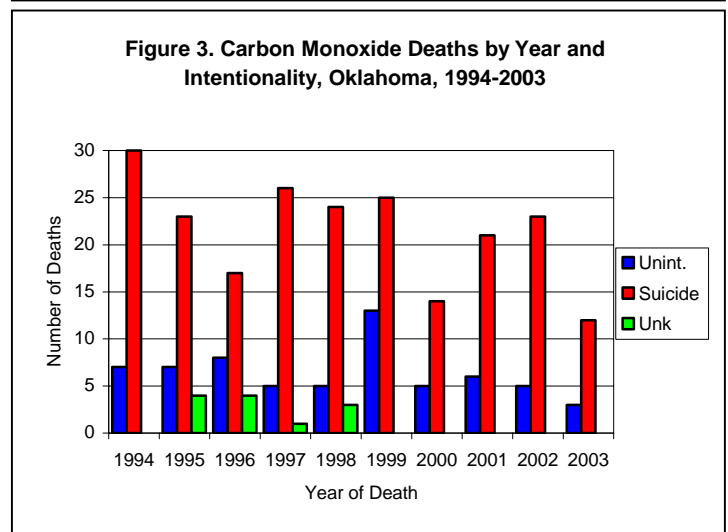
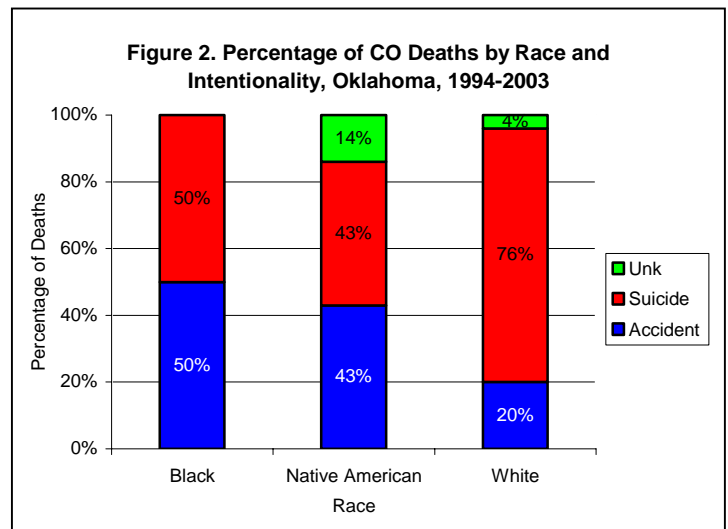
Seventy-four percent of all carbon monoxide-related deaths that occurred during this time period were classified as suicides, 22% were unintentional, and 4% were of unknown intent (Figure 4). Almost all suicides (98%) were committed using vehicle exhaust as the CO source. Slightly less than half of all unintentional exposures to CO resulting in death occurred from a source inside the home (47%). Vehicle exhaust was the second most common source of unintentional CO exposure (33%). Alcohol was involved in a similar percentage of unintentional and suicidal deaths (31% vs. 33%, respectively). Of decedents testing positive, the average alcohol level (0.11 g/dL) was above the legal limit of 0.08 g/dL (all intentions).

Unintentional deaths due to CO exposure were more likely to occur in the winter. The two coldest months (December and January) accounted for 33% of unintentional deaths. The highest number of suicides occurred in November (16%) and the lowest in May (5%) (Figure 5). The period of time between midnight and 4 a.m. accounted for the most deaths (all intentions) (Figure 6). The single most deadly hour for both unintentional incidents (22%) and suicides (34%) was between midnight and 1 a.m.

Oklahoma and Tulsa counties recorded the highest number of deaths (92 and 45, respectively). The highest average annual death rates were recorded for Grant County, Harper County, and Ellis County (41.5, 28.1, and 24.5 per million population, respectively). These counties and seven others had average annual death rates at least 68% above the state rate (Figure 7, page 4).

CASE BRIEFS

- An 85-year old female died of CO intoxication in her bedroom, after accidentally leaving her car running in the garage. Both the garage door and the door leading to the residence were closed.
- A 17-year old male committed suicide by CO poisoning in his pickup. A hose was running from the exhaust to inside the window, with his jacket plugging off the rest of the window.
- A 29-year old male and his common-law wife died of CO intoxication in their bedroom. They recently had a floor gas space heater installed, and the installer failed to attach a vent pipe.



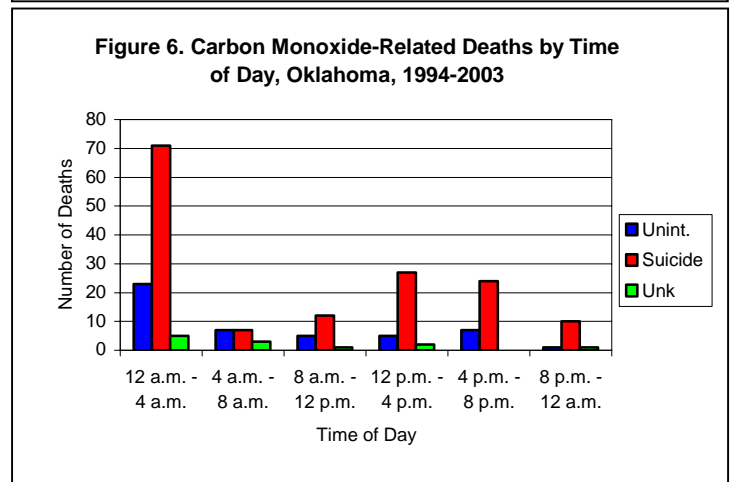
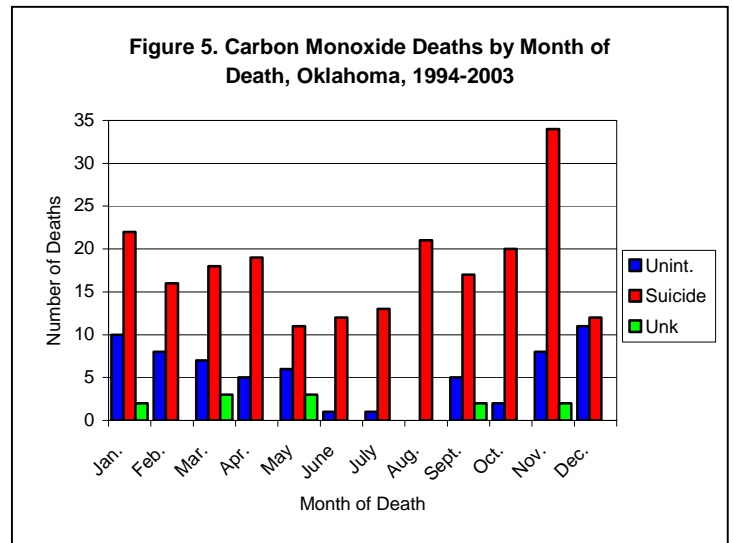
- A 39-year old male committed suicide by CO poisoning in his garage. He was found sitting in his running pickup with the garage door closed.
- A 40-year old male died of CO intoxication in his garage while working on his vehicle. It was a cold day and the garage door was down. Carbon monoxide quickly overcame him after starting his car.

PREVENTION

Since all people and animals are at risk for CO poisoning, it is important for everyone to recognize the signs and symptoms. People who are sleeping or have been drinking alcohol can die from CO poisoning before ever noticing symptoms. If you suspect you may have CO poisoning, call 911 or your local fire department and evacuate the premises immediately – get outside into fresh air.

Things you can do to prevent CO poisoning:

- Do not run a vehicle inside a garage attached to your house, even if you leave the garage door open.
- Install a CO detector on the wall or ceiling in an area central to all bedrooms.
- Properly install, maintain, and operate all fuel-burning appliances.
- Check and clean fireplace chimneys and flues at least once a year.
- Have a qualified service technician inspect furnaces, water heaters, and gas dryers annually.
- Do not use a gas oven or stove to heat a home.
- Use unvented fuel-burning space heaters only while someone is awake to monitor them, and open doors and windows in the room to provide fresh air.
- Routinely inspect automobile exhaust systems for defects.
- Routinely inspect automobile tailpipes for snow blockage during the winter months.
- Do not use a generator, lantern, camp stove, or charcoal in an enclosed area such as a tent, home, or garage.



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