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Suicide in Montana: Evidence from Death Certificates 2004-2013

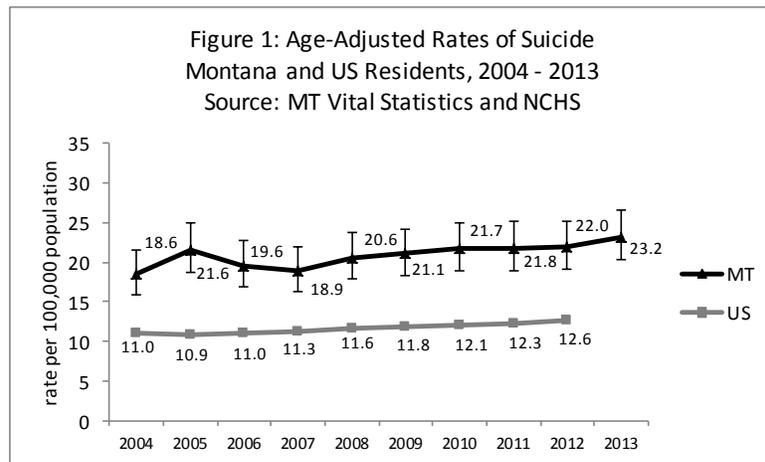
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Introduction

Suicide is a severe and persistent health problem in Montana. Between 2004 and 2013, 2,094 Montana residents died by suicide—an average of slightly more than one death every other day.¹ Montana’s age-adjusted rate has increased from 18.6 deaths from suicide in 2004 to 23.2 deaths per 100,000 population in 2013 while the US age-adjusted suicide rate increased from 11.0 deaths in 2004 to 12.6 deaths per 100,000 in 2012 (Figure 1). The seriousness of this issue led the state to create the Montana Suicide Review Team in 2013 in an effort to create a better understanding of suicide deaths in the state and to recommend public health prevention strategies.² This report summarizes suicide deaths and associated characteristics described on Montana resident death certificates indicating suicide as the underlying cause of death from 2004 to 2013.

Characteristics

The median age of persons who died by suicide is much younger than those who died from all other causes, 45 and 79 years, respectively (data not shown). In Montana, the unadjusted suicide rate peaked at 29.4 deaths per 100,000 in the 25-44 years old age group (Table 1), whereas the US rate is highest in the 45-64 years old group at 17.6 deaths per 100,000 (data not shown).³ Overall, the average unadjusted suicide rate for Montana is nearly twice the US rate for each of the listed age groups.



¹ Montana Department of Public Health and Human Services. 2013 Montana Vital Statistics Annual Report. Available at: <http://dphhs.mt.gov/publichealth/Epidemiology/OESS-VS>

² Montana Code Annotated 53-21-1107. Available at: <http://leg.mt.gov/bills/mca/53/21/53-21-1107.htm>

³ Center for Disease Control and Prevention, National Center for Health Statistics. Underlying Cause of Death 1999-2013 on CDC WONDER Accessed at: <https://wonder.cdc.gov/ucd-icd10.html> on Feb 3, 2015

Between 2004 and 2013, the suicide rate of males was nearly four times the rate of females. Suicide rates were slightly higher in American Indians/Alaska Natives (AI/AN) compared to whites. Decedents with less than a high school education died by suicide at twice the rate as those attended some college or college graduates. The suicide rate for decedents who were divorced is over three times the rate of those who were married (Table 1).

US comparisons are similar with respect to the difference in rates between men and women, whereas rates for whites and AI/AN's are nearly the same. Suicide rates among Montana's AI/AN population are statistically unstable due to the relatively small number of events. However, for the years 2004-2013, the average AI/AN rate was 27.7 [23.6-33.0] while the rate for whites was 20.3 [19.4-21.3]. The only age group to experience a decrease in suicide rates during the study period was for residents 65 and older. Educational attainment also differs with decedents having a high school education dying by suicide at nearly twice the rate as those with some college or a college graduate.⁴ Data on marital status was not available.

Table 1: Number and Rate* of Suicides by Selected Characteristics Montana 2004-2013
Source: MT Vital Statistics

| Characteristics | Number | Rate |
|---|--------|------|
| Age group in years | | |
| 0 -14 | 23 | 1.3 |
| 15-24 | 289 | 20.9 |
| 25-44 | 687 | 29.4 |
| 45-64 | 752 | 27.1 |
| 65 and greater | 343 | 24 |
| Sex | | |
| Male | 1668 | 34.1 |
| Female | 426 | 8.8 |
| Race | | |
| White | 1893 | 21.2 |
| AI/AN | 181 | 26.7 |
| Other | 20 | 13.2 |
| Educational attainment[†] | | |
| Less than high school graduate | 231 | 49 |
| High school graduate or equivalency | 719 | 33.5 |
| Some college or college graduate | 819 | 21.2 |
| Marital Status[‡] | | |
| Single, Never Married | 661 | 32.6 |
| Married (including separated) | 739 | 17.2 |
| Widowed | 139 | 28.2 |
| Divorced or Separated | 519 | 54.2 |

*Unadjusted suicide rates per 100,000 population

[†]Decedents ≤ 25 years

[‡]Decedents ≤ 15 years

⁴ Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report. Suicides-United States, 2005-2009; 62 (3) Supplement:179-183.

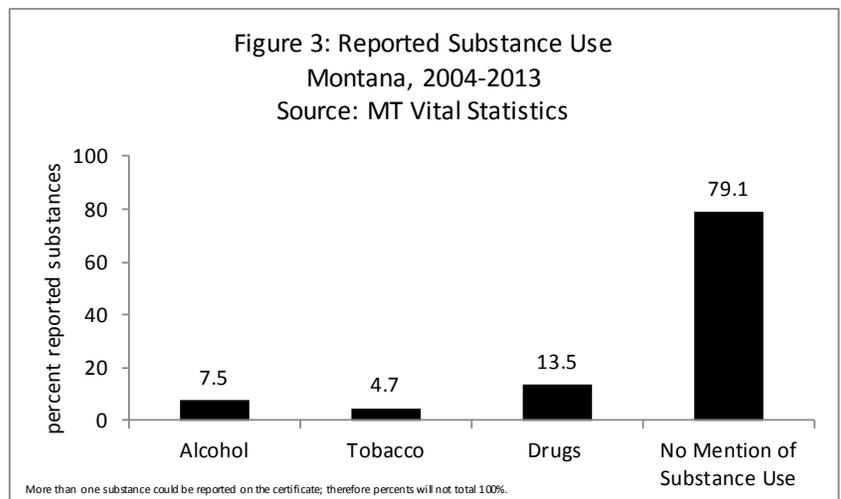
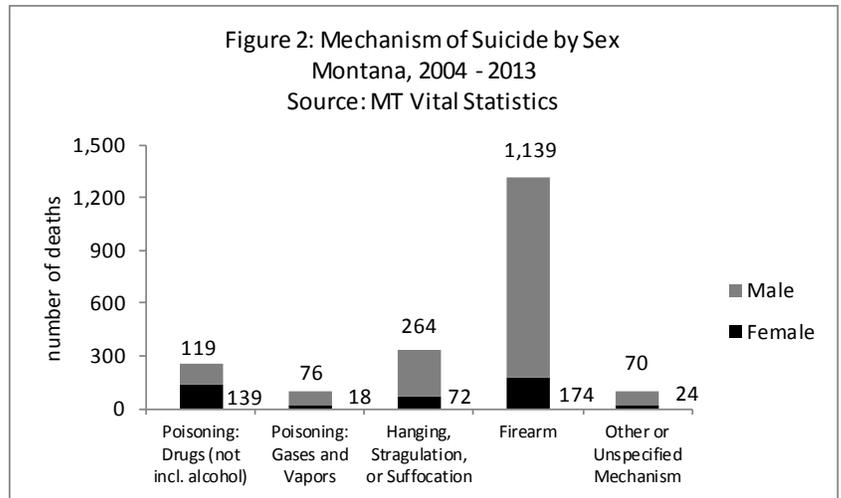
Mechanism

Firearms were the most common mechanism of suicide in Montana followed by hanging, strangulation, or suffocation, drugs, gases and vapors, and other or unspecified mechanism. Females died more often by drugs and less often by hanging, strangulation, or suffocation than males, while both sexes died from firearms, gases and vapor, and other mechanisms in about the same frequency (Figure 3).

Substance Use and Mental Health

The Montana Certificate of Death contains text fields containing “literals” which are used by the National Center for Health Statistics to assign cause of death codes. The content of these fields is dependent of the information recorded by the certifier and the absence of information does not mean the decedent did not have a condition rather it is missing data and should be treated as such.⁵ Substance use was determined using both an underlying (ICD codes)⁶ and multiple (literals)⁷ cause of death approach and combined as an alcohol, tobacco, or drug-related death. Drugs, both prescription and recreational, were the most frequently reported substance on the death certificate followed by alcohol and tobacco, while nearly 80% of the certificates did not mention substance use (Figure 4).

Using the same approach, 438 suicides mentioned one or more mental or behavioral disorders. Mood disorders and disorders related to psychoactive substance use were most frequently recorded category with 323 and 172 deaths, respectively (data not shown). More than one substance or mental or behavioral disorder could be recorded for each death.



⁵ Custis, C. and Schwartz, B. Reading the Literals: Searching for Expressions in the Text on Death Certificates in Montana, 2003-2010. Montana Department of Health and Human Services. 2012.

⁶ Center for Disease Control and Prevention. National Center for Health Statistics. Deaths: Final Data for 2007. 2010; 58 (19).

⁷ Center for Disease Control and Prevention. Morbidity and Mortality Weekly Report. Vital Signs: Overdoses of Prescription Opioid Pain Relievers and Other Drugs Among Women - United States, 1999-2010. 62(26):537-542.

Discussion

The death certificate tells us a number of characteristics about those who died by suicide but it is far from the ideal tool for collecting information about these deaths and much has been written on the limited adequacy of death certificates to ascertain and understand suicides.⁸ Furthermore, the death certificate only captures those who complete suicide—a fraction of the true public health burden. In 2010, the Montana Behavioral Risk Factor Surveillance reported that 4.4% [95% confidence interval 3.6-5.2%] of Montana adults seriously considered suicide and of those who considered it, 11.5% [6.8-18.8%] made one or more attempts.⁹ Application of these proportions to Montana's adult population means that about 3,700 Montanans attempted suicide in that year while, according to the death certificate, 227 completed suicide.

By law, the death certificate must be filed within ten days of death, leaving little time for an investigation of all the fact that may have led to the suicide. While a death certificate may mention substance use, nearly 75% of suicides are filed without the benefit of an autopsy despite research suggesting that alcohol,¹⁰ tobacco,¹¹ and drug¹² use may play a role in suicides. Mental health also seems to play a role in the opinions of some certifiers but death certificates are no substitute for a psychological history prepared by a licensed mental health professional.

Overall, Montana's suicide rate continues to increase and has remained at nearly twice the US rate during the past decade. There is still much to learn about this type of premature death and its prevention. Montana's suicide problem is not unique. High rates of suicide are long-time phenomenon in the Western United States and explanations for these regional variations remains mixed.¹³ Nock et al. suggest expanding epidemiological research to examine synergistic effects among modifiable risk and protective factors rather than continuing to focus on patterns and correlates of prevalence.¹⁴ Perhaps using new approaches combined with state-led efforts like Montana's Suicide Review Team will lead to a better understanding of suicide behavior and begin to decrease this significant loss of life.

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⁸ Rockett I, Kapusta N, and Bhandari R. Suicide Misclassification in an International Context: Revisitation and Update. *Suicidology Online* 2011; 2:48-61.

⁹ Montana Department of Public Health and Human Services. Survey Results from the 2010 Behavioral Risk Factor Surveillance System. Available at: <http://brfss.mt.gov>.

¹⁰ Pirkola S, Suominen K, and Isometsa E. Suicide in Alcohol-Dependent Individuals. *CNS Drugs* 2004;18(7):423-436.

¹¹ Huges J. Smoking and Suicide: A Brief Overview. *Drug Alcohol Dependence* 2008;98(3):169-178.

¹² Mino A, Bousquet A, Broers B. Substance Abuse and Drug-Related Death. Suicidal Ideation, and Suicide: A Review. *Crisis* 1999; 20(1): 28-35.

¹³ Centers for Disease Control and Prevention. Morbidity and Mortality Weekly Report. Regional Variations in Suicide Rates—United States, 1990-1994 1997;46 No.34: 789-793.

¹⁴ Nock M, et al. Suicide and Suicide Behavior. *Epidemiologic Reviews* 2008; 30:133-154.
