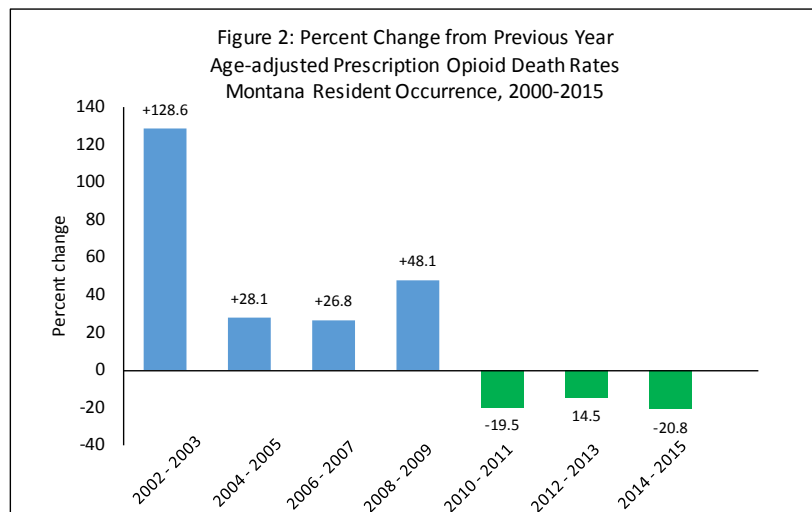
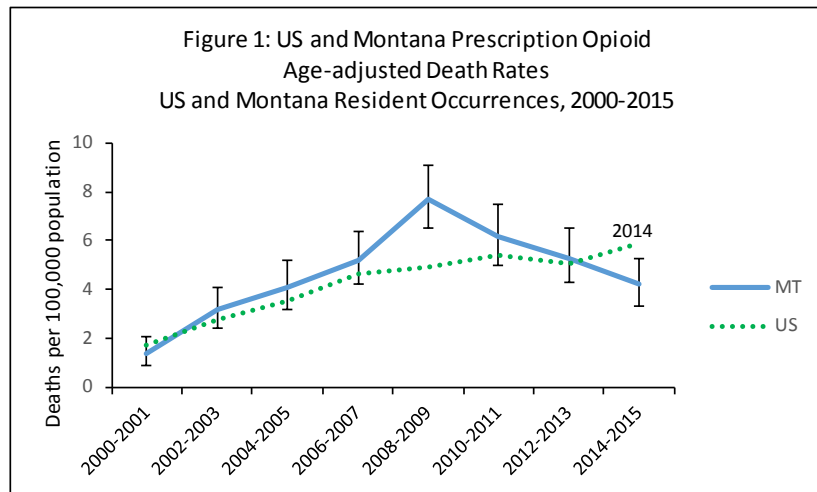


Introduction

AT A GLANCE

- The absolute number of deaths from opioid analgesics in 2015 was 35, the lowest in nearly 15 years.
- The age-adjusted death rate for opioid analgesics has decreased an average of 18% per year during the past six years in Montana.
- More outreach is needed to ensure complete opioid and drug related reporting on death certificates.

Between 2000 and 2015, 693 deaths in Montana were attributed to prescription opioid poisoning. Montana’s prescription opioid poisoning rates have been similar to US rates during the past 16 years, with a rate of 4.2, in 2014-2015, compared to the national rate of 5.1 deaths per 100,000 (Figure 1).¹ The percent change in age-adjusted death rates in Montana have continued to decline during the past six years with a 20.8% decrease between 2010-2011 and 2014-2015 (Figure 2). In contrast to the improvements in Montana’s drug and prescription opioid poisoning rates, US rates continue to increase.^{2,3} This report examines prescription opioid deaths, demographics, and the contributions of other licit and illicit drug deaths in Montana from 2000-2015.



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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 by drug poisoning), X85 (homicide by drug poisoning), or Y10-Y14 (undetermined intent by drug poisoning).⁴ Among deaths with an underlying cause of death of drug poisoning, ICD-10 codes indicating opioids and other specific types of drugs involved were ascertained from the accompanying multiple cause of death fields.

Prescription 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.⁵ Rates were not calculated for events with fewer than 20 observations. A total of 693 deaths during the time interval 2000-2015 by two-year intervals were included in this analysis.

Results


The age-adjusted death rates for males were consistently higher than for females during most of the study period but recently, rates have nearly equalized to 4.2 and 4.1 deaths per 100,000 in 2014-2015 for males and females respectively (Table 1).

Differences in rates between whites and American Indians/Alaska Natives (AI/AN) could not be determined due to the small number of events occurring in the AI/AN population. Rates for whites, the most populous racial group in Montana, closely mirrored the state rates in all year groups.

Death rates were highest for decedents between 25 and 54 years of age, with the higher rate alternating between the 35-44 and 45-54 age groups during the past 12 years. In terms of absolute numbers, most recently deaths in persons between 25 and 64 years of age appear similar.

When examining for the presence of other drugs mentioned in prescription opioid deaths, benzodiazepines (n=51), tricyclic and tetracyclic antidepressants (n=31), other and unspecified antidepressants (n=22), and psychostimulants with abuse potential (n=17) were most frequently mentioned during the entire 2000-2015 study period (Table 2).

Deaths involving codeine, morphine, and other opioids (T40.2) decreased the most from 65 to 45 deaths between 2012-2013 and 2014-2015. Deaths involving methadone (T40.3) and other synthetic narcotics (T40.4) changed little during the same four year period (Figure 3).



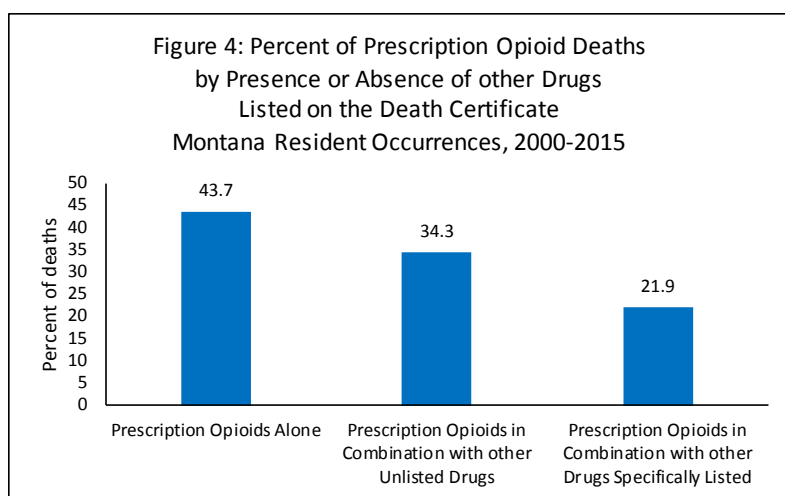
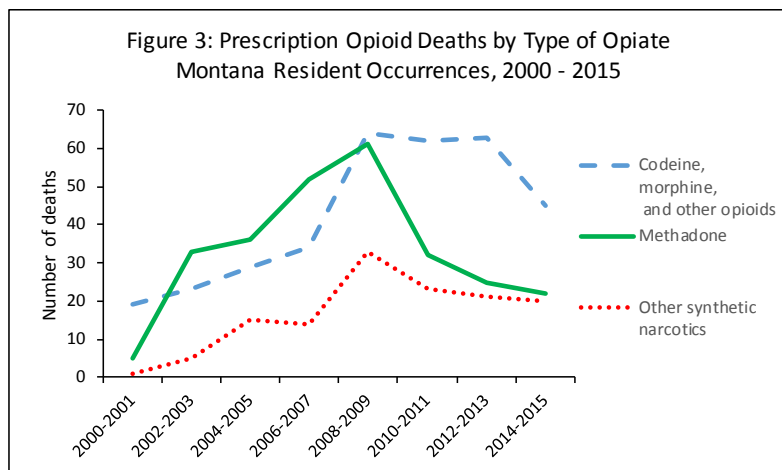
Discussion


Prescription opioid poisoning deaths have continued to decline over the past six years but remain a difficult problem to address both in Montana and the United States. In terms of their economic burden, opioid analgesic deaths have been estimated to cost \$33,664 per death (2011 dollars).⁶ Applying this figure to the most recent two year interval, deaths from prescription opioids cost Montana an estimated \$1.4 million dollars per year.

The overall burden of prescription opioid deaths did not change over the study period and Montana did not differ from the United States. About 1 in 5 opioid analgesic deaths mention at least one additional drug listed in Table 2. While studies have identified increases in combined drug overdoses involving prescription opioids and benzodiazepines, the relatively few poly-drug related opioid deaths make interpreting trends difficult.^{2,7}

The sudden and continued decrease in prescription opioid deaths that followed 2008-2009, may be due to changes that occurred at both the national and state level. In 2009, the U.S. Food and Drug Administration (FDA) partnered with several federal agencies to educate providers on the safe use of methadone, reduce harm in prescribing medications like opioids, and develop prescription disposal guidelines.⁸ In 2010, Montana began “Operation Medicine Cabinet”, a prescription drug drop-off program, which now has nearly 50 permanent drop off sites around the state.⁹ By 2012, Montana’s Prescription Drug Registry became operational, allowing providers and pharmacies to improve patient safety and monitor for signs of abuse/misuse or diversion.¹⁰ Throughout this time, the FDA has mandated changes to prescription opioid formulations to deter abuse, required labelling changes, enhanced its outreach to providers, and improved its communication with the public regarding the dangers of opioid abuse.⁸

Despite the usefulness of death certificates providing opioid poisoning data, they have some limitations. 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.^{11,12} Autopsies are not routinely performed on all decedents. In this study only 64% (n=428) of deaths attributed to prescription opioid poisoning received an autopsy. Adding to the difficulty in ascertaining the presence of other substances in prescription opioid deaths, the death certificate may not specify each of the drugs involved in the poisoning death. For example, 34.5% of death certificates where opioids were mentioned, indicated one





or more other drugs involved but failed to specifically list the substance—either by name or category (Figure 4).

Comprehensive approaches in reducing prescription opioid poisoning deaths have been successful in other western states and Montana has adopted several of their components.^{13,14,15} To completely address all drug poisonings, including those from opioids, more attention is needed in completing the death certificate to ensure that all drugs involved in the death are documented, not just the primary agent. This issue is not unique to Montana. The National Association of Medical Examiners has outlined strategies to improve the surveillance of drug-related deaths.^{16,17} Only by continuing to evaluate existing programs and apply those most effective, will Montana be able to maintain and further reduce the number of prescription opioid deaths.



Table 1: Number of Prescription Opioid Poisoning Deaths by Selected Characteristics and Intent, Montana Resident Occurrences, 2000-2015.

‡ Figure does not meet standards of reliability or precision.

	2000 - 2001		2002 - 2003		2004 - 2005		2006 - 2007		2008 - 2009		2010 - 2011		2012 - 2013		2014 - 2015	
	Num	Rate	Num	Rate	Num	Rate	Num	Rate	Num	Rate	Num	Rate	Num	Rate	Num	Rate
Total																
Total Opioid Deaths	25	1.4	56	3.2	76	4.1	97	5.2	146	7.7	112	6.2	100	5.3	81	4.2
Sex																
Male	13	‡	30	3.4	42	4.5	62	6.6	81	8.7	57	6.1	55	5.7	40	4.2
Female	12	‡	26	2.9	34	3.7	35	3.7	65	6.6	55	6.2	45	4.8	41	4.1
Race																
White	23	1.4	28	3.6	63	5.0	85	5.0	129	7.4	94	5.6	91	5.3	73	4.1
AI/AN	2	‡	8	‡	13	‡	11	‡	16	‡	17	‡	8	‡	5	‡
Age in years																
24 and fewer	2	‡	4	‡	9	‡	14	‡	14	‡	13	‡	10	‡	7	‡
25 - 34	5	‡	13	‡	5	‡	21	1.3	25	1.4	26	1.4	21	1.1	14	‡
35 - 44	11	‡	18	‡	27	1.8	21	1.4	36	2.5	36	2.6	20	1.4	22	1.5
45 - 54	6	‡	18	‡	27	1.2	33	1.5	59	2.6	21	1.0	38	1.9	19	‡
55 - 64	1	‡	3	‡	6	‡	6	‡	10	‡	14	‡	9	‡	16	‡
65 and older	0	‡	0	‡	2	‡	2	‡	2	‡	2	‡	2	‡	3	‡
Intent																
Unintentional	14	‡	30	1.7	52	2.8	66	3.5	118	6.3	77	4.3	75	3.9	55	2.8
Suicide	2	‡	8	‡	11	‡	14	‡	14	‡	14	‡	6	‡	5	‡
Undetermined	9	‡	16	‡	13	‡	17	‡	14	‡	21	1.1	19	‡	21	1.1

Table 2: Number and Type of Drug Mentioned with Prescription Opioid Deaths, Montana Resident Occurrences, 2000-2015

‡ Figure does not meet standards of reliability or precision.

ICD-10 Code	Substance	2000 - 2001	2002 - 2003	2004 - 2005	2006 - 2007	2008 - 2009	2010 - 2011	2012 - 2013	2014 - 2015
T40.1	Heroin	0	0	1	1	0	0	0	2
T40.5	Cocaine	0	1	0	3	0	1	0	0
T42.4	Benzodiazepines	4	4	0	10	8	8	10	7
T43.0	Tricyclic and tetracyclic antidepressants	2	3	1	3	3	5	5	0
T43.2	Other and unspecified antidepressants	0	0	3	1	8	3	7	9
T43.6	Psychostimulants with abuse potential	0	0	1	1	1	2	2	10
T50.9	Other and unspecified drugs	15	39	35	44	69	55	51	43

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