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## Unintentional Poisoning Deaths in Colorado, 2000-2010

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### Introduction

Deaths due to unintentional injury are becoming a public health concern across the United States as well as in Colorado. In 2008, unintentional injury was the 5th leading cause of death in the United States<sup>1</sup> and it was the 4th leading cause of death in Colorado in 2010.

Poisoning became the leading cause of injury death in the U.S. in 2008, and for the first time in at least 20 years, exceeded the number of deaths from motor vehicle accidents.<sup>2</sup> A similar occurrence is also taking place in Colorado. The age-adjusted mortality rate for motor vehicle accidents significantly decreased from 16.8 deaths per 100,000 population in 2000 to 9.5 in 2010. However the age-adjusted mortality rates for unintentional poisoning have significantly increased over the past 11 years, almost doubling to 10.8 deaths per 100,000 population in 2010.

Currently there are national and state initiatives to decrease the burden of unintentional injuries. The Healthy People 2020 initiative has written multiple objectives around the prevention of unintentional poisoning deaths.<sup>3</sup> Injury prevention has also been identified as one of Colorado's Winnable Battles, which are the state's key public health and environmental issues where progress can be made over a five-year time period.<sup>4</sup> The intent of this report is to bring awareness to the issue of unintentional poisoning and to better understand which Colorado populations are at increased risk for death. This information can also help state and local agencies to decrease the burden of injury death and to further prevention efforts.

### Methods

Data analyzed for this report are derived from death certificates and come from the Vital Statistics Unit in the Health Statistics Section at the Colorado Department of Public Health and Environment. Data were limited to deaths among Colorado residents only.

Deaths were identified as due to unintentional poisoning by selecting death records with specific underlying cause of death codes. The International Classification of Diseases 10th Revision<sup>5</sup>

(ICD-10) codes X40-X49 were used to identify which deaths were accidental or unintentional (See Table in Appendix for detailed list of codes). Deaths due to intentional poisoning or poisoning of undetermined intent are not included in this report.

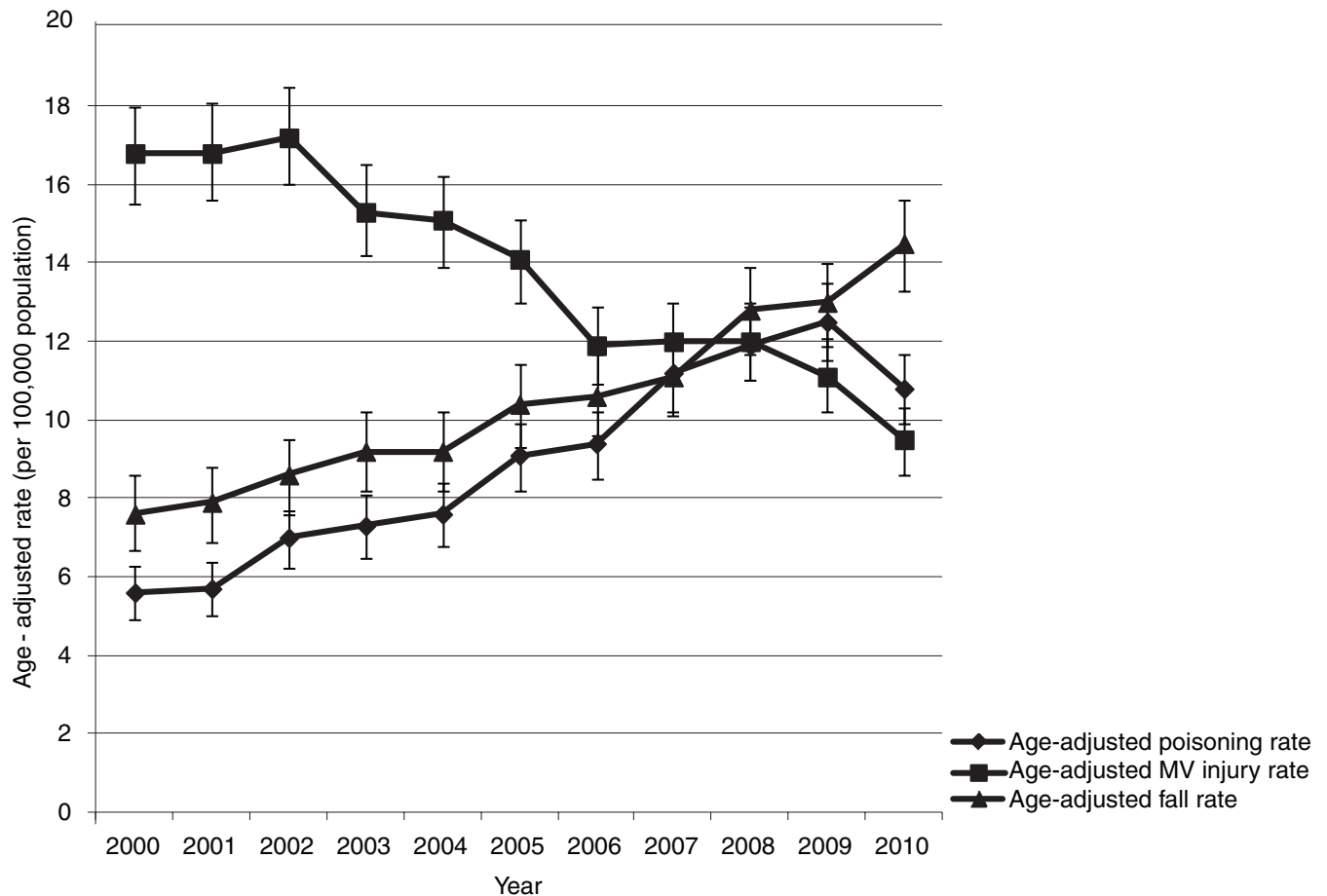
Data were analyzed by trend, injury type, gender, age, race/ethnicity and poisoning substance type. Ninety-five percent (95%) confidence intervals were calculated in order to assess statistically significant differences between selected groups. Statistically significant differences between rates can be determined by whether the confidence intervals of the rates overlap (not statistically significant) or do not overlap (statistically significant).

## Results

### Unintentional Injury Deaths

The age-adjusted rates for common unintentional injury deaths are compared in Figure 1. Deaths resulting from motor vehicle accidents over the past 11 years have significantly decreased from 16.8 to 9.5 deaths per 100,000 population. However, for both fall and poisoning injury deaths, the age-adjusted rates increased over the past decade. Starting in 2008, the mortality rates from falls and unintentional poisoning rose above the rate for motor vehicle accidents, with the fall mortality rate being significantly higher in 2010.

Figure 1. Age-adjusted mortality rates by unintentional injury: Colorado residents, 2000-2010.



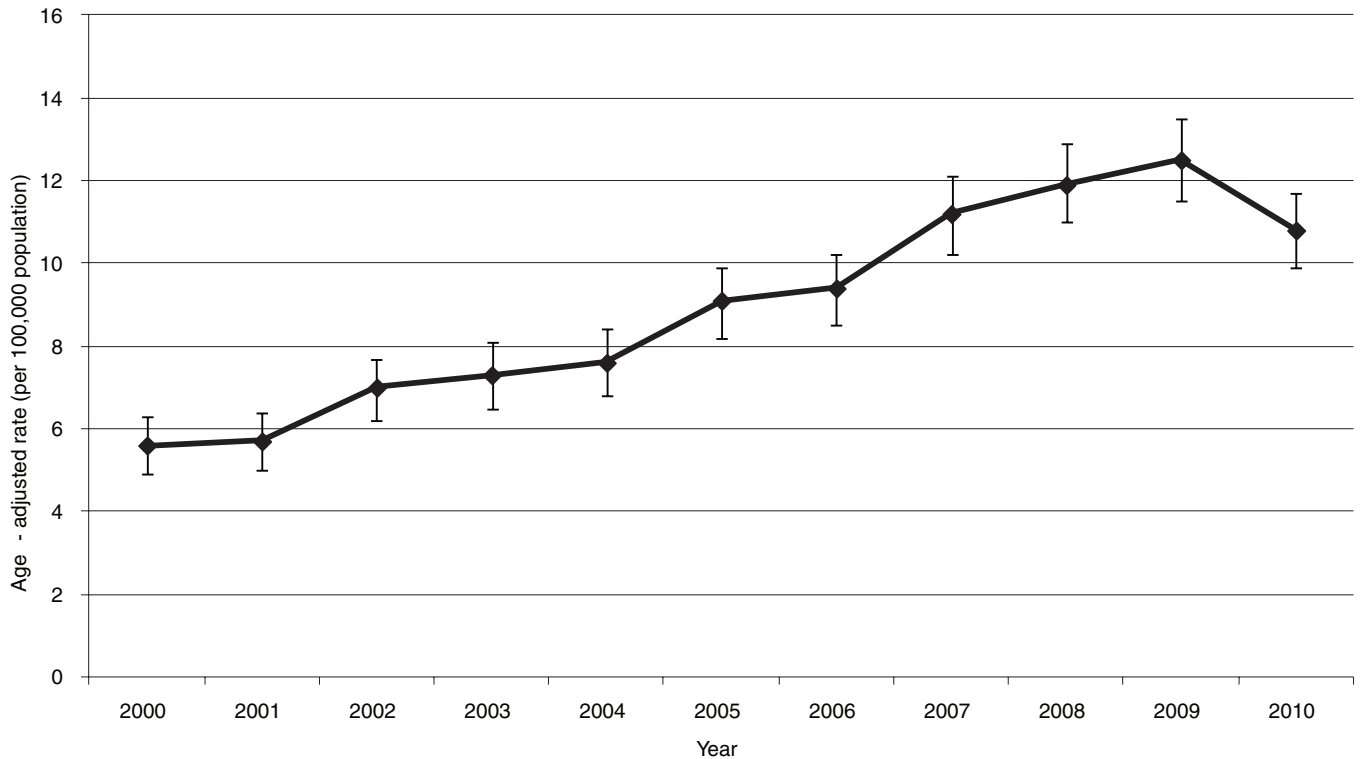
Error bars represent the 95% confidence interval of the age-adjusted rate.  
Source: Health Statistics Section, Colorado Department of Public Health and Environment.

### Unintentional Poisoning Deaths

Unintentional injury deaths due to poisoning have risen steadily over the past decade. The age-adjusted rate has almost doubled from 5.6 to 10.8 deaths per 100,000 population from 2000 to

2010. A slight decline in poisoning deaths (12.5 to 10.8 deaths per 100,000 population) is observed from 2009-2010; however this difference is not statistically significant (Figure 2).

**Figure 2. Age-adjusted mortality rates for unintentional poisoning: Colorado residents, 2000-2010.**



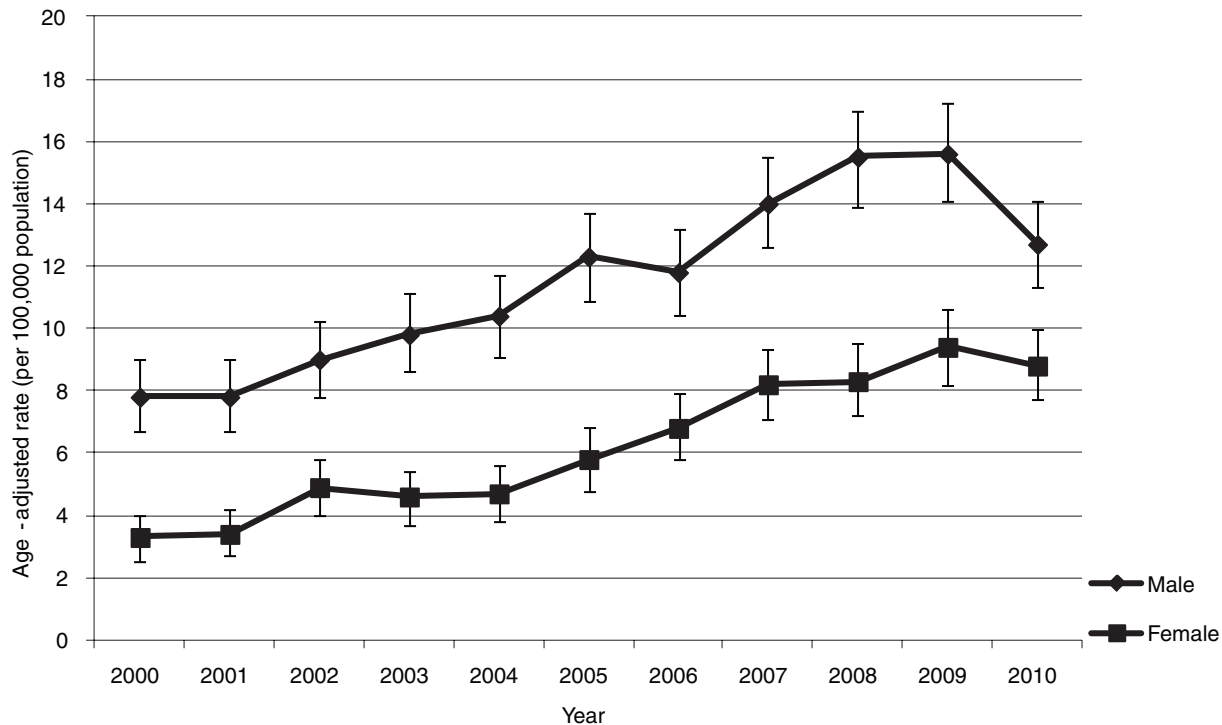
Error bars represent the 95% confidence interval of the aged-adjusted rate.  
Source: Health Statistics Section, Colorado Department of Public Health and Environment.

### Gender

Unintentional poisoning mortality rates for males were significantly higher than female rates over the past decade. The age-adjusted rate for males rose from 7.8 in 2000 to 12.7 deaths

per 100,000 population in 2010. While the male age-adjusted mortality rates were significantly higher than the female rates, the rate for females nearly tripled from 3.3 in 2000 to 8.8 deaths per 100,000 population in 2010 (Figure 3).

Figure 3. Age-adjusted mortality rates for unintentional poisoning by gender: Colorado residents, 2000-2010.



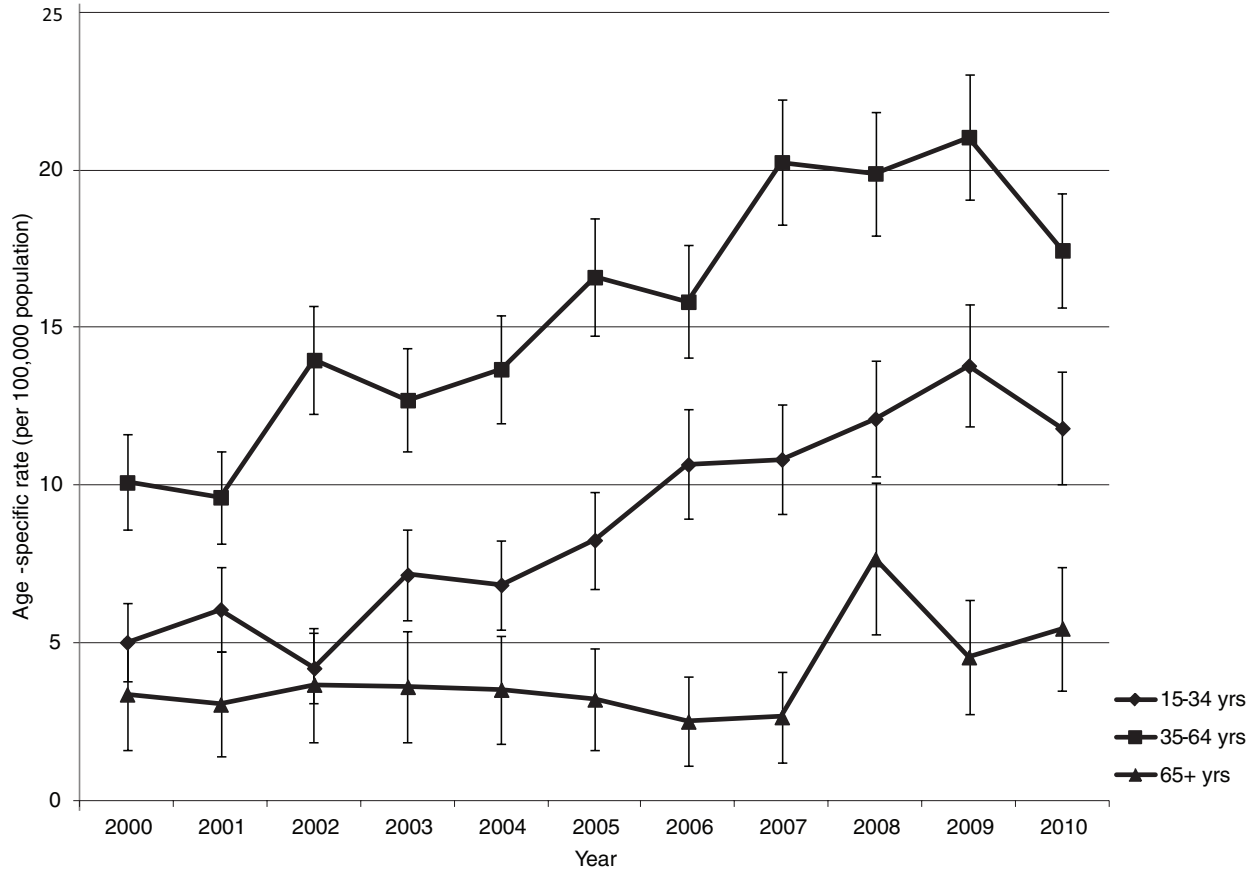
Error bars represent the 95% confidence interval of the age-adjusted rate.  
 Source: Health Statistics Section, Colorado Department of Public Health and Environment.

### Age

Age-specific mortality rates for unintentional poisonings demonstrate a relationship with age. Adults ages 35-64 years had significantly higher poisoning mortality rates compared to those younger (15-34 years) and older (65+ years). Older adults (65+ years) were the only age group that did not experi-

ence a significant change in mortality rates from 2000 to 2010. The mortality rate more than doubled for people ages 15-34 years from 2000 to 2010 (5.0 to 11.8 deaths per 100,000 population, respectively). Similarly, adults ages 35-64 years experienced a significant increase from 10.1 to 17.5 deaths per 100,000 population over the same 11-year period (Figure 4).

Figure 4. Age-specific mortality rates for unintentional poisoning: Colorado residents, 2000-2010.



Error bars represent the 95% confidence interval of the age-specific rate.  
 Source: Health Statistics Section, Colorado Department of Public Health and Environment.

### Race/Ethnicity

Table 1 displays the mortality rate for unintentional poisonings by race and ethnicity for aggregated years 2006-2010. The mortality rate for the Black/African American population (15.3 deaths per 100,000 population) is significantly higher than the

rates for other races and the total population (11.2 deaths per 100,000 population). This differs from the trend reported for mortality by all unintentional injuries in Colorado, where the Black/African American population is significantly less than the total population (data not shown).

Table 1. Age-adjusted mortality rates for unintentional poisoning by race/ethnicity: Colorado residents, 2006-2010.

Race/Ethnicity	Unintentional Poisoning Injury Deaths	
	Age-Adjusted Rate	95% Confidence Interval
Black/African American	15.3	(14.4-16.1)
American Indian/Native Alaskan	12.5	(11.2-13.9)
White, non-Hispanic	11.5	(11.3-11.7)
White, Hispanic	11.0	(10.7-11.4)
Asian American/Pacific Islander	1.7	(1.4-2.0)
<b>Total</b>	<b>11.2</b>	<b>(11.0-11.3)</b>

Source: Health Statistics Section, Colorado Department of Public Health and Environment.

## Substance Type

Unintentional poisoning death rates are shown for aggregated years 2006-2010 by substance type in Table 2. The death rate of accidental poisoning by narcotics and psychodysleptics

(4.95 deaths per 100,000 population) was significantly higher than all the other substance type classifications.

**Table 2. Age-adjusted mortality rates for unintentional poisoning by substance type: Colorado residents, 2006-2010.**

Accidental Poisoning Substance Type*	Age-Adjusted Rate	95% Confidence Interval
Narcotics and psychodysleptics	4.95	(4.84-5.05)
Other drugs, medicaments and biological substances not specified into classifications	4.16	(4.06-4.25)
Alcohol	0.91	(0.87-0.96)
Antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs	0.64	(0.60-0.68)
Other gases and vapours	0.33	(0.31-0.36)
Nonopioid analgesics, antipyretics and antirheumatics	0.10	(0.08-0.11)
Other and unspecified chemicals and noxious substances	0.07	(0.06-0.08)
Organic solvents and halogenated hydrocarbons and vapors	0.02	(0.01-0.03)

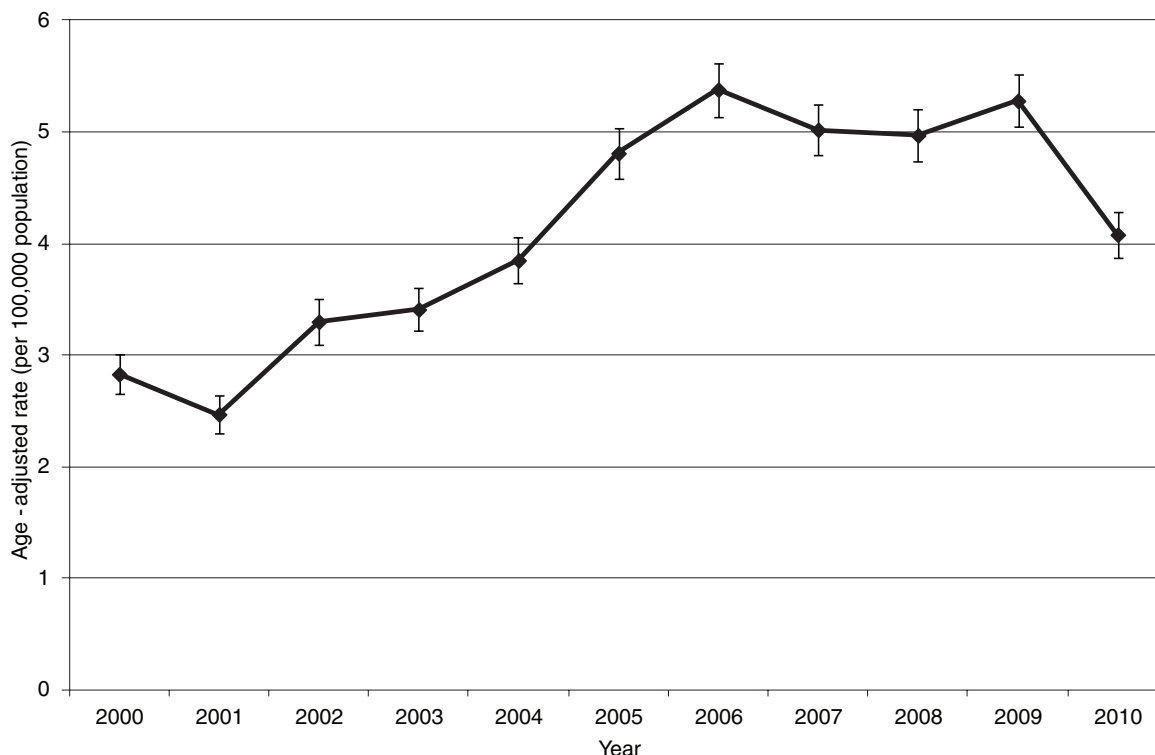
\*See Table in Appendix for detailed list of codes.

Source: Health Statistics Section, Colorado Department of Public Health and Environment.

The unintentional poisoning mortality rates from 2000 to 2010 for narcotics and psychodysleptics demonstrates a significant increase from 2.8 to 4.1 deaths per 100,000 population. While the increase in rates between 2000 and 2010 is significant, the

2010 rate showed the first significant decline in unintentional deaths from exposure to narcotics/psychodysleptics since 2005 (Figure 5).

**Figure 5. Age-adjusted mortality rates for unintentional poisoning by narcotics and psychodysleptics:\* Colorado residents, 2000-2010.**



\*Accidental poisoning by narcotic and psychodysleptic drugs includes cannabis, cocaine, codeine, heroin, lysergide (LSD), methadone, morphine and opium.<sup>5</sup>

Error bars represent the 95% confidence interval of the age-specific rate.

Source: Health Statistics Section, Colorado Department of Public Health and Environment.

## Discussion

Over the past decade the mortality rate from unintentional poisoning increased, and now exceeds the rate for motor vehicle accidents, which had been the leading cause of unintentional injury in Colorado. The population groups with the highest unintentional poisoning death rates were males, people ages 35-64 years, and Black/African Americans. Narcotics and psychodysleptics were the drugs involved in the most unintentional poisoning deaths.

While we know cases described in this report were accidental, we cannot make any assumptions about the circumstances that led to the fatal exposure. We know that since case definitions for this analysis did not include intentional or undetermined underlying causes of death, cases of suicide were not included in the report and therefore did not contribute to the increasing mortality rates.

In the United States there has been an increase in illicit drug use of both prescription and illegal drugs.<sup>6</sup> There may also be increased rates of drug abuse in Colorado which are contributing to the mortality rates reported in the data. The case definition for these data can include cases of drug abuse, but must be interpreted with caution. The intent of the exposure that resulted in death strongly influences the intent classifica-

tion on the death certificate. Therefore, drug abuse cases can be classified into any of three categories; accidental, intentional or undetermined (the latter two intent classifications were not analyzed in this report).

A decrease in the overall mortality rate for unintentional poisoning occurred from 2009-2010. While the decrease was not statistically significant, the same trend was observed in the gender, age, and racial/ethnic analyses. The observed overall decrease may have been influenced by the significant decrease observed for the same time period in the analysis by narcotics and psychodysleptics. Additional years of data are necessary in order to determine if the observed decrease is the beginning of a trend or due to chance.

The findings of this report increase awareness of a growing public health issue about unintentional poisoning death in Colorado. They also prompt research questions that will need to be further explored in order to achieve a more complete understanding of this type of injury. The knowledge from this report can be applied towards programming, setting future objectives, identifying barriers, influencing policy and creating community collaboration to achieve fewer deaths from unintentional poisoning.

**Appendix**  
**Table of Accidental Poisoning by and Exposure to Noxious Substances<sup>5</sup>**

<b>ICD-10 Code</b>	<b>Name</b>
X40	Accidental poisoning by nonopioid analgesics, antipyretics and antirheumatics
X41	Accidental poisoning by antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs
X42	Accidental poisoning by narcotics and psychodysleptics
X43	Accidental poisoning by and exposure to other drugs acting on the autonomic nervous system
X44	Accidental poisoning by other and unspecified drugs, medicaments and biological substances
X45	Accidental poisoning by and exposure to alcohol
X46	Accidental poisoning by organic solvents and halogenated hydrocarbons and vapors
X47	Accidental poisoning by and exposure to other gases and vapours
X48	Accidental poisoning by and exposure to pesticides
X49	Accidental poisoning by and exposure to other and unspecified chemicals and noxious substances

**References**

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