CHAPTER SIX:
UNINTENTIONAL POISONING

Highlights

- The age-adjusted death rate for unintentional poisoning in Colorado has more than tripled from 2.2 deaths per 100,000 in 1980 to 7.3 deaths per 100,000 in 2003. On average, 310 Coloradans die from unintentional poisoning each year.

- Unintentional poisoning is among the leading causes of injury deaths for Coloradans ages 15-84. The death rate for unintentional poisoning is highest for males ages 35-44. The age-adjusted death rate for unintentional poisoning for men is twice the rate for women.

- On average, 1,169 Coloradans are hospitalized each year for unintentional poisoning. Men and women are about equally likely to be hospitalized for unintentional poisoning but for different types of agents.

Overview and trends

While they may not get the same level of news coverage given to homicides, fires, and drownings, unintentional poisonings are among the top five leading causes of injury deaths and hospitalizations in Colorado. The number of deaths due to unintentional poisoning is 1.6 times higher than the number of homicides, and hospitalizations for unintentional poisoning are as common as those for assault. Deaths and hospitalizations for unintentional poisoning are much more common than those for burn or drowning injuries. On average, 310 Coloradans die from unintentional poisoning each year (6.6 per 100,000). This is almost seven times the number of drowning deaths and more than 15 times the number of fire/burn deaths (Table D3).1 Alarmingy, the age-adjusted death rate for unintentional poisoning in Colorado has more than tripled from 2.2 per 100,000 in 1980 to 7.3 per 100,000 in 2003 (Table D4). Additionally, an average of 1,169 Coloradans are hospitalized each year for unintentional poisoning (26.7 per 100,000) (Table H3).

Colorado is not the only state with an increasing death rate due to unintentional poisoning. A recent report from the CDC highlighted the increase in unintentional poisoning deaths seen nationally.2 Among U.S. adults, drug over-doses are the largest cause of poisoning deaths. In some states, the use of illicit drugs,

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1. Death tables are found in Appendix A. Hospitalization tables are found in Appendix B.
such as cocaine and heroin, has resulted in the increase in unintentional poisoning deaths, whereas in other states, the misuse of prescription medications has been a more significant contributor. Unintentional drug overdose deaths often are caused by the misuse of multiple drugs, leaving substantial uncertainty about the contribution of each drug to the death.

Although misuse of medications is a significant cause of unintentional poisoning, other agents can cause poisoning as well. The International Classification of Diseases coding system used to categorize hospitalizations and deaths identifies many of the specific agents involved in unintentional poisonings. These agents include such substances as:

- Drugs, such as prescription medications, over-the-counter medications, and “street drugs” (for example, barbiturates, tranquilizers, antidepressants, sedatives, aspirin, acetaminophen, heroin/opiates/narcotics, and psychotropic agents such as LSD and marijuana)
- Exhaust fumes and gases, such as carbon monoxide and nitrous oxide
- Cleaning agents and petroleum products, such as soaps, polishes, solvents and paint
- Acids and caustic alkalies (lye)
- Pesticides and herbicides
- Poisonous plants and food.

Nationally, in 2002 nearly 2.4 million people called a poison control center because of a poisoning incident. In 2003, the Rocky Mountain Poison and Drug Center responded to 46,856 calls on human exposures to poisons in Colorado. The vast majority of those exposures (90 percent) occurred in someone’s residence. Only 2 percent occurred in a work setting and 7 percent happened somewhere other than home or work. Seventy-three percent of people contacting the Rocky Mountain Poison and Drug Center were treated at home or in some other non-health care facility setting. Another 21 percent were sent to a hospital or other health care facility for treatment.

The Colorado death and hospitalization rates presented in this chapter only include those cases specifically categorized as “unintentional” using the *International Classification of Diseases* coding system. In addition to poisonings known to be unintentional, a number of deaths and hospitalizations occur each year from poisoning of “undetermined intent.” The classification of “undetermined intent” is assigned to cases where there is no clear evidence that the poisoning was intentional (suicide or homicide) or unintentional. On average, each year in Colorado, there are 70 deaths from poisoning of undetermined intent, in addition to the 310 deaths due to unintentional poisoning and the 168 deaths resulting from poisoning-related suicide. In addition to the 1,169 hospitalizations for unintentional poisoning and 2,107 hospitalizations for poisoning-related suicide attempts, each year an average of 315 individuals are hospitalized for poisoning of undetermined intent. It is likely that some of the poisoning deaths and hospitalizations of undetermined intent were actually unintentional and would add to the numbers reported in this chapter; however, currently, there is no method to accurately estimate the percent of poisonings of undetermined intent that could be assigned to the intentional and unintentional categories.
Deaths

From 1980 to 2003, the age-adjusted death rate for unintentional poisoning in Colorado more than tripled from 2.2 per 100,000 to 7.3 per 100,000 (Table D4). Rates have particularly increased since 1992. The increase in the age-adjusted death rate is primarily due to increasing rates for individuals ages 35-44 and 45-54.

Unintentional poisoning is among the leading causes of injury death for Coloradans ages 15-84 (Table D18). More specifically, unintentional poisoning by drug overdose is among the top five detailed causes of injury deaths among adults ages 15-64 (Table D19).

Overall, the age-adjusted death rate for unintentional poisoning for men is twice the rate for women. This gender difference is even more striking for specific types of unintentional poisoning. Men are 3.3 times more likely to die from overdoses of narcotics (such as heroin, cocaine and methadone) or hallucinogens (such as LSD) than women. Men are also five times more likely to die from carbon monoxide and other gas poisoning than are women (Table D22).
The death rate for unintentional poisoning is highest for males ages 35-44 (19.4 per 100,000). The highest rate for females is also seen in this age group (9.1 per 100,000) (Tables D9, D10).

Based on a 10-year annual average (1994-2003), the age-adjusted mortality rate for deaths due to unintentional poisoning is significantly higher for Hispanics (7.7 per 100,000) and Blacks (10.2 per 100,000) than for whites (4.5 per 100,000). Among race/gender groups, the age-adjusted mortality rate for deaths due to unintentional poisoning is highest for Black males (14.8 per 100,000).

Almost 74 percent of all deaths due to unintentional poisoning occur outside a hospital setting; that is, the person did not have the benefit of inpatient medical care prior to death (Table D20).

![Figure 71: Unintentional poisoning death rates by age and sex](image)

*Fewer than three deaths in this age/gender group.

![Figure 72: Age-adjusted unintentional poisoning death rates by race/ethnicity, with 95 percent confidence intervals](image)

The lines on the bars indicate the possible error in the estimate of the rate. The longer the line, the more variation there may be in the rate. For more information on confidence intervals, please see Appendix D: Technical Notes.
Hospitalizations

Causes and rates of unintentional poisoning hospitalizations vary greatly by age and sex. While the majority of calls to poison control centers involve children under age 6, the majority of hospitalizations involve adults.

On average, 1,169 Coloradans are hospitalized each year for unintentional poisoning (26.7 per 100,000) (Table H3). Unintentional poisoning is among the top five causes of injury hospitalization for all age groups except ages 5-24 (Table H11).

In the last several years, there has been an increase in the reported number of hospitalizations involving several specific types of poisons. The number of hospitalizations for unintentional poisoning due to heroin/opiates/narcotics increased from 94 admissions in 1996 to 258 admissions in 2003. The number of hospitalizations for unintentional poisoning due to tranquilizers increased from 117 admissions in 1996 to 176 admissions in 2003. During this same time period, the number of hospitalizations for unintentional poisoning due to aspirin or barbiturates has remained relatively stable at approximately 38 admissions for aspirin poisoning and approximately 18 admissions for barbiturate poisoning each year (Table H15).

“A Colorado State University freshman died of a lethal mix of alcohol, methadone and tranquilizers... the official cause of his death was listed as intoxication with ethanol and methadone. The manner of death was ruled accidental.”

The Rocky Mountain News, 12/30/04
Males and females are about equally likely to be hospitalized for unintentional poisoning but for different types of agents. Men are more likely than women to be hospitalized for alcohol overdose, while women are more likely than men to be hospitalized for overdoses due to heroin/opiates/narcotics, aspirin or tranquilizers (Table H16).

Children ages 5-14 are the age group least likely to be hospitalized for unintentional poisoning. Hospitalization rates increase in late adolescence and remain high throughout life, although the causes differ for younger and older adults. Younger adults ages 15-54 are more likely to be hospitalized for alcohol poisoning and for poisoning due to psychotropic agents such as marijuana, LSD and antidepressants. Unintentional poisoning due to drug use continues into later adulthood when a higher percent of hospitalizations result from overdoses of heroin/opiates/narcotics and tranquilizers. For adults ages 75 and older, prescription drug misuse and drug interactions become more common (Table H17).

Six counties, Denver, El Paso, Fremont, Mesa, Pitkin, and Pueblo, have age-adjusted unintentional poisoning hospitalization rates that are significantly higher than the state rate. Twenty-two counties scattered across the state have hospitalization rates significantly lower than the state rate (Table H18).

Figure 74: Age-adjusted unintentional poisoning hospitalization rates by county of residence, 2001-2003

Data for Broomfield County are for 2003 only.
Childhood unintentional poisoning

Although the vast majority of unintentional poisoning deaths and hospitalizations in Colorado involve adults, children are also at risk. Each year, approximately 120 children ages 0-14 are hospitalized and one or two die from unintentional poisoning. Approximately 73 percent of the children hospitalized for unintentional poisoning in Colorado are less than 5 years old. The hospitalization rate for this age group (27.6 per 100,000) is significantly higher than for children ages 5-14 (5.2 per 100,000).

Nationwide, the majority of human exposure cases identified through poison control centers involve children less than 6 years old (52 percent), with children ages 6-12 accounting for an additional 7 percent. Nationally, in 2003, the most common poison exposures for children were cosmetics and personal care products, cleaning substances, analgesics, foreign bodies and topical agents.6

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Colorado Child Fatality Review Committee

Although unintentional poisoning deaths in children are rare, over the years, the Colorado Child Fatality Review Committee has identified several deaths that involve a common scenario: an infant or young child who has a cold or is acting “fussy” is treated with an adult-strength medication (over-the-counter or prescription). Due to differences in physiology, medications may behave differently in children than in adults. The Colorado Child Fatality Review Committee’s medical experts recommend consultation with a health care professional before considering giving an adult-strength medication to a child.

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A closer look at carbon monoxide poisoning

Carbon monoxide (CO) is a colorless, odorless, poisonous gas produced by the incomplete burning of solid, liquid, and gaseous fuels. Appliances fueled with natural gas, liquified petroleum gas, oil, kerosene, coal, charcoal or wood may produce carbon monoxide. Car motors in operation also produce carbon monoxide.\(^7\)

Nationally, 480 individuals die each year from unintentional non-fire-related CO poisoning. In addition, an estimated 15,200 individuals with confirmed or possible non-fire-related CO exposure or poisoning are treated annually in U.S. hospital emergency departments. CO exposures and poisonings occur more often during the fall and winter, when people are more likely to use gas furnaces, heaters and generators in their homes.\(^8\)

In Colorado, an average of nine individuals die each year from unintentional non-fire-related CO poisoning. The majority of these individuals (93 percent) are male. In addition to deaths, an average of 26 Coloradans are hospitalized for unintentional CO poisoning each year. Hospitalization rates are similar for males and females (Table H16). The majority of hospitalizations involve individuals ages 35-74 (53 percent), however 16 percent of hospitalizations involve children less than 5 years old.

The majority of carbon monoxide poisonings resulting in hospitalization occur in the home (65 percent). One-fifth of the cases resulted from motor vehicle exhaust fumes.

“A man was accused of child abuse after two of his daughters suffered from carbon monoxide poisoning during a 45 minute ride in the back of a pickup... [The father] had removed several feet of his truck’s tailpipe, allowing fumes to move easily under the truck’s bed. He then put his daughters in the back of the truck, enclosed by a camper shell with its windows closed, for the ride that left the girls unconscious from the fumes...”

The Boulder Daily Camera, 5/01

Unintentional poisoning can be prevented

Nationally, childhood poisoning deaths have declined over the last two decades due to effective prevention strategies, including child-resistant packaging, reduction in the use and availability of certain medications, product reformulations, better medical care, and interventions by poison control centers.9, 10, 11

Health agencies and safety advocates can assist in prevention by participating in community coalitions that promote the following strategies:

- Encourage age-appropriate poison prevention counseling by primary care providers. Adults should be counselled on the safe use of prescription drugs and the risks of illicit drug use.
- Work with alcohol and drug abuse agencies to promote healthy lifestyles and the avoidance of substance abuse.
- Promote the poison control center phone number in Colorado. The Rocky Mountain Poison and Drug Center number is 1-800-222-1222.
- Public awareness and education messages should include:
  - Keep the phone number of the regional poison control center near the phone.
  - Use child resistant packaging.
  - Dispose of old medications properly.
  - Store medications, alcohol, pesticides and cleaning products properly and use cabinet locks.
  - Read product labels and follow all directions carefully.
- Encourage strategies to prevent carbon monoxide poisoning:
  - Install carbon monoxide detectors near bedrooms and on each floor of the home.
  - Inspect furnaces, fireplaces, wood-burning stoves, and fuel-burning appliances annually.

Teach about the dangers of leaving a car engine running in an attached enclosed garage.

Educate about the dangers of using gasoline-powered tools and engines indoors.

For more information

- The Injury and Suicide Prevention Program at the Colorado Department of Public Health and Environment at www.cdphe.state.co.us/pp/injuryprevention/injuryprevhom.asp
- Centers for Disease Control and Prevention, National Center for Injury Prevention and Control at www.cdc.gov/ncipc/
- Substance Abuse and Mental Health Services Administration at www.samhsa.gov/index.aspx
- The Rocky Mountain Poison and Drug Center at www.rmpdc.org
- American Association of Poison Control Centers at www.aapcc.org
- National SAFE KIDS Campaign at www.safekids.org/
- Poison Prevention Week at www.poisonprevention.org
- Home Safety Council at www.homesafetycouncil.org
- Children’s Health Topics from the American Academy of Pediatrics at www.aap.org
- Risk Watch educational curriculum at www.riskwatch.org
- National Safety Council at www.nsc.org

Figure 75: Healthy People 2010 Objective 15-8 Reduce deaths caused by poisonings

Deaths per 100,000 population

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Based on ICD-10 codes X40-X49, X60-X69, X85-X90, Y10-Y19, and Y35.2. Includes unintentional and intentional (suicide/homicide) poisonings and poisoning of undetermined intent.