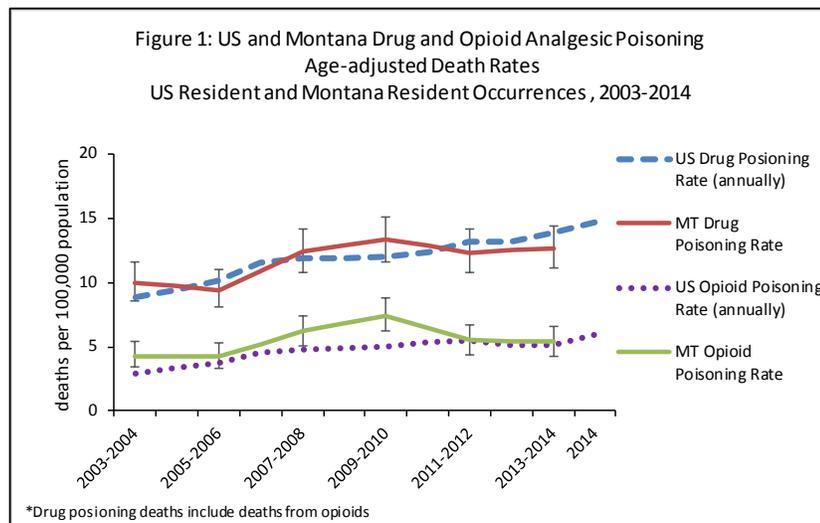


April, 2016

**AT A GLANCE**

- Drug poisonings are the third leading cause of injury deaths in Montana, after motor vehicle accidents and suicides.
- The number of deaths mentioning opioid analgesics has declined since peaking in 2009-10.
- Decedents between 35 and 44 years of age have the highest rate of drug poisoning deaths in Montana.

Drug poisonings are the third leading cause of injury deaths in Montana, accounting for 1,334 deaths between 2003 and 2014, after motor vehicle accidents (n=2,685) and suicides (n=2,522). Drug poisoning deaths from prescription opioid analgesics have received much attention throughout the United States, although in recent years, opioid analgesic deaths have leveled nationally while drug poisoning deaths from heroin and methamphetamine have increased.<sup>1,2,3,4,5</sup> Montana’s drug poisoning rates have been similar to the US rate during the past 12 years with a rate of 12.6, in 2013-2014, compared to the national rate of 14.3 deaths per 100,000.<sup>6</sup> Montana deaths from opioid analgesics peaked in 2009-10, but have since declined to 5.4, just below the US rate of 5.5 deaths per 100,000 for the past four years (Figure 1).<sup>7</sup> This report examines drug poisoning deaths, demographics, and the contributions of both licit and illicit drug deaths in Montana from 2003-2014.



**Methods**

Data used in this report from the Montana Office of Vital Records were restricted to drug poisoning deaths in Montana residents who died in Montana. The Montana Office of Vital Records also receives data on deaths to Montana residents who die out of state but, information on decedents who died in another jurisdiction may be incomplete; often only the underlying cause of death is reported. As a consequence, national studies reporting state-level information may differ from the numbers and rates report in this publication.

Drug poisoning deaths were defined as having an ICD-10 underlying cause of death code of X40-X44 (unintentional poisoning), X60-X64 (suicide), X85

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(homicide), or Y10-Y14 (undetermined intent).<sup>8</sup> Among deaths with an underlying cause of death of drug poisoning, ICD-10 codes indicating the specific types of drugs involved were ascertained in the accompanying multiple cause of death fields.<sup>9,10</sup>

In this manner, frequency and rates are calculated separately for each drug of interest mentioned on the death certificate. Because certifying physicians may list more than one drug on the death certificate, summing counts of specific drug deaths may exceed the total number of poisoning deaths reported. Opioid analgesics were defined as having ICD-10 codes of T40.2, T40.3, or T40.4. Age-adjusted death rates were calculated using the direct method using the 2000 US standard population.<sup>11</sup> Rates were not calculated for events with fewer than 20 observations. A total of 1,334 during the time interval 2003-2014 by two-year intervals deaths were included in this analysis.

## Results

The age-adjusted death rates for males were consistently higher than for females until 2007 when this trend reversed (Table 1). Rates have since equalized to 12.5 and 12.8 deaths per 100,000 for males and females respectively.

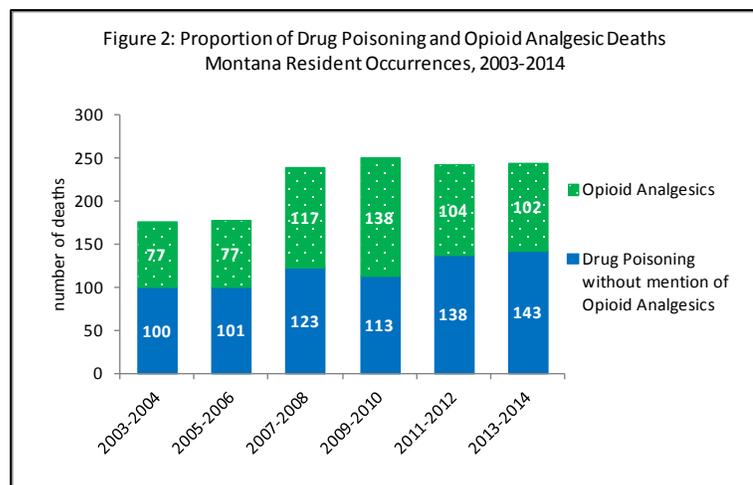
The death rates for whites have averaged just over 11.0 deaths per 100,000 since 2003 whereas the average rate for American Indians/Alaska Natives was 23.0 deaths.

Death rates to decedents less than 35 or older than 65 years of age remained relatively unchanged during the study period. Rates for decedents between 35 and 44 years and 45 to 54 years of age averaged the highest with 3.9 and 3.1 deaths per 100,000, respectively. During the past four years, the death rate for decedents between the ages of 35 and 64 years increased an average of 13.4% while death rates decreased for all other age groups.

Rates from drug poisonings of undetermined intent remained nearly unchanged while unintentional poisoning deaths have decreased 5.8% from 8.2 to 7.3 deaths per 100,000. Deaths from suicides increased 20.8% from 1.9 to 2.9 deaths per 100,000 during the past four years.

When examining specific drugs using the multiple-cause approach, codeine, morphine, and other opioids (T40.2), tricyclic and tetracyclic antidepressants (T43.0), and methadone (T40.3) were the drugs mentioned most frequently on the death certificate. Deaths mentioning the illicit drugs heroin or cocaine happened very infrequently during the study period (Table 2).

Overall, deaths where opioid analgesics were mentioned represented the greatest burden of drug poisoning deaths in Montana (Figure 2). Deaths



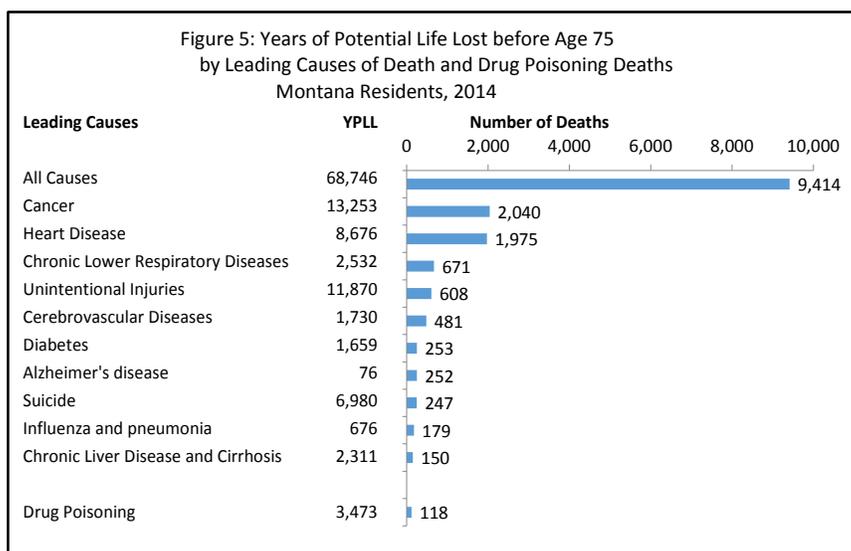
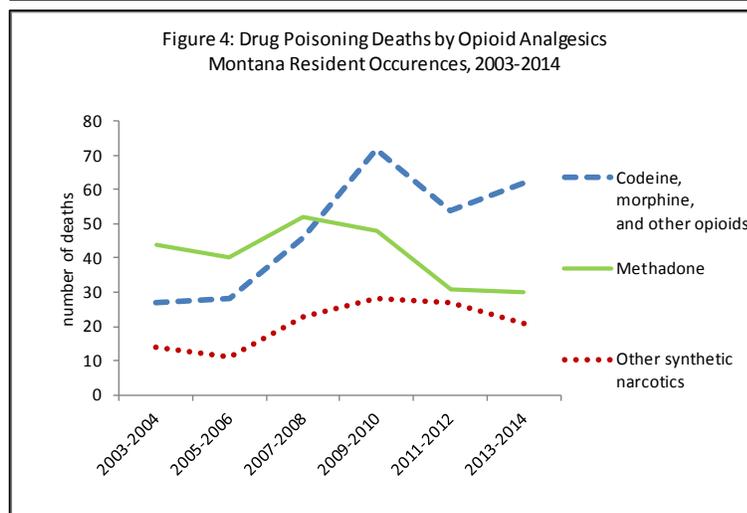
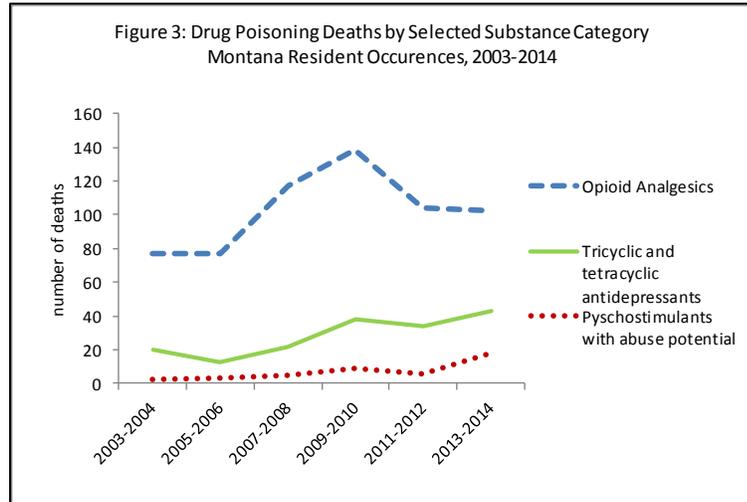
with tricyclic and tetracyclic antidepressants were mostly stable for the first half of the study period but increased slightly since 2008. The drug category psychostimulants with abuse potential (T43.6) contains the amphetamines and methamphetamines. Deaths mentioning psychostimulants increased the most during the last four years although, overall, they are the least mentioned of any of the licit drug deaths (Table 2).

After peaking in 2009-10, deaths mentioning opioid analgesics have declined while the number of deaths mentioning tricyclic and tetracyclic antidepressants and psychostimulants with abuse potential have increased (Figure 3). Methadone and the synthetic narcotics have contributed the most to the decline in deaths mentioning opioid analgesics. Despite the overall decrease in opioid analgesic deaths, the reduction is balanced by the increase of the “other opioids,” the category containing the prescription drugs morphine, oxycodone, hydrocodone, and other similar opioid derivatives (Figure 4).

### Discussion

Drug poisoning deaths continue to be a challenging problem to address in Montana and the United States but, in terms of their contribution to Montana’s overall mortality, drug poisoning deaths accounted for only 118 out of 9,414 deaths or a little more than 1% of all deaths in 2014. Expressed in terms of years of potential life lost, drug poisoning deaths accounted for 3,473 total years of life lost in 2014—an average of 30.5 years per decedent (Figure 5).

The overall burden of drug mortality in Montana did not change during the study period and Montana did not





differ from the United States (Figure 1). Unlike the US and other Western States, Montana has not experienced a large increase in the number drug poisoning deaths due to heroin.<sup>1</sup>

Despite the usefulness of death certificates providing drug poisoning data, they have some limitations. ICD-10 only lists the illicit drugs, opium, heroin, and cocaine and codes drugs based on classification rather than by name—with the exception of T40.2, methadone.<sup>12</sup> While the Montana Office of Vital Records has access to the text fields on its own death certificates, data analysis was restricted to the underlying and multiple causes of death codes in order to maintain comparability in reporting rates with other drug poisoning publications. The death certificate does not represent a complete medical record and its content may vary by certifying physician and to the extent they document the event.<sup>13,14,15</sup> Autopsies are not routinely performed on all decedents nor are all findings available at the time the death is certified. In this study only 58% (n=770) of deaths attributed to drug poisoning received an autopsy and only 17% (n=127) of those deaths were certified prior to the availability of findings related to determining the cause of death.

Similar studies have reported regional differences in the patterns of drug poisoning deaths and have suggested custom tailoring prevention approaches as a possible solution.<sup>12,16</sup> While geographical patterns may exist in Montana, the relatively small number of events makes interpreting trends and patterns in subpopulations difficult. Differences in the rate of opioid poisoning deaths were recently reported for adults enrolled Montana's Medicaid program compared to those not enrolled in Medicaid.<sup>17</sup> Washington State recently reported success in reducing opioid deaths using a comprehensive “state-delivered” approach involving policy makers, state agencies, healthcare organizations, and leaders in the field of pain management.<sup>18</sup> Determining the source of this success and applying a similar strategy to other commonly abused drugs may finally slow and reduce the number of all drug poisoning deaths.



Table 1: Number and Age-adjusted Rates of Drug Poisoning Deaths by Selected Characteristics and Intent  
Montana Resident Occurrences, 2003-2014

Sex	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014
	Num (Rate)					
Male	91 (10.4)	104 (11.1)	130 (13.5)	131 (14.0)	116 (11.6)	121 (12.5)
Female	86 ( 9.7)	74 ( 7.7)	110 (11.3)	120 (12.4)	127 (13.0)	124 (12.8)
<b>Race</b>						
White	156 (9.4)	155 ( 8.9)	216 (12.1)	212 (12.2)	212 (11.7)	215 (12.0)
AI/AN	19 †	22 (17.4)	23 (19.6)	37 (32.5)	27 (22.0)	27 (23.3)
<b>Age in years</b>						
24 and fewer	11 †	25 (1.4)	19 †	23 (1.3)	22 (1.2)	20 (1.1)
25 - 34	30 (2.0)	27 (1.7)	43 (2.5)	46 (2.6)	43 (2.3)	40 (2.1)
35 - 44	68 (4.3)	45 (3.0)	52 (3.6)	65 (4.7)	50 (3.6)	60 (4.2)
45 -54	47 (2.1)	51 (2.3)	89 (3.9)	77 (3.5)	68 (3.2)	70 (3.6)
55 - 64	11 †	22 (0.8)	27 (0.9)	29 (0.9)	38 (1.1)	43 (1.3)
65 and older	10 †	8 †	10 †	11 †	22 (0.9)	12 †
<b>Intent</b>						
Unintentional	90 (5.1)	99 (5.4)	151 (7.9)	148 (7.9)	158 (8.2)	140 (7.3)
Suicide	39 (2.2)	45 (2.3)	56 (2.8)	62 (3.1)	40 (1.9)	58 (2.9)
Undetermined	47 (2.7)	34 (1.8)	33 (1.7)	41 (2.2)	45 (2.3)	47 (2.4)

† Figure does not meet standards of reliability or precision.

Table 2: Number of Drug Poisoning Deaths by Drug Type Mentioned.  
Montana Resident Occurrences, 2003-2014

ICD-10 Code	Substance	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014
T40.1	Heroin	2	1	4	0	3	5
T40.2	Codeine, morphine, and other opioids	27	28	46	72	54	62
T40.3	Methadone	44	40	52	48	31	30
T40.4	Other synthetic narcotics	14	11	23	28	27	21
T40.5	Cocaine	2	4	3	3	2	1
T42.4	Benzodiazepines	3	9	7	12	12	12
T43.0	Tricyclic and tetracyclic antidepressants	20	13	22	38	34	43
T43.2	Other and unspecified antidepressants	6	4	8	17	17	17
T43.6	Psychostimulants with abuse potential	2	3	5	9	6	18
T50.9	Other and unspecified drugs	130	118	149	159	158	148

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