

## Report Highlights

- The statewide 2009-2018 age-adjusted injury mortality rate was 84.2 per 100,000 population
- Injury mortality among American Indians and Alaska Natives was twice as high as among whites
- Nearly two-thirds of injury deaths were unintentional. Most unintentional deaths were due to transportation, falls, and poisoning
- 28% of injury deaths were self-harm (suicide). The most common self-harm mechanisms were firearms, suffocation, and poisoning

## Montana EMS and Trauma Systems Section

### Injury Prevention Program

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## Injury Deaths in Montana by County 2009 to 2018

### Introduction

In Montana, injury is the leading cause of death for younger people aged 1-44 years. The disproportionate impact of injury on younger age groups and the potential to cause permanent disability makes it a high priority for prevention efforts.

This report describes injury mortality patterns in Montana at the county level. Comparing mortality rates as well as common injury etiologies across the state allows communities to identify potential preventable deaths in their area and take steps to reduce the burden of injury for their population.

### Methods

“Injury” is defined as bodily damage produced by energy exchanges or deprivations resulting in relatively sudden, discernible effects. Injuries can result from blunt or penetrating trauma, poisoning, fire and chemical burns, electrocution, drowning, asphyxiation, bites and stings, and more. Injuries are typically classified by mechanism (cause of injury) and intent (unintentional, intentional self-harm, assault, legal intervention/war).

Ten years of Montana Office of Vital Statistics death certificate data (2009 to 2018) were compiled to calculate age-adjusted injury mortality rates per 100,000 population (all ages) at the county level. Very rural counties were grouped with neighboring counties to produce stable mortality rates (based on at least 20 events). County groupings were kept as small as possible.

Montanans with an underlying cause of death coded as ICD-10 codes V01-Y36, Y85-Y87, Y89, and U01-U03 were considered deaths due to injury. The underlying cause of death ICD 10 code was used to classify injury deaths by mechanism and intent. All mortality rates were age-adjusted to the 2000 US standard population. Only deaths of Montana residents were included in this analysis.

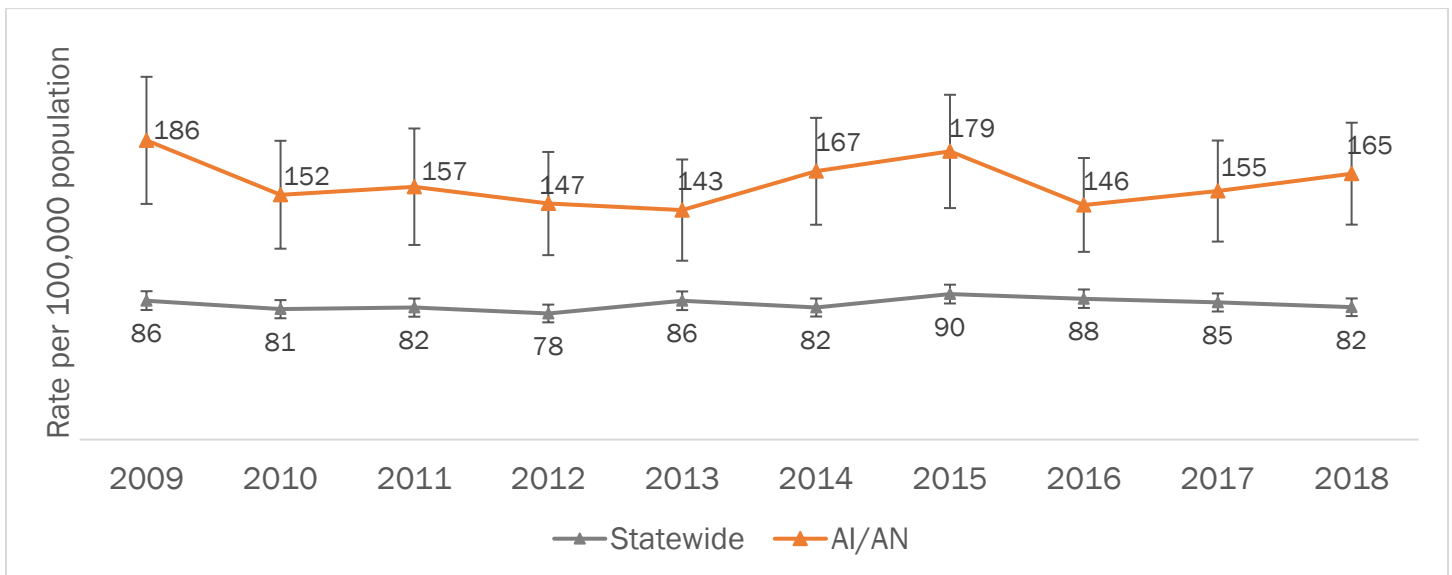
## Results

### Overall Injury Mortality Rate

A total of 9,043 deaths due to injury occurred among Montana residents from 2009-2018, or approximately 900 deaths per year. The age-adjusted injury mortality rate for this time period was 84 deaths per 100,000 population.

Injury mortality is consistently higher among Montana’s American Indian and Alaska Native (AI/AN) population than the state average (Figure 1). Making up only 7% of the state’s population, AI/AN experienced 11% of the state’s injury fatalities (N=1,029). The age-adjusted injury mortality rate among the AI/AN population was 159 deaths per 100,000, which is twice as high as among the white population (79 per 100,000).

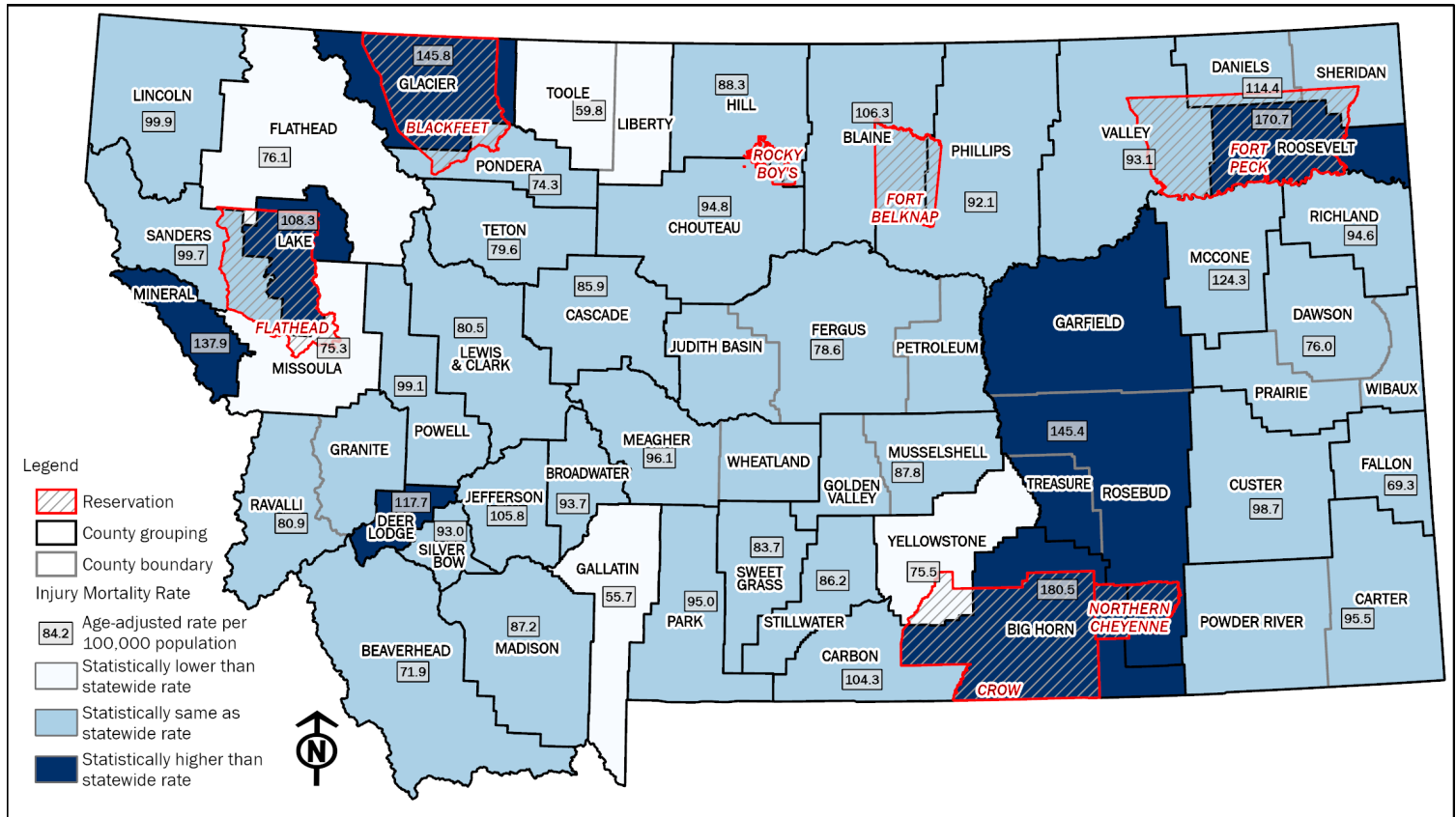
Figure 1 Age-adjusted injury mortality rate by year, Statewide compared to AI/AN (2009-2018)



County-level injury mortality rates ranged from 56 to 181 deaths per 100,000. The lowest injury mortality rate was seen in Gallatin county. A total of five counties or county groupings had injury mortality rates that were statistically lower than the statewide rate, while 7 had rates that were statistically higher than the state rate (Figure 2). Roosevelt county (171 per 100,000) and Big Horn county (181 per 100,000) had rates that were more than twice the state rate.

See Table 1 for age-adjusted injury mortality rates by county.

Figure 2 Map of age-adjusted injury mortality rate per 100,000 population by county, Montana 2009-2018



### Causes of Injury Deaths

Approximately two-thirds (65%) of all injury deaths in the past decade were unintentional, meaning that the injury was not caused on purpose, or with no intent to harm (Figure 3). The 2009-2018 age-adjusted death rate due to unintentional injury was 53 per 100,000 population. The AI/AN population had an unintentional injury mortality rate of 110 per 100,000, over twice as high as the statewide rate. The most common causes of unintentional injury death statewide were transportation<sup>1</sup>, falls, and poisoning.

Intentional self-harm, or suicide, accounted for 28% of all injury fatalities from 2009-2018 (Figure 3). The statewide age-adjusted death rate due to self-inflicted injury was 24 per 100,000 population. Among the AI/AN population, the self-harm injury death rate was 30 per 100,000. The most common causes of self-harm injury death statewide were firearms, suffocation, and poisoning.

Five mechanisms accounted for over 85% of the state’s injury deaths in the past decade. Transportation was the most common fatal injury mechanism (24%), followed by firearms (20%), poisoning (17%), falls (17%), and suffocation (9%) (Table 2).

<sup>1</sup> “Transportation” includes deaths related to motor vehicles, bicycles, pedestrian conveyances, water and air transport

Cross-tabulation of injury mechanism and intent (Table 2) showed that unintentional transportation accounted for the greatest percentage of injury deaths statewide (23%), followed by self-inflicted firearm injuries (17%), and unintentional falls (16%). Figure 4 illustrates the top causes of injury death statewide and among American Indians and Alaska Natives. See Table 3 for the top causes of fatal injury by county.

Figure 3 Injury deaths by intent category, Statewide compared to AI/AN (2009-2018)

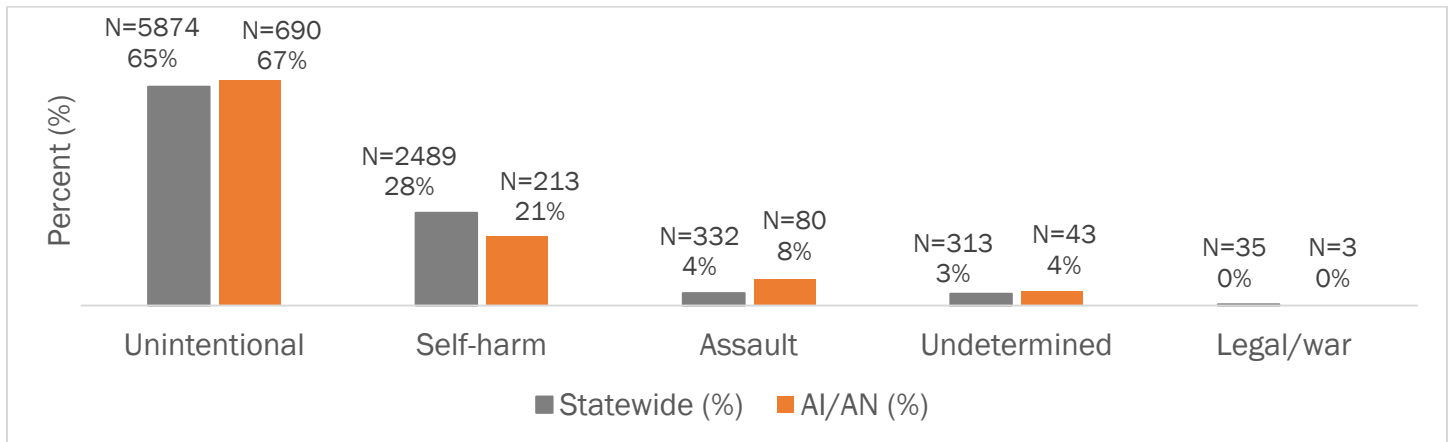
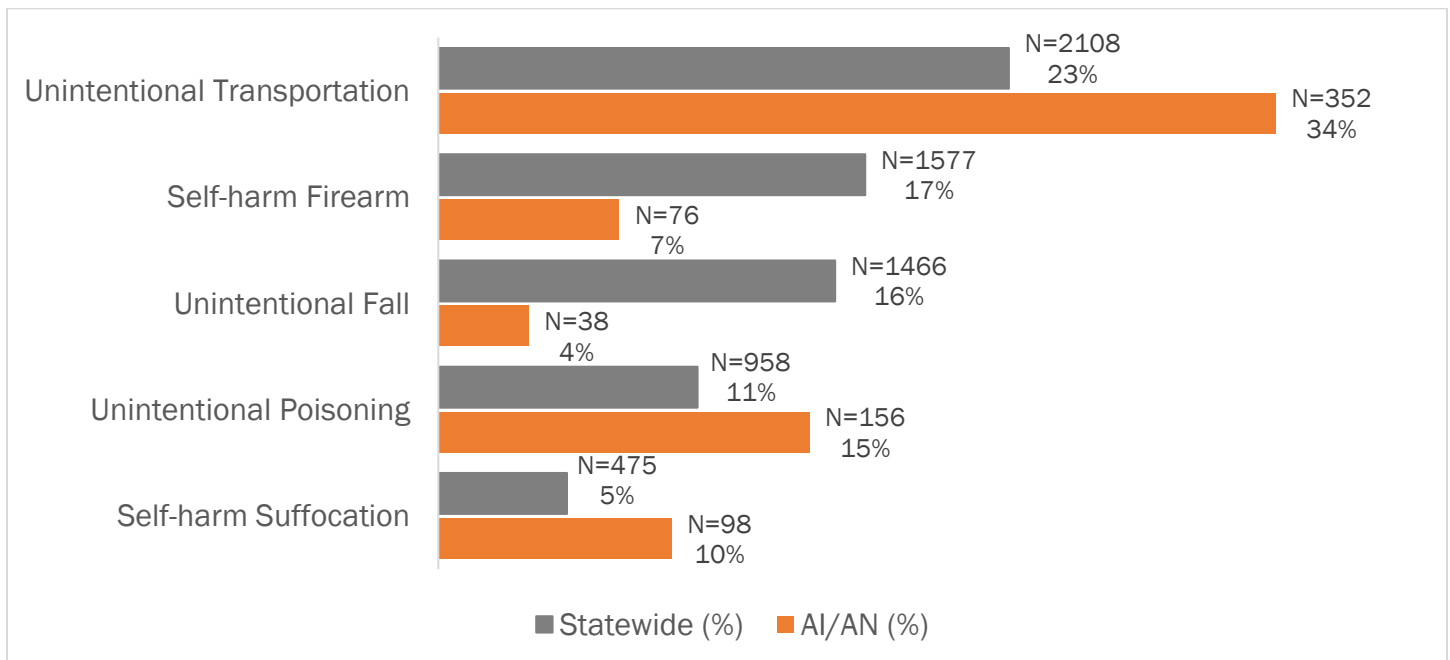


Figure 4 Top causes of fatal injury, Statewide compared to AI/AN (2009-2018)<sup>2</sup>



<sup>2</sup> ICD-10 Codes for Unintentional Transportation= V01-V99, Self-harm Firearm= X72-X74, Unintentional Fall= W00-W19, Unintentional Poisoning= X40-X49, Self-harm suffocation= X70



## Steps for Prevention

### Motor vehicle crashes

- Buckle up! Learn about [proper use of seatbelts](#) from NHTSA
- Find the right car seat for your child, install it correctly, and register it with the manufacturer. Find out more from MDT's child passenger safety [brochure](#) or NHTSA's [website](#)
- To locate a free car seat inspection station near you, call 1-877-330-BUCKL(2825)
- Designate a sober driver ahead of time. If you get stuck without a sober ride, call a friend, or a cab, Uber or Lyft. Avoid alcohol or drugs if you will be operating any form of transportation
- Do not text and drive. Put your phone out of reach, use an app to block incoming texts or calls, or have someone else text for you. If you are going to use your phone for navigational purposes, make sure that it is mounted to the dashboard
- Know before you go! Check the [interactive road report map](#) online or dial 511 to get the latest weather-related road conditions, road incidents, construction, and other travel information

### Falls

- Stepping On is an evidence-based 7-week falls prevention program geared toward individuals 60+ yrs old living independently in a home or apartment. Find a class in your community [here](#)
- The CDC's [MyMobility Plan](#) provides a home safety checklist to help prevent falls

### Poisoning and overdose

- Familiarize yourself with [current guidelines](#) on safe storage and disposal of prescription medications. Prescription drug [dropbox locations](#) allow the public to dispose of unused medications
- Learn how to recognize and reverse an opioid overdose with this [guide for patients and caregivers](#)
- The Montana Poison Control Center hotline can be reached 24/7 at 1-800-222-1222. The hotline can be used by anyone, including medical personnel, in the case of ANY suspected poisoning. For emergencies, call 9-1-1

### Firearm Safety

- [Hunter safety courses](#) are offered through Montana Fish Wildlife and Parks
- Safe Kids Worldwide has [gun safety tips](#) to keep children safe
- Some law enforcement agencies provide gun locks for free. Contact your local law enforcement agency for more details.

### Stop the Bleed

- Stop the Bleed is a national awareness campaign aiming to empower bystanders to assist injured people following a traumatic event. Find out more about Stop the Bleed [classes in your area](#) and how to get a [Bleeding Control Kit](#).



## Suicide prevention

- The Montana suicide prevention lifeline can be reached 24/7 at 1-800-273-TALK (1-800-273-8255), or by texting “MT” to 741741
- Additional suicide prevention information and resources are available on DPHHS’s [website](#)
- Access [Montana2-1-1](#) to get connected with mental health services, crisis hotlines, and other resources available in your community

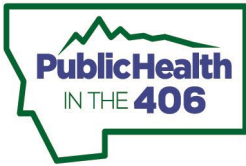


Table 1 Age-Adjusted Injury Mortality Rates by County or County Grouping (2009-2018)

County/County Grouping	All Injury (per 100,000)	95% CI	Unintentional Injury (per 100,000)	95% CI
Beaverhead	71.9	(55.8-88.0)	46.3	(33.8-58.9)
Big Horn	180.5	(155.3-205.7)	127.4	(106.3-148.5)
Blaine	106.3	(80.3-132.4)	79.8	(57.4-102.2)
Broadwater	93.7	(67.1-120.3)	70.4	(47.2-93.7)
Carbon	104.3	(83.4-125.3)	73.4	(56.2-90.6)
Carter, Powder River	95.5	(54.7-136.4)	70.9	(37.7-104.1)
Cascade	85.9	(79.5-92.2)	54.3	(49.4-59.3)
Choteau	94.8	(69.2-120.4)	60.2	(40.0-80.4)
Custer	98.7	(80.4-117.1)	65.8	(51.2-80.5)
Daniels, Sheridan	114.4	(83.9-144.9)	75.3	(51.2-99.4)
Dawson, Prairie, Wibaux	76.0	(60.1-92.0)	58.5	(44.7-72.3)
Deer Lodge	117.7	(95.3-140.1)	63.7	(48.0-79.4)
Fallon	69.3	(38.6-100.0)	63.0	(33.8-92.2)
Fergus, Judith Basin, Petroleum	78.6	(63.6-93.5)	54.4	(42.4-66.5)
Flathead	76.1	(70.5-81.8)	49.9	(45.4-54.4)
Gallatin	55.7	(50.9-60.5)	35.1	(31.2-38.9)
Garfield, Rosebud, Treasure	145.4	(121.4-169.4)	96.6	(77.1-116.1)
Glacier	145.8	(124.4-167.2)	114.2	(95.2-133.3)
Golden Valley, Musselshell	87.8	(62.1-113.5)	53.6	(35.0-72.2)
Granite, Ravalli	80.9	(72.2-89.6)	48.3	(41.6-55.0)
Hill	88.3	(73.5-103.2)	63.9	(51.4-76.4)
Jefferson	105.8	(84.9-126.8)	72.1	(54.9-89.3)
Lake	108.3	(95.7-120.9)	68.9	(58.9-79.0)
Lewis and Clark	80.5	(73.7-87.3)	52.1	(46.7-57.6)
Liberty, Toole	59.8	(42.0-77.5)	37.3	(23.8-50.7)
Lincoln	99.9	(84.6-115.2)	58.8	(47.3-70.3)
McCone	124.3	(68.5-180.2)	104.5	(54.0-155.0)
Madison	87.2	(65.4-108.9)	69.7	(50.0-89.3)
Meagher, Wheatland	96.1	(63.7-128.5)	71.0	(43.2-98.7)
Mineral	137.9	(98.7-177.2)	92.2	(59.2-125.1)
Missoula	75.3	(70.2-80.4)	48.0	(43.9-52.1)
Park	95.0	(79.6-110.4)	56.3	(44.6-67.9)
Phillips	92.1	(61.7-122.4)	56.0	(33.1-78.9)
Pondera	74.3	(53.6-94.9)	60.6	(41.8-79.5)
Powell	99.1	(76.1-122.2)	63.4	(44.8-81.9)
Richland	94.6	(75.9-113.3)	60.6	(45.8-75.5)
Roosevelt	170.7	(145-196.5)	110.1	(89.3-130.9)
Sanders	99.7	(79.2-120.2)	75.9	(58.2-93.6)

County/County Grouping	All Injury (per 100,000)	95% CI	Unintentional Injury (per 100,000)	95% CI
Silver Bow	93.0	(82.7-103.4)	52.1	(44.5-59.7)
Stillwater	86.2	(66.2-106.2)	49.2	(35.0-63.5)
Sweet Grass	83.7	(52.8-114.7)	57.2	(31.2-83.2)
Teton	79.6	(56.6-102.7)	60.9	(40.7-81.0)
Valley	93.1	(70.0-116.2)	67.0	(47.6-86.5)
Yellowstone	75.5	(71.1-79.8)	40.3	(37.2-43.4)
Montana Statewide	<b>84.2</b>	<b>(82.4-86.0)</b>	<b>53.4</b>	<b>(52.0-54.9)</b>

Table 2 Injury deaths by mechanism and intent, Statewide 2009-2018

Mechanism	Intent										All	
	Unintentional		Self-harm		Assault		Undetermined		Legal/War			
	N	%	N	%	N	%	N	%	N	%	N	%
Transportation (All)	2108	23.3	<5	0.0	7	0.1	<5	0.0	0	0.0	2122	23.5
Firearm	38	0.4	1577	17.4	166	1.8	14	0.2	34	0.4	1829	20.2
Poisoning	958	10.6	328	3.6	<5	0.0	209	2.3	0	0.0	1497	16.6
Fall	1466	16.2	16	0.2	<5	0.0	8	0.1	0	0.0	1492	16.5
Suffocation	297	3.3	475	5.3	17	0.2	6	0.1	0	0.0	795	8.8
Unspecified	358	4.0	11	0.1	47	0.5	22	0.2	0	0.0	438	4.8
Drowning/Submersion	158	1.8	15	0.2	<5	0.0	26	0.3	0	0.0	200	2.2
Other Specified	136	1.5	22	0.2	20	0.2	17	0.2	<5	0.0	196	2.2
Natural/Environmental	164	1.8	0	0.0	0	0.0	0	0.0	0	0.0	164	1.8
Fire/Burn	107	1.2	<5	0.0	5	0.1	7	0.1	0	0.0	123	1.4
Cut/Pierce	6	0.1	37	0.4	58	0.6	<5	0.0	0	0.0	102	1.1
Struck By/Against	48	0.5	0	0.0	7	0.1	0	0.0	0	0.0	55	0.6
Machinery	30	0.3	0	0.0	0	0.0	0	0.0	0	0.0	30	0.3
All	<b>5874</b>	<b>65.0</b>	<b>2489</b>	<b>27.5</b>	<b>332</b>	<b>3.7</b>	<b>313</b>	<b>3.5</b>	<b>35</b>	<b>0.4</b>	<b>9043</b>	<b>100.0</b>



Table 3 Top Causes of Fatal Injury by County or County Grouping (2009-2018)

County/County Grouping	Total Injury Deaths (N)	#1 Cause of Injury	%	#2 Cause of Injury	%	#3 Cause of Injury	%
Beaverhead	85	Unintentional- Fall	28%	Self-Harm- Firearm	24%	Unintentional- Transportation (All)	20%
Big Horn	209	Unintentional- Transportation (All)	50%	Self-Harm- Firearm	9%	Assault- Firearm	5%
Blaine	67	Unintentional- Transportation (All)	37%	Unintentional- Fall	13%	Unintentional- Poisoning	5%
Broadwater	55	Unintentional- Transportation (All)	44%	Self-Harm- Firearm	18%	Self-Harm- Firearm	12%
Carbon	116	Unintentional- Transportation (All)	31%	Self-Harm- Firearm	15%	Unintentional- Fall	13%
Carter, Powder River	28	Unintentional- Transportation (All)	32%	Self-Harm- Firearm	18%	Unintentional- Fire/Burn	11%
						Unintentional- Fall	11%
						Unintentional- Unspecified	11%
Cascade	753	Unintentional- Fall	22%	Unintentional- Transportation (All)	17%	Self-Harm- Firearm	14%
Choteau	58	Unintentional- Fall	21%	Unintentional- Transportation (All)	19%	Self-Harm- Firearm	17%
Custer	126	Unintentional- Transportation (All)	21%	Unintentional- Fall	17%	Self-Harm- Firearm	16%
Daniels, Sheridan	69	Unintentional- Transportation (All)	20%	Unintentional- Fall	17%	Self-Harm- Firearm	14%
Dawson, Prairie, Wibaux	100	Unintentional- Transportation (All)	29%	Unintentional- Fall	19%	Self-Harm- Firearm	15%
Deer Lodge	125	Self-Harm- Firearm	23%	Unintentional- Transportation (All)	14%	Unintentional- Fall	12%
				Unintentional- Poisoning	14%		
Fallon	22	Unintentional- Fall	32%	Unintentional- Transportation (All)	18%	Unintentional- Natural/Environmental	14%
						Unintentional- Other Specified	14%
Fergus, Judith Basin, Petroleum	131	Unintentional- Fall	26%	Unintentional- Transportation (All)	24%	Self-Harm- Firearm	15%
Flathead	751	Unintentional- Transportation (All)	21%	Self-Harm- Firearm	19%	Unintentional- Fall	15%
Gallatin	542	Unintentional- Transportation (All)	24%	Self-Harm- Firearm	23%	Unintentional- Fall	12%
Garfield, Rosebud, Treasure	149	Unintentional- Transportation (All)	41%	Self-Harm- Firearm	16%	Self-Harm- Suffocation	9%
Glacier	185	Unintentional- Transportation (All)	34%	Unintentional- Poisoning	19%	Unintentional- Fall	9%
Golden Valley, Musselshell	55	Unintentional- Transportation (All)	29%	Unintentional- Fall	22%	Self-Harm- Firearm	20%
Granite, Ravalli	399	Self-Harm- Firearm	25%	Unintentional- Transportation (All)	23%	Unintentional- Fall	15%
Hill	141	Unintentional- Transportation (All)	26%	Unintentional- Fall	16%	Unintentional- Poisoning	13%
Jefferson	110	Unintentional- Transportation (All)	30%	Unintentional- Fall	19%	Self-Harm- Firearm	18%
Lake	315	Unintentional- Transportation (All)	23%	Self-Harm- Firearm	19%	Unintentional- Fall	15%
Lewis and Clark	572	Unintentional- Fall	29%	Unintentional- Transportation (All)	17%	Self-Harm- Firearm	17%
Liberty, Toole	48	Unintentional- Fall	23%	Self-Harm- Firearm	17%	Unintentional- Poisoning	10%
				Unintentional- Transportation (All)	17%		
Lincoln	203	Unintentional- Transportation (All)	28%	Self-Harm- Firearm	27%	Unintentional- Fall	14%
McCone	24	Unintentional- Transportation (All)	33%	Unintentional- Fall	25%	Self-Harm- Firearm	13%

County/County Grouping	Total Injury Deaths (N)	#1 Cause of Injury	%	#2 Cause of Injury	%	#3 Cause of Injury	%
Madison	79	Unintentional-Transportation (All)	34%	Self-Harm- Firearm	14%	Unintentional- Poisoning	11%
Meagher, Wheatland	44	Unintentional-Transportation (All)	36%	Unintentional- Fall	14%	Unintentional- Poisoning	7%
Mineral	62	Unintentional-Transportation (All)	23%	Self-Harm- Firearm	20%	Unintentional- Poisoning	13%
Missoula	877	Self-Harm- Firearm	20%	Unintentional-Transportation (All)	18%	Unintentional- Fall	13%
Park	164	Unintentional-Transportation (All)	21%	Self-Harm- Firearm	19%	Unintentional- Fall	18%
Phillips	42	Unintentional-Transportation (All)	36%	Self-Harm- Firearm	18%	Unintentional- Fall	13%
Pondera	60	Unintentional- Fall	35%	Self-Harm- Firearm	24%	Unintentional- Fall	14%
Powell	78	Unintentional-Transportation (All)	21%	Unintentional-Transportation (All)	25%	Self-Harm- Firearm	12%
Richland	103	Unintentional-Transportation (All)	30%	Unintentional- Poisoning	18%	Self-Harm- Firearm	12%
Roosevelt	177	Unintentional-Transportation (All)	23%	Self-Harm- Firearm	18%	Unintentional- Poisoning	14%
Sanders	117	Unintentional-Transportation (All)	44%	Unintentional- Poisoning	15%	Self-Harm- Suffocation	11%
Silver Bow	338	Self-Harm- Firearm	19%	Self-Harm- Firearm	17%	Unintentional- Poisoning	9%
Stillwater	83	Unintentional-Transportation (All)	30%	Unintentional-Transportation (All)	16%	Unintentional- Poisoning	16%
Sweet Grass	33	Unintentional-Transportation (All)	36%	Self-Harm- Firearm	20%	Unintentional- Fall	16%
Teton	56	Unintentional-Transportation (All)	36%	Self-Harm- Firearm	24%	Unintentional- Fall	18%
Valley	75	Unintentional-Transportation (All)	30%	Unintentional- Fall	21%	Self-Harm- Firearm	18%
Yellowstone	1217	Unintentional-Transportation (All)	19%	Self-Harm- Firearm	16%	Unintentional- Fall	12%
Yellowstone	1217	Unintentional-Transportation (All)	19%	Self-Harm- Firearm	16%	Unintentional- Fall	15%
Montana Statewide	9043	Unintentional-Transportation (All)	23%	Self-Harm- Firearm	17%	Unintentional- Fall	16%