Montana Department of Justice
Forensic Science Division & Medical Examiner's Office
Annual Medical Examiner's Report - 2017

OVERVIEW:

The Montana Medical Examiner's Office is a bureau within the Montana Department of Justice, Forensic Science Division. It was created in the 1980s to provide death investigation resources for county coroners, law enforcement agencies, and county attorneys on behalf of Montana's citizens. Montana is the fourth largest state in the United States, encompassing 147,040 square miles, and has an estimated population of 1,050,493 for 2017. This report summarizes the statistical results of the autopsy cases performed during the 2017 calendar year.

OUR VISION STATEMENT:

A partnership between Medical Examiners and Coroners to promote the health, well-being and safety of the citizens of Montana through education, service, and compassionate, professional death investigation.

PROJECTS:

The Montana Medical Examiner's office is currently focused on the following projects and goals:

- Complete the creation of a new morgue facility in Billings
- Actively promote opportunities to continuously improve death investigation and establish more uniform practices among the counties
- Develop, implement and revise standard operating procedures to follow National Association of Medical Examiner Association guidelines for death investigation
- Acquire an additional forensic pathologist for the Billings office

SUMMARY OF 2016 and 2017:

The Montana Medical Examiner's Office employs three forensic pathologists and two autopsy assistants. Two pathologists work at the State crime laboratory in Missoula to serve the needs of coroners in western Montana. One pathologist works out of St. Vincent Hospital in Billings to serve the needs of coroners in Eastern Montana. During calendar year 2017 a total of 575 postmortem examinations were performed (Missoula 321, Billings 254). Our pathologists responded to a limited number of scene investigations and recoveries. We provided court testimony in various jurisdictions. Educational presentations included: the annual Montana Coroner Advanced Coroner Trainings, Basic Coroner Trainings, University of Montana Medicolegal Death Investigation Seminar, Montana Association of County Commissioner, Montana Funeral Directors Association, local schools and universities and local law enforcement agencies. Formal and informal meetings took place with coroners, law enforcement, county attorneys, organ and tissue procurement agencies, and funeral directors. As necessary, medical examiners communicated directly with families.

Based on recommendations that appear in the Scientific Working Group on Medicolegal Death Investigation (SWGMDI), an autopsy rate equal to or greater than 10% (10% of total deaths) is considered optimal surveillance to ensure that medicolegal autopsies are performed to meet public health needs including: public safety, criminal and civil justice system, medical quality assurance and other needs. Generally, the need for a postmortem examination in Montana is determined by the county coroner per Montana Code Annotated 46-4-103, but may be ordered by the county attorney, attorney general or initiated at the request of the a state medical examiner.

TOTAL AUTOPSIES BY COUNTY:

Montana consists of 56 counties. Approximately 2/3 of the population resides in the western half of the State, which is served by the Missoula office. The eastern half contains the State's largest city, Billings, with a city population of 110,323 (2016.) At the time of this report, the population and death statistics for 2017 are not currently available from Vital Statistics; therefore, most of the information contained in the chart relates to 2016. The following chart shows the following information by county: 2017 autopsy count, 2016 autopsy count, change in autopsy count between 2016 and 2017, 2016 % of total autopsies performed by medical examiner, total death per county, Autopsy percentage relative to total deaths, county population and lastly the percentage of autopsies relative to the total county population. As illustrated by the chart 12 (21%) counties (green) meet or exceed SWGMDI recommendations for 10% autopsy rate. Twenty (35%) counties (blue) have an autopsy rate between 5% and 10%. While this autopsy percentage is below 10% it is consistent with NAME certified medical examiner offices that report 5% to 7% autopsy rate. Twenty-eight (50%) counties (red) have an autopsy rate below 5% and do not meet the SWGMDI recommendations. There are a variety of factors that significantly affect the listed autopsy percentages, in particular a county with a low population may experience a significant autopsy percentage change with just 1 autopsy. It would be valuable to look at autopsy percentage rates per county over several years. Regardless, 50% of Montana counties have an autopsy rate below the SWGMDI recommendations and below the national average for NAME certified medical examiner facilities. This suggests opportunities have been missed in some counties to identify issues that have significant public health risks or potentially criminal activity. Including all Montana Counties the autopsy percentage is 6%.

AUTOPSIES BY COUNTY

County	2017 Autopsy Count	2016 Autopsy Count	2017 vs 2016 Autopsies	2016 % of Total Autopsies	Number of Deaths 2016*	Autopsies % of Total Deaths	Population (2016)*	Autopsies % of Total County Population
Beaverhead	3	3	0	0.5%	96	3.1%	9,401	0.0%
Big Horn	21	23	-2	3.8%	142	16.2%	13,343	0.2%
Blaine	2	1	1	0.2%	74	1.4%	6,601	0.0%
Broadwater	9	3	6	0.5%	70	4.3%	5,747	0.1%
Butte/SB	18	28	-10	4.7%	406	6.9%	34,553	0.1%
Carbon	7	16	-9	2.7%	106	15.1%	10,460	0.2%

Carter	3	2	1	0.3%	16	12.5%	1,203	0.2%
Cascade	23	18	5	3.0%	875	2.1%	81,755	0.0%
Chouteau	0	3	-3	0.5%	63	4.8%	5,759	0.1%
Custer	2	3	-1	0.5%	135	2.2%	11,924	0.0%
Daniels	2	2	0	0.3%	17	11.8%	1,755	0.1%
Dawson	7	2	5	0.3%	89	2.2%	9,327	0.0%
Deer Lodge	8	11	-3	1.8%	141	7.8%	9,085	0.1%
Fallon	0	2	-2	0.3%	29	6.9%	3,120	0.1%
Fergus	10	6	4	1.0%	154	3.9%	11,413	0.1%
Flathead	29	51	-22	8.5%	869	5.9%	98,082	0.1%
Gallatin	37	27	10	4.5%	584	4.6%	104,502	0.0%
Garfield	0	1	-1	0.2%	10	10.0%	1,310	0.1%
Glacier	19	13	6	2.2%	141	9.2%	13,694	0.1%
Golden Valley	2	0	2	0.0%	14	0.0%	831	0.0%
Granite	1	5	-4	0.8%	36	13.9%	3,368	0.1%
Hill	6	5	1	0.8%	152	3.3%	16,542	0.0%
Jefferson	4	1	3	0.2%	87	1.1%	11,853	0.0%
Judith Basin	1	2	-1	0.3%	15	13.3%	1,940	0.1%
Lake	40	27	13	4.5%	284	9.5%	29,758	0.1%
Lewis&Clark	35	32	3	5.4%	579	5.5%	67,282	0.0%
Liberty	1	2	-1	0.3%	18	11.1%	2,409	0.1%
Lincoln	4	3	1	0.5%	250	1.2%	19,259	0.0%
Madison	2	2	0	0.3%	96	2.1%	7,924	0.0%
McCone	0	0	0	0.0%	24	0.0%	1,700	0.0%
Meagher	1	1	0	0.2%	20	5.0%	1,827	0.1%
Mineral	2	3	-1	0.5%	61	4.9%	4,184	0.1%
Missoula	64	76	-12	12.7%	935	8.1%	116,130	0.1%
Musselshell	4	9	-5	1.5%	59	15.3%	4,589	0.2%
Park	3	13	-10	2.2%	157	8.3%	16,114	0.1%
Petroleum	2	1	1	0.2%	5	20.0%	489	0.2%
Phillips	4	3	1	0.5%	42	7.1%	4,133	0.1%
Pondera	1	1	0	0.2%	78	1.3%	6,084	0.0%
Powder River	0	1	-1	0.2%	20	5.0%	1,746	0.1%
Powell	1	6	-5	1.0%	92	6.5%	6,858	0.1%
Prairie	1	2	-1	0.3%	24	8.3%	1,182	0.2%
Ravalli	25	20	5	3.3%	474	4.2%	42,088	0.0%
Richland	7	3	4	0.5%	91	3.3%	11,482	0.0%
Roosevelt	12	12	0	2.0%	132	9.1%	11,305	0.1%
Rosebud	6	9	-3	1.5%	79	11.4%	9,287	0.1%
Sanders	4	2	2	0.3%	144	1.4%	11,534	0.0%
Sheridan	4	1	3	0.2%	48	2.1%	3,648	0.0%
Stillwater	4	6	-2	1.0%	87	6.9%	9,406	0.1%
Sweet Grass	4	4	0	0.7%	47	8.5%	3,623	0.1%
Teton	1	3	-2	0.5%	74	4.1%	6,056	0.0%
Toole	0	5	-5	0.8%	48	10.4%	4,977	0.1%
Treasure	1	0	1	0.0%	9	0.0%	692	0.0%
Valley	4	0	4	0.0%	80	0.0%	7,539	0.0%
Wheatland	2	0	2	0.0%	16	0.0%	2,117	0.0%
Wibaux	0	1	-1	0.2%	18	5.6%	1,093	0.1%
Yellowstone	122	122	0	20.4%	1509	8.1%	158,437	0.1%
Grand Total	**575**	**598**	**-23**	**100%**	**9921**	6.0%	**1,042,520**	**0.06%**

***Source: Montana Vital Records, most recent confirmed numbers**

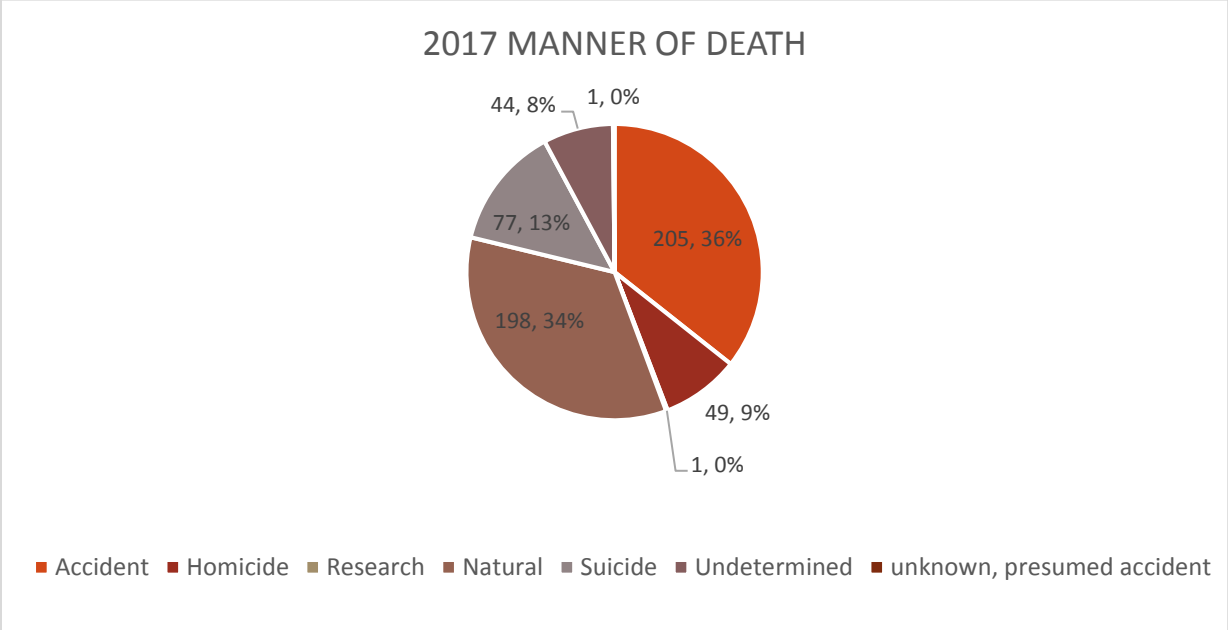
2017 AUTOPSIES BY TYPE		
AUTOPSY TYPE	**COUNT**	**% OF TOTAL**
Dis-internment	1	0%
External	22	4%
Full	530	92%
Partial	15	3%
Skeleton	7	1%
Grand Total	**575**	**100%**

Skeletal remains are analyzed by anthropologists at the University of Montana, University of North Texas or University of California-Chico anthropologists as indicated by case needs.

MANNER OF DEATH:

Manner is used to distinguish whether a death is considered natural or unnatural. If deemed unnatural, the death is categorized as either accident, suicide, homicide, or in the absence of a clear determination of manner, undetermined.

2017 AUTOPSIES MANNER OF DEATH		
MANNER	**COUNT**	**% OF TOTAL**
Accident	205	36%
Homicide	49	9%
Research	1	0%
Natural	198	34%
Suicide	77	13%
Undetermined	44	8%
Unknown, presumed accident	1	0%
Grand Total	**575**	**100%**



GENDER:

GENDER	COUNT	% OF TOTAL
Female	193	34%
Male	376	65%
Unknown	6	1%
Total	**575**	**100%**

AGE OF DECEDENTS BY MANNER:

AGE	MANNER	# OF CASES	% OF 575 CASES
Infants<=2 years	Accident	4	
	Homicide	5	
	Natural	5	
	Undetermined	16	
		30	5%
Child 3-12	Accident	3	
		3	1%
Teen 13-19	Accident	4	
	Homicide	1	
	Natural	3	
	Suicide	5	

	Undetermined	2	
		15	3%
Adult 20-65	Accident	166	
	Homicide	38	
	Natural	149	
	Suicide	65	
	Undetermined	18	
	unknown, presumed accident	1	
		437	76%
Adult Senior 66+	Accident	28	
	Homicide	5	
	Research	1	
	Natural	41	
	Suicide	7	
	Undetermined	1	
		83	14%

DEATHS ATTRIBUTABLE TO ALCOHOL OR DRUG INTOXICATION:

Medical Examiners performed 575 autopsies in death investigation cases. The toxicology section would have performed testing on most those cases. It was determined that 148 of those cases had toxicology results of significance. Below is a breakdown of the identified substances and corresponding drug results. The data below does not include deaths where the coroner did not have an autopsy performed.

Toxicology Related Case Breakdown by Manner of Death (Autopsied cases only)	
Manner of Death	**Number of cases**
Suicide	13
Natural	25
Accident	79
Undetermined	31

Toxicology Related Case Breakdown by Cause of Death (Autopsied cases only)		
Cause of Death	**# of cases**	**Comments**
Acute Ethanol Intoxication	7	Mean Ethanol: 0.471 g/dL (0.311-0.698 g/dL)
Complications of chronic ethanol use	24	Ethanol found in 8 cases with average of 0.154 g/dL
Acute Methamphetamine Intoxication	17	Mean Methamphetamine: 0.71 mg/L (0.05-2.9 mg/L)
Acute, Single Drug Intoxication	20	

Amitriptyline intoxication	(1)	0.73 mg/L combined with other drugs
Butalbital intoxication	(1)	15 mg/L combined with ethanol at 0.071 g/dL
Diphenhydramine intoxication	(1)	Decomposition case
Fentanyl intoxication	(1)	16 ng/mL
Fluoxetine intoxication	(1)	6.8 mg/L combined with other drugs
Heroin intoxication	(4)	6-AM found in blood and urine
Hydrocodone intoxication	(1)	0.13 mg/L
Methadone intoxication	(3)	Mean methadone of 0.54 mg/L combined with other drugs
Metoprolol intoxication	(1)	44 mg/L plus ethanol at 0.04 g/dL
Mirtazapine intoxication	(1)	0.69 mg/L combined with hypothermia
Mitragynine intoxication	(1)	2.5 mg/L combined with other drugs
Morphine intoxication	(1)	0.1 mg/L
Oxycodone intoxication	(2)	Mean oxycodone of 0.51 mg/L combined with other drugs
Promethazine intoxication	(1)	0.19 mg/L combined with other drugs
Acute, Multi-Drug Combinations	37	Ethanol found in 11 cases (0.19 g/dL average) Methamphetamine found in 4 cases Heroin use found in 7 cases Fentanyl found in 2 cases Oxycodone found in 11 cases (0.38 mg/L average) Hydrocodone found in 5 cases (0.1 mg/L average) Methadone found in 4 cases (0.4 mg/L average)
Carbon Monoxide Poisoning	12	Mean carboxyhemoglobin at 57% 2 cases positive for methamphetamine (Mean: 1.6 mg/L) 4 cases positive for THC (Mean: 9.7 ng/mL)
Inhalant Intoxication	3	2 cases with 1,1-Difluoroethane 1 cases with Tetrafluoroethane
Undetermined	28	-

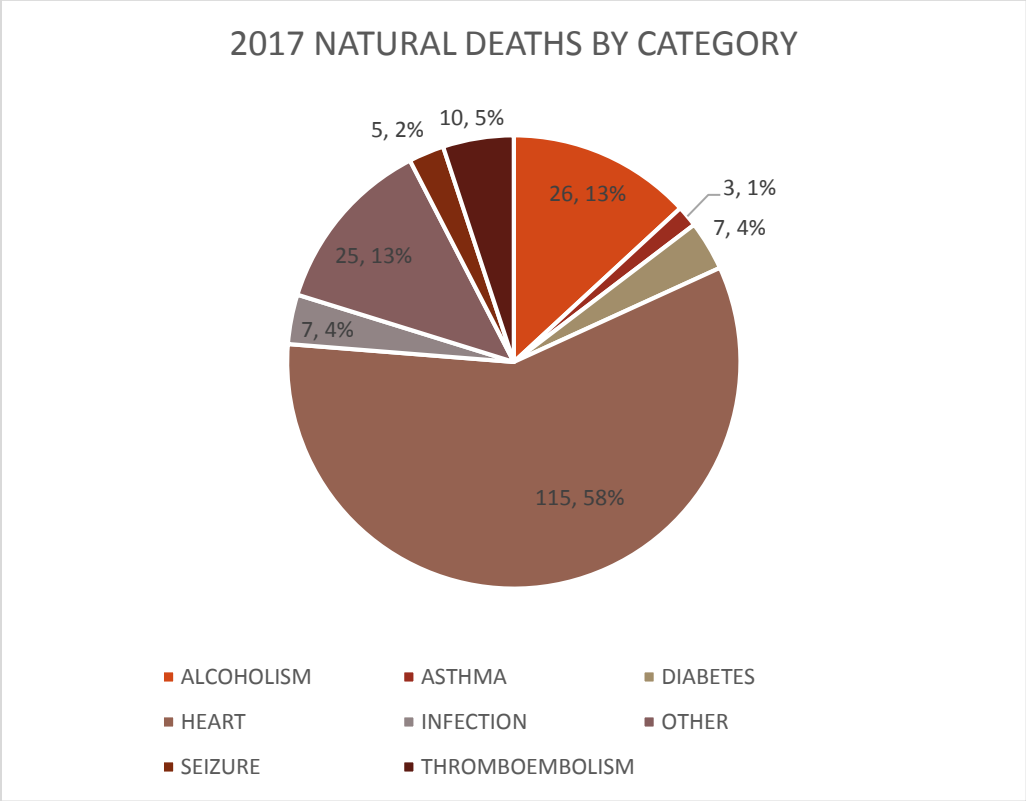
SUICIDES AND HOMICIDES ATTRIBUTABLE TO FIREARMS:

MANNER	# OF CASES
Homicide	25
Suicide	50
Grand Total	**75**
% OF TOTAL CASES	13%

NATURAL DEATHS BY CATEGORY:

CATEGORY	# OF CASES
ALCOHOLISM	26
ASTHMA	3
DIABETES	7
HEART	115
INFECTION	7
OTHER	25

SEIZURE	5
THROMBOEMBOLISM	10
Grand Total	**198**
% OF TOTAL CASES	34%



2017 TURN-AROUND TIMES:

Turn-Around Time represents the number of days between the post-mortem examination and the completion of the autopsy report. Nearly 92% of our reports in 2017 were completed within 90 days including visiting pathologists (over 93% not including visiting pathologists). NAME standards require 90% of autopsy reports are complete within 90 days.

LESS THAN 60	381	66%
60-90	146	25%
91-120	33	6%
OVER 120	15	3%
TOTAL	**575**	**100%**