

July, 2013

**Under-Ascertainment of Alcohol Involvement in Vehicle Crash Deaths
on Montana Death Certificates, 2012**

Cody L. Custis, MS, Hospital Discharge Epidemiologist

Hannah Yang, OESS Intern

Robert Kirkland, OESS Intern

Bruce Schwartz, MA, MPA, Lead Vital Statistics Epidemiologist

Carol Ballew, PhD, Senior Public Health Epidemiologist

Introduction

Information available from the current Montana death certificate (implemented in 2003) includes checkboxes for some details of injury deaths occurring in traffic accidents (was the decedent the driver, passenger, pedestrian, or involved in another way), but does not explicitly elicit any information about alcohol use. Comments about alcohol may be included in one of several narrative sections, but the level of detail in these sections is left to the discretion of the certifiers. The amount of information included varies substantially from certificate to certificate. In the interval 2008-2011, an average of 10.5% of motor vehicle deaths occurring in Montana had any indication of alcohol involvement on the death certificates. In contrast, the Montana Department of Transportation (MDOT) reported alcohol use in 42.5% of motor vehicle deaths for the same years.¹ The MDOT report was based on Fatal Crash Reports (FCRs) completed by the Montana Highway Patrol (MHP).

This report describes our exploration of the discrepancy between the proportions of fatal crashes involving alcohol reported from death certificates and from FCRs. Our initial hypothesis was that alcohol use might be recorded on death certificates only if the decedent was the driver and had been drinking, whereas FCRs would also identify deaths to sober individuals and non-drivers if another person involved in the crash had been drinking.

Methods

The Montana Office of Vital Statistics (OVS) has entered into a data sharing agreement with the MHP to receive copies of FCRs to augment the data available to us about motor vehicle fatalities. OVS staff extracts information from the crash reports that is likely to be pertinent to public health issues and matches FCRs and death certificates using a record linkage routine described in a previous report.²

Beginning in 2012, FCRs include detailed narratives describing the circumstances of crashes. FCRs contain information about the intoxication status of each person involved from a checkbox in the body of the form, and may have information about alcohol use in the narrative as well. This report is based on records from January 1, 2012 through September 30, 2012 (from the implementation of the current version of the FCR form through the last records received by the date of our analysis).

There were 155 crash fatalities identified from the FCR database, and 172 individuals whose underlying cause of death was motor vehicle traffic accident from the OVS death files using the Centers for Disease Control and Prevention's (CDC) external cause of death mortality matrix.³ We did not include crash deaths classified as suicide, homicide, or undetermined intent in the OVS files. We suspect the differing numbers of deaths ascertained from FCRs and death certificates may be due in part to the fact that the Montana OVS data system has death certificates for all residents regardless of where their deaths occurred, while the MHP investigates all fatal crashes that occur in Montana, regardless of where decedents resided. In addition, the FCRs may not include individuals who died after being transported from the scene of the crash for treatment.

¹ MDT Annual Report, http://www.mdt.mt.gov/publications/docs/brochures/safety/hsp_report.pdf; Unpublished Montana Office of Vital Statistics data.

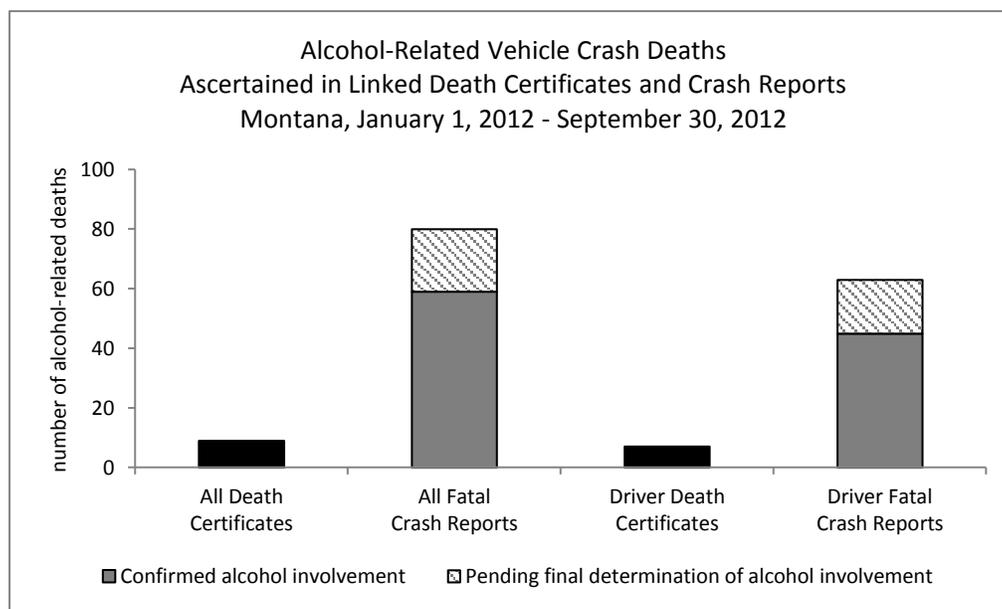
² Custis, C. and Yang, H. Technical Report: Record Linkage Between Montana Highway Patrol and Montana Vital Statistics Data, 2008-2011. Montana Department of Health and Human Services. 2013.

³ http://www.cdc.gov/nchs/data/ice/icd10_transcode.pdf

The linkage routine matched 138 record pairs. Manual review found all 138 pairs to be true matches. Manual review of the remaining 17 fatal crash reports and 34 death certificates did not yield any additional matches. We classified the 138 record pairs as alcohol-related or not according to the criteria of both the FCRs and the death certificates and examined the concordance for alcohol use between the two. If the FCR reported alcohol intoxication as “yes” for any driver, all fatalities from that crash were classified as alcohol-related. If any driver had “pending” status for alcohol intoxication, but no driver had “yes” status, all fatalities were classified as “pending.” When pending cases are resolved, some are found to involve alcohol use while others are not. We were unable to predict the proportion that would ultimately be found to involve alcohol, so we treated the pending cases as a separate category for this analysis. If no driver had either “pending” or “yes” status, fatalities from that crash were classified as not alcohol-related. For death certificates, we considered a motor vehicle traffic death to be alcohol-related if it had any alcohol-attributable ICD-10 code from CDC’s Alcohol-Related Disease Impact website.⁴ We found only eight motor vehicle deaths (6%) with an ICD-10 code for alcohol use. In addition, we searched motor vehicle death certificates for literal expressions reflecting alcohol involvement using methods previously described in another report.⁵ We found one additional alcohol-related death using this method, for a total of nine (7%).

Results

In the FCRs, 59 of 138 fatalities (43%) had confirmed alcohol use for at least one driver, and an additional 21 fatalities (15%) were pending determination for alcohol use (Figure 1).



Because a death certificate focuses on the decedent rather than the circumstances of a crash, it would not be surprising if a death certificate did not capture alcohol use in a case where a decedent was not consuming alcohol, but died in a crash caused by an alcohol-impaired driver. Therefore, we examined alcohol use only among drivers who died. Of 102 drivers, 45 (44%) had confirmed alcohol use recorded in the FCRs, and another 18 were pending determination for alcohol use (18%). However, according to the death certificates, only seven of 102 drivers (7%) had an indication of alcohol use. Death certificates missed at least 38 out of 102 impaired drivers, and perhaps as many as 56 if pending cases are included.

⁴ https://nccd.cdc.gov/dph_ardi/Info/ICDCodes.aspx

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.

Conclusions

Montana death certificates under-ascertained the involvement of alcohol in fatal motor vehicle crashes by a factor of six if only confirmed instances of alcohol use from FCRs were counted, and by a factor of 10 if cases with “pending” status were included. Our analysis did not support our initial hypothesis that the discrepancy might be explained by death certificates identifying only the deaths of drivers as alcohol-impaired deaths. Even when looking only at driver fatalities, death certificates failed to identify a very large proportion of decedents who had been drinking. In order to understand the true magnitude of drunk driving as a public health issue, public health professionals need a comprehensive data source such as the Montana Highway Patrol’s Fatal Crash Reports.

This report leads to two public health recommendations, apart from the obvious one about not drinking and driving. First, analysts need to be aware of the limitations of death records. Although much information can be gleaned from a death certificate, much may also be missing. If ascertainment of a risk factor depends on using the text portions of a death certificate, absence of an indication of that risk factor does not mean “No,” it means “Missing.” The death certificate is the legal record of a death but is not a comprehensive medical record or record of the full circumstances of that death.

Second, linking FCRs to death records on a continuing basis makes additional information available public health and safety professionals without slowing the death certification process. FCRs contain important information that can contribute to public health prevention messaging. Informed use of these two types of reports together has great potential for improving public health and safety planning. For instance, the most frequent locations of motor vehicle crashes and their proximity to existing medical facilities is crucial to the efficient operation of emergency medical services, deployment of existing medical resources, and planning for future resource development.

Acknowledgements

We would like to thank the Montana Highway Patrol for sharing fatal crash reports with the Office of Vital Statistics. We would like to thank Gary Dale, M.D., Medical Examiner for the State of Montana and Mickey Nelson, Coroner for Lewis and Clark County, for reviewing and providing valuable comments on this manuscript.

For more information about Montana Vital Records, please contact
Bruce Schwartz, MA, MPA, Lead Vital Statistics Epidemiologist
at 406-444-1756 or bschwartz@mt.gov

This document was published in electronic form only.

Alternative formats of this document will be provided on request.

Please visit our website at

<https://dphhs.mt.gov/publichealth/Epidemiology/OESS-VS>

