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Economic Costs of Alcohol-Related Vehicle Crashes in Montana

January 2010

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The economic cost of alcohol abuse in Montana impacts all parts of the economy and is estimated to cost the state \$511 million dollars per year (Economic Impact of Alcohol Abuse by Dr. Patrick Barkey, <http://www.bber.umt.edu/health/papers.asp>). These estimates are based on lost work productivity, alcohol treatment costs, and health care costs of alcohol related vehicle fatalities. However, the economic costs of alcohol related vehicle crashes that resulted in injuries in Montana were not included in this \$511 million cost, only those crashes that resulted in death were included. When alcohol related crashes with injuries are included it represents an additional \$131 million bringing the total economic cost of alcohol abuse to \$642 million.

In Montana, an average of 1,700 people are injured in alcohol crashes each year. Bodily harm and life threatening injuries from alcohol related injury crashes account for over 10% of all vehicle crashes in the state, but 20% of all vehicle crashes with injuries in the state.

TRENDS IN CRASH INJURIES

Crash reports on alcohol related vehicle fatalities and non-fatal crashes are reported to the Montana Department of Transportation and compiled into annual data reports. A fatal crash that involves a driver with a blood alcohol concentration (BAC) of .01 or greater is considered an alcohol-related crash. A drug-related fatal crash involves a driver with any amount of an illegal drug (which includes use of inhalants), and/or any amount of a prescription drug that has a known side-effect of causing impairment. Non-fatal crashes are determined to be alcohol- or drug-related by the officer at the scene based on observation of evidence at the crash scene (e.g. open containers, drug paraphernalia) and implementation of standard field sobriety testing (SFST) protocols.

Alcohol related fatalities are included in the crash-with-injury numbers and are reported through the Fatality Analysis Reporting system database. The FARS database uses the results of blood alcohol content tests from Montana Forensics Lab. Non-fatal crashes related to alcohol or reported by the Montana Highway Patrol.

Alcohol/drug-related crashes accounted for 10.5% of all reported traffic crashes during 2008, a proportion that has declined from the 22.3% of all traffic crashes represented by alcohol crashes in 1983. These alcohol/drug-related crashes tend to result in more severe injuries than do crashes with no impairment. During the early 1980s, crash injuries related to alcohol accounted for as much as 36% of total crashes with injuries. In 2008 alcohol/drug related injuries were at 19.4% of all injuries. This is only slightly lower than in 2007 which had the highest percentage since the early 1990's. Table 1 below presents the impaired crash counts.

Table 1 Alcohol and Drug Related Vehicle Crashes in Montana: 1999-2008

Alcohol/Drug Related Crashes						
Year	All Crashes			Injuries		
	Alcohol Related	All	Alcohol Related Fatalities	Alcohol Related	All	% of All
1999	2,177	21,078	109	1,771	10,459	16.9%
2000	2,211	22,254	117	1,824	10,798	16.9%
2001	2,035	21,846	104	1,652	8,982	18.4%
2002	2,288	23,527	126	1,745	10,086	17.3%
2003	2,173	23,160	128	1,638	9,632	17.0%
2004	2,113	21,783	106	1,767	9,263	19.1%
2005	2,182	22,373	124	1,623	9,211	17.6%
2006	2,243	22,186	126	1,816	9,470	19.2%
2007	2,273	21,829	124	1,771	9,067	19.5%
2008	2,313	21,971		1,645	8,465	19.4%
Change 1 year	+1.8%	+0.7%		-7.1%	-6.6%	-0.5%
Change 5 years	+5.3%	-1.3%		-4.5%	-9.3%	+5.1%

Source: Montana Department of Transportation – Safety Management System

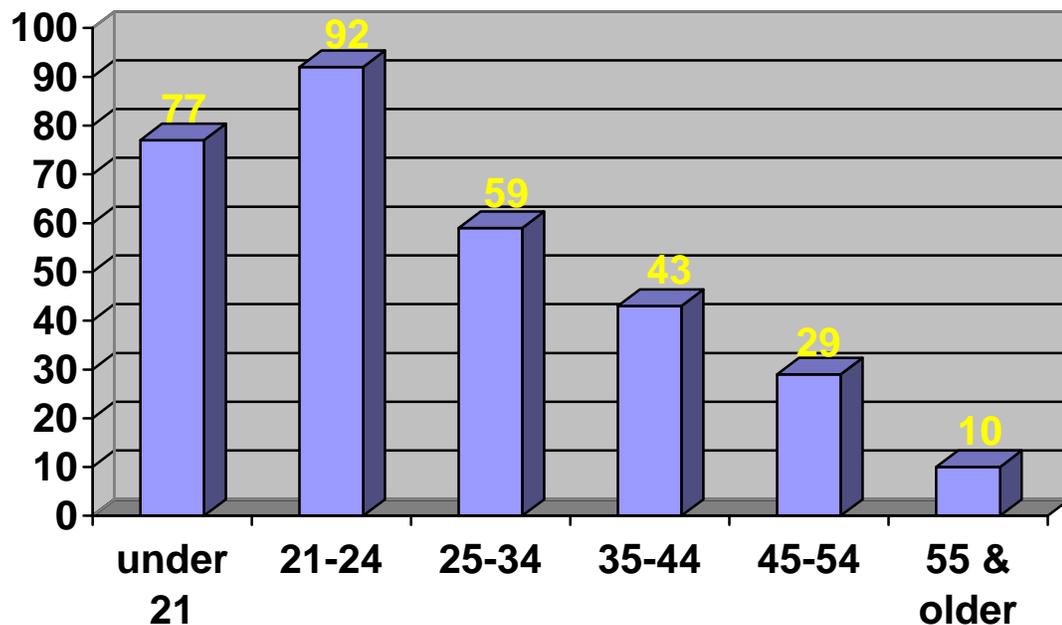
Drinking and driving is the most significant consequence of all substance abuse in Montana, with data from the 2009 Montana Epidemiological Profile of Substance Abuse (<http://montanakidscount.org/Publications/Reports/tabid/188/Default.aspx>) showing that both binge drinking and drinking and driving in Montana are significantly above national rates. Alcohol abuse behavior is especially concentrated in underage youth and the 21 to 29 year old age groups. Binge drinking rates are 35% for high school students, 28% for 18 – 20 year olds and 26% in the 21 – 29 year old age cohort compared to just 12% for all other combined age groups.

The patterns of drinking and driving being concentrated in younger age cohorts are replicated in data on alcohol related crashes by age of driver as shown in Figure 1. Motor vehicle crashes involving alcohol occur across the life span and the age cohort involved in the largest number of fatal alcohol crashes is in the 25 year old and younger age group.

Alcohol crashes for drivers between 21 and 24 years of age is 92 alcohol crashes per 10,000 licensed driver and 77 per 10,000 licensed drivers for drivers under the age of

21 years. The alcohol crash rate drops for drivers 25 years old and higher and continues to drop for each older cohort reaching a low of 10 per 10,000 licensed drivers for the 55 and over group.

Figure 1: Alcohol-Related Crashes by Age of Driver per 10,000 Licenses in Montana: 2007



Source: Montana Department of Transportation

COST OF INJURY CRASHES

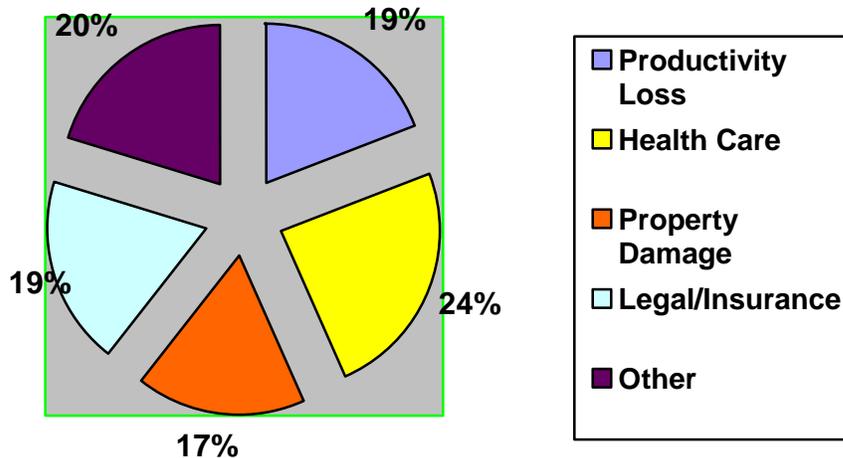
Victims of alcohol-related crashes suffer more severe injuries than victims from crashes not involving alcohol. Higher levels of injury severity impose greater personal costs on victims and their families and higher costs to employers, health care providers, and government agencies. The positive relation between injury severity and costs shows up in a number of studies. Economic cost studies of alcohol crashes with injuries (Miller, et. al. 1998; Miller, et. al. 2006) analyze health care costs, victim's personal work loss, employer's lost worker productivity and absenteeism, and property damage. These costs account for almost 33% of annual highway crash costs even though alcohol crashes represent only about 10% of all crashes.

Montana data shows a similar relationship between alcohol related crashes with injuries and economic costs. Injured victims who survive alcohol crashes suffer severe injuries and spend a number days in the hospital. Montana Trauma Registry Data collected from a cross section of hospitals and emergency medicine providers show that one half of the alcohol crash injuries involve Montanans under the age of 30 and include high

speed rollovers, rear-ending or t-boning another vehicle, or running into power poles, trees, or concrete abutments. The severity of alcohol crash injuries results in hospitalization for crash victims with over half of these hospitalizations lasting 24 days or longer up to extreme cases of 50 days in the hospital.

The economic costs of crashes with injuries have been estimated in a number of studies. If a similar methodology for national cost estimates (Miller, et. al. 2006) and state estimates for Washington (Mueller, et. al. 1998) is applied to Montana data, it shows costs of \$81,000 for each injured survivor of an alcohol-related crash in 2005. This \$81,000 breaks down as health care costs of \$19,500, productivity losses of \$16,000 (both individual earnings loss and employer’s costs), legal and insurance costs of \$15,500 and property damage of \$13,800 are the main cost components. Losses in quality of life make up the remaining \$16,200. Figure 2 shows this breakdown as a percent of total cost.

Figure 2: Components of the Economic Cost of Alcohol Related Crashes with Injuries in Montana: 2005



Source: National data modified for Montana, crash data from Montana Department of Transportation

Applying this average economic cost of \$81,000 to Montana’s 1,623 victims of alcohol crashes with injuries (2004/2005/2006 three year average) yields an annual cost of \$131 million dollars. It is important to remember that this figure does not include the economic cost of alcohol-related vehicle fatalities, those costs are estimated separately and discussed below. However, the cost of alcohol crashes with injuries will vary slightly each year as the total number of alcohol injury crashes vary and as the prices of medical services and other factors increase due to inflation. Also, these victims experience work loss, out of pocket expenses, years lost in quality of life, and the more subjective but equally significant, emotional and traumatic costs of coping after the crash.

ECONOMIC COSTS OF ALL ALCOHOL RELATED VEHICLE CRASHES

Alcohol abuse in Montana has a total economic cost estimated by Barkey (2008) to be \$511 million in 2005. These costs include health care and medical services and forgone productivity and earnings for both the victim and the employer. In the 2008 report, Barkey estimates economic costs of alcohol related crashes with fatalities to be \$96 million. When the \$131 million cost of alcohol related crashes with injuries is added to this \$511 million it brings the total cost to \$642 million.

The combined cost of alcohol related vehicle crashes with both injures and fatalities represent a little over one third of the \$642 million total costs of alcohol abuse (Table 2). These costs occur every year and accrue to individual victims and their families, employers, health care and emergency service providers, and taxpayers. Moreover, Montana's price tag of \$642 million due to alcohol abuse and drinking and driving is spread over all 56 counties in the state.

Table 2: Economic Costs of Alcohol Abuse including Crashes with Injuries (2005)

Sources of Costs	Economic Costs	% of Total Costs
Crashes with Injuries	\$131 Million	20%
Crashes with Fatalities	\$96 Million	15%
Other Costs of Alcohol Abuse	\$415 Million	65%
Total Costs of Alcohol Abuse	\$642 Million	100%

COST IMPACTS IN MONTANA COUNTIES

The \$642 million dollars in alcohol abuse costs are borne by all Montanans from all socio-economic levels and no matter if they live in rural or urban areas. They are borne by local and county governments as well as the dollars lost to the state economy because of the consequences of alcohol abuse. The costs are the financial ones and do not include the toll on families and communities in psychological and human suffering.

It is possible to geographically distribute Montana's alcohol abuse cost over counties using county level data on alcohol related vehicle crashes with fatalities and with injuries. Alcohol crash data by county is a strong, leading indicator of where binge and heavy drinking and drinking and driving are major problems. The county patterns of alcohol abuse are spread all over the state in rural and urban counties alike.

Table 3 shows the total costs of alcohol abuse by county in Montana for the 2005 data. Counties are subdivided into counties currently involved in environmental prevention strategies under Montana's federally funded Strategic Prevention Framework State Incentive Grant (SPF SIG). This is being implemented at the community level through the Montana Community Change Project (MTCCP) which operates in 19 counties throughout the state.

TABLE 3: County Shares of Montana's \$642 Million Alcohol Abuse Costs: 2005

	TOTAL COSTS	COSTS PER CAPITA BASED ON COUNTY POPULATION
<u>MONTANA COMMUNITY CHANGE COUNTIES</u>		
Beaverhead	\$6,902,195	\$784
Blaine	\$3,738,689	\$571
Dawson	\$5,272,510	\$616
Deer Lodge	\$3,546,961	\$401
Glacier	\$10,353,293	\$774
Hill	\$11,407,795	\$689
Jefferson	\$9,011,199	\$810
Lake	\$27,704,644	\$974
Lincoln	\$11,311,931	\$599
Madison	\$7,573,242	\$1,020
Mineral	\$5,080,782	\$1,304
Phillips	\$2,684,187	\$680
Powell	\$3,259,370	\$458
Richland	\$8,148,425	\$887
Roosevelt	\$8,819,471	\$869
Sanders	\$9,682,246	\$878
Sheridan	\$2,780,051	\$824
Silver Bow	\$13,900,254	\$426
Wibaux	\$1,150,366	\$1,281
<i>Sub-Total</i>	\$152,327,609	\$723
<i>Share of Total Cost</i>	24%	
<i>Share of State Population</i>	22%	
<u>ALL OTHER COUNTIES</u>		
Big Horn	\$8,915,335	\$697
Broadwater	\$3,930,417	\$856
Carbon	\$10,640,884	\$1,095
Carter	\$191,728	\$151
Cascade	\$51,287,143	\$627
Chouteau	\$1,821,413	\$347
Custer	\$6,710,467	\$600
Daniels	\$575,183	\$349
Fallon	\$862,774	\$320

Fergus	\$5,751,829	\$514
Flathead	\$69,309,542	\$798
Gallatin	\$48,698,820	\$557
Garfield	\$575,183	\$473
Golden Valley	\$1,246,230	\$1,108
Granite	\$2,300,732	\$807
Judith Basin	\$1,342,093	\$655
Lewis & Clark	\$34,894,430	\$582
Liberty	\$383,455	\$214
McCone	\$862,774	\$500
Meagher	\$1,150,366	\$605
Missoula	\$72,952,367	\$691
Musselshell	\$2,684,187	\$597
Park	\$11,311,931	\$703
Petroleum	\$287,591	\$657
Pondera	\$3,451,098	\$581
Powder River	\$1,246,230	\$734
Prairie	\$1,246,230	\$1,194
Ravalli	\$17,926,534	\$444
Rosebud	\$3,546,961	\$386
Stillwater	\$5,655,965	\$653
Sweet Grass	\$3,355,234	\$881
Teton	\$2,971,778	\$493
Toole	\$3,355,234	\$652
Treasure	\$766,911	\$1,178
Valley	\$4,409,736	\$639
Wheatland	\$2,013,140	\$1,015
Yellowstone	\$101,040,466	\$722
<i>Sub-Total</i>	\$489,672,391	\$655
TOTAL ALL COUNTIES	\$642,000,000	\$671

These estimates for all Montana counties are based on their share of Montana alcohol-related crashes with fatalities and with injuries over a three period, 2005-2007. Each county's share of total, statewide alcohol crashes was applied to the annual cost of alcohol abuse of \$642 million. The counties impacted by the SPF SIG or MTCCP funding are listed at the beginning of the table, with all other non-funded counties following.

The funded counties have an estimated economic cost incidence of \$152,327,609 or 24% of the state total while their population represents 22% of the state total. These high costs for many of Montana's small rural counties represent a significant burden on a range of stakeholders and individuals. County level costs in the millions are especially serious in counties with very few resources and a small tax base.

Economic costs of alcohol abuse affect all households directly from the trauma of a family member or loved one being killed or injured as a result of drinking and driving.

The costs also affect business and households in terms of lost work and productivity, taxes to pay for services associated with alcohol abuse, and government agencies and non-profits affected by the consequences of drinking and driving and alcohol related crashes.

The dollar scale of cost impacts by county can be brought into perspective by computing them on a per capita or per person basis. Most of the MTCCP Counties have a per person cost burden from alcohol abuse of almost \$1,000. The actual per person cost burden for all MTCCP counties is \$723 which compares to a \$655 burden per person for the other Montana counties.

CONCLUSION

Previous estimates of the economic cost of alcohol abuse did not include costs from alcohol related crashes with injuries. By adding the economic cost of these injury crashes, the total impact of alcohol abuse in Montana increases by \$131 million bringing the annual cost of alcohol abuse in Montana to \$642 million dollars.

Five people are injured or killed each day in Montana due to alcohol related vehicle crashes; the negative consequences of drinking and driving. When separated out from other alcohol abuse costs, these crashes translate into a \$621,000 per day cost to the state from health care costs, productivity loss, legal and insurance costs and property damage.

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