



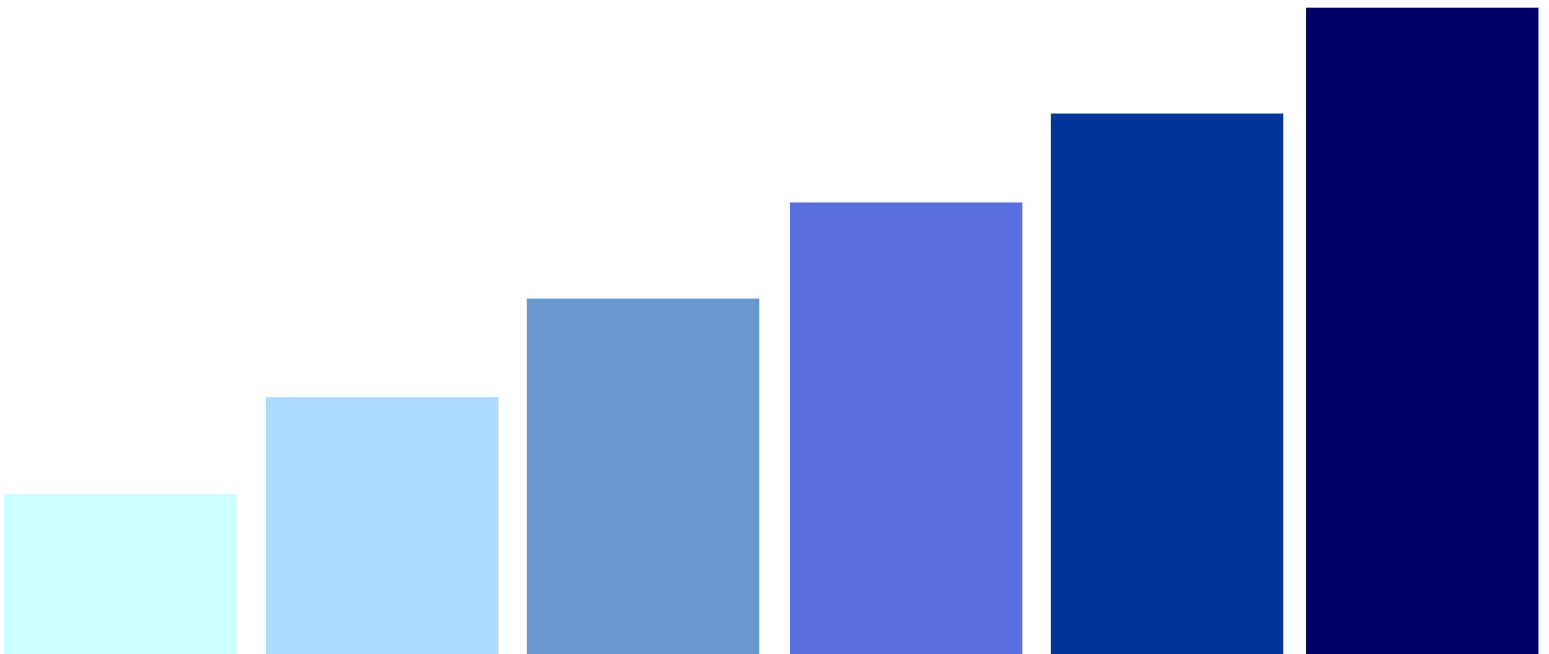
MEDICAL EXAMINER AND  
FORENSIC SERVICES

# 2020 Annual Report

## Office of the Medical Examiner

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**Allegan, Barry, Berrien, Calhoun, Grand Traverse, Kalamazoo, Leelanau,  
Mason, Muskegon, Osceola, St. Joseph and Van Buren Counties**



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Our office operates 24 hours per day, 7 days per week, 365 days per year.  
Our administrative office is open from 8:00 a.m. to 5:00 p.m. Monday through Friday, with holiday exceptions.

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# CONTENTS

Department of Pathology Faculty	6
Which Deaths Do We Investigate?	7
Identification of Decedent	7
Indications for Complete Autopsy	8
What is the difference between Cause of Death & Manner of Death?	8
The Death Investigation Process	9
Cremation Permit Authorizations	10
Public Health & Safety	10
Unclaimed Investigations	10
Terms	11
Important note regarding the data in this report:	11
COVID-19	11
<b>ALLEGAN COUNTY</b>	<b>12</b>
Summary of All Allegan County Cases	12
Cremation Permit Authorizations, Allegan County	12
Manners of Death Reported, Allegan County	13
Deaths Reported by Age (in years), Allegan County	14
Pediatric Deaths, Allegan County	14
Accidental Deaths by Mechanism, Allegan County	15
Drug-Related Deaths by Manner, Allegan County	15
Suicides by Sex & Age, Allegan County	16
Suicides by Mechanism, Allegan County	17
<b>BARRY COUNTY</b>	<b>18</b>
Summary of All Barry County Cases	18
Cremation Permit Authorizations, Barry County	18
Manners of Death Reported, Barry County	19
Deaths Reported by Age (in years), Barry County	19
Pediatric Deaths, Barry County	20
Accidental Deaths by Mechanism, Barry County	20
Drug-Related Deaths by Manner, Barry County	20
Suicides by Sex & Age, Barry County	21
Suicides by Mechanism, Barry County	21
<b>BERRIEN COUNTY</b>	<b>22</b>
Summary of All Berrien County Cases	22
Cremation Permit Authorizations, Berrien County	22
Manners of Death Reported, Berrien County	23
Deaths Reported by Age (in years), Berrien County	23

Pediatric Deaths, Berrien County	23
Accidental Deaths by Mechanism, Berrien County	24
Drug-Related Deaths by Manner, Berrien County	24
Suicides by Sex & Age, Berrien County	24
Suicides by Mechanism, Berrien County	25
<b>CALHOUN COUNTY</b>	<b>26</b>
Summary of All Calhoun County Cases	26
Cremation Permit Authorizations, Calhoun County	26
Manners of Death Reported, Calhoun County	27
Deaths Reported by Age (in years), Calhoun County	28
Pediatric Deaths, Calhoun County	28
Accidental Deaths by Mechanism, Calhoun County	29
Drug-Related Deaths by Manner, Calhoun County	29
Suicides by Sex & Age, Calhoun County	30
Suicides by Mechanism, Calhoun County	31
<b>GRAND TRAVERSE COUNTY</b>	<b>32</b>
Summary of All Grand Traverse County Cases	32
Cremation Permit Authorizations, Grand Traverse County	32
Manners of Death Reported, Grand Traverse County	33
Deaths Reported by Age (in years), Grand Traverse County	33
Pediatric Deaths, Grand Traverse County	34
Accidental Deaths by Mechanism, Grand Traverse County	34
Drug-Related Deaths by Manner, Grand Traverse County	34
Suicides by Sex & Age, Grand Traverse County	35
Suicides by Mechanism, Grand Traverse County	36
<b>KALAMAZOO COUNTY</b>	<b>37</b>
Summary of All Kalamazoo County Cases	37
Cremation Permit Authorizations, Kalamazoo County	37
Manners of Death Reported, Kalamazoo County	38
Deaths Reported by Age (in years), Kalamazoo County	39
Pediatric Deaths, Kalamazoo County	39
Accidental Deaths by Mechanism, Kalamazoo County	40
Drug-Related Deaths by Manner, Kalamazoo County	41
Suicides by Sex & Age, Kalamazoo County	42
Suicides by Mechanism, Kalamazoo County	43
<b>LEELANAU COUNTY</b>	<b>44</b>
Summary of All Leelanau County Cases	44
Cremation Permit Authorizations, Leelanau County	44
Manners of Death Reported, Leelanau County	45

Deaths Reported by Age (in years), Leelanau County	45
Accidental Deaths by Mechanism, Leelanau County	46
Drug-Related Deaths by Manner, Leelanau County	46
Suicides by Sex & Age, Leelanau County	46
Suicides by Mechanism, Leelanau County	47
<b>MASON COUNTY</b>	<b>48</b>
Summary of All Mason County Cases	48
Cremation Permit Authorizations, Mason County	48
Manners of Death Reported, Mason County	49
Deaths Reported by Age (in years), Mason County	49
Accidental Deaths by Mechanism, Mason County	49
Drug-Related Deaths by Manner, Mason County	50
Suicides by Sex & Age, Mason County	50
Suicides by Mechanism, Mason County	50
<b>MUSKEGON COUNTY</b>	<b>51</b>
Summary of All Muskegon County Cases	51
Cremation Permit Authorizations, Muskegon County	52
Manners of Death Reported, Muskegon County	52
Deaths Reported by Age (in years), Muskegon County	53
Pediatric Deaths, Muskegon County	53
Accidental Deaths by Mechanism, Muskegon County	54
Drug-Related Deaths by Manner, Muskegon County	54
Suicides by Sex & Age, Muskegon County	55
Suicides by Mechanism, Muskegon County	56
<b>OSCEOLA COUNTY</b>	<b>57</b>
Summary of Osceola County Cases	57
Cremation Permit Authorizations, Osceola County	57
Manners of Death Reported, Osceola County	58
Deaths Reported by Age (in years), Osceola County	58
Accidental Deaths by Mechanism, Osceola County	58
Drug-Related Deaths by Manner, Osceola County	59
Suicides by Sex & Age, Osceola County	59
Suicides by Mechanism, Osceola County	59
<b>ST. JOSEPH COUNTY</b>	<b>60</b>
Summary of St. Joseph County Cases	60
Cremation Permit Authorizations, St. Joseph County	60
Manners of Death Reported, St. Joseph County	61
Deaths Reported by Age (in years), St. Joseph County	61
Pediatric Deaths, St. Joseph County	62

Accidental Deaths by Mechanism, St. Joseph County _____	62
Drug-Related Deaths by Manner, St. Joseph County _____	62
Suicides by Sex & Age, St. Joseph County _____	63
Suicides by Mechanism, St. Joseph County _____	64
<b>VAN BUREN COUNTY _____</b>	<b>65</b>
Summary of Van Buren County Cases _____	65
Cremation Permit Authorizations, Van Buren County _____	65
Manners of Death Reported, Van Buren County _____	66
Deaths Reported by Age (in years), Van Buren County _____	66
Pediatric Deaths, Van Buren County _____	66
Accidental Deaths by Mechanism, Van Buren County _____	67
Drug-Related Deaths by Manner, Van Buren County _____	67
Suicides by Sex & Age, Van Buren County _____	67
Suicides by Mechanism, Van Buren County _____	68
<b>ADDITIONAL SERVICES &amp; STATS _____</b>	<b>69</b>
Division of Neuropathology _____	69
Forensic Anthropology _____	69
Hospital/Private/Consultant Postmortem Examinations _____	70
Referrals to organ procurement organization (Gift of Life Michigan), 2020 _____	70
Comparison of All Medical Examiner Counties, 2020 _____	71
Forensic Postmortem Examinations, 2020 _____	72
Manners of Death, All Medical Examiner Counties, 2020 _____	73
Significant Death Statistics, 2020 _____	74
Significant Statistics Related to COVID-19 Pandemic _____	75

***Editor's note: Every effort has been made to provide the most accurate data in this report by the Quality and Research Manager within the Department of Pathology: Abigail Grande, MPH.***

Amendment Note: This report (page 34 footnote) was amended on June 16, 2021, to remove a reference to COVID-19 in an injury-related death (fall associated with coughing episode). This death was not due to COVID-19, but instead the injuries sustained in the fall and was accurately classified as such. A second amendment was made on July 28, 2021, to update a typo on page 73. The report indicated that the total of suicides in 2019 was 16 rather than the accurate 186. This has been corrected. A third amendment was made on October 28, 2021, to correct the total number of forensic postmortem examinations on page 72. It was changed from 1,040 to 1,238 to include the 198 consultant examinations.

## Department of Pathology Faculty

Joyce L. deJong, DO

Chair and Professor

Medical Examiner

Joseph A. Prahlow, MD

Vice Chair and Professor

Deputy Medical Examiner

Theodore T. Brown, MD

Medical Director and Assistant Professor

Deputy Medical Examiner

Jered B. Cornelison, PhD

Assistant Professor

Forensic Anthropologist

Elizabeth A. Douglas, MD

Assistant Professor

Deputy Medical Examiner

Amanda O. Fisher-Hubbard, MD

Assistant Professor

Chief, Division of Neuropathology

Deputy Medical Examiner

Prentiss Jones, Jr., PhD

Associate Professor

Forensic Toxicologist

Christine M. Pink, PhD

Assistant Professor

Forensic Anthropologist

Brandy L. Shattuck, MD

Assistant Professor

Deputy Medical Examiner

## Which Deaths Do We Investigate?

The Michigan Compiled Laws (MCL) 52.202 require the county medical examiner or deputy county medical examiner to investigate the cause and manner of death of an individual under each of the following circumstances:

- The individual dies by violence.
- The individual's death is unexpected.
- The individual dies without medical attendance by a physician, or the individual dies while under home hospice care without medical attendance by a physician or a registered nurse during the 48 hours immediately preceding the time of death, unless the attending physician, if any, is able to determine accurately the cause of death.
- The individual dies as the result of an abortion, whether self-induced or otherwise.
- If a prisoner in a county or city jail dies while imprisoned, the county medical examiner or deputy county medical examiner, upon notification of the death of the prisoner, shall examine the body of the deceased prisoner.

We also consider the National Association of Medical Examiners (NAME) standards in deciding which deaths to investigate, which include:

- Deaths due to violence.
- Known or suspected non-natural deaths.
- Unexpected or unexplained deaths when in apparent good health.
- Unexpected or unexplained deaths of infants and children.
- Deaths occurring under unusual or suspicious circumstances.
- Deaths of persons in custody.
- Deaths known or suspected to be caused by diseases constituting a threat to public health.
- Deaths of persons not under the care of a physician.



## Identification of Decedent

In Michigan, MCL 52.205 requires a scientific identification in cases where visual identification of a decedent is impossible as a result of burns, decomposition, or other disfiguring injuries or the death is the result of an accident that involved two or more individuals who were approximately the same age, sex, height, weight, hair color, eye color and race. In these cases, the county medical examiner is required to verify the identity of the decedent through fingerprints, dental records, DNA or another definitive identification procedure.

## Indications for Complete Autopsy

The decision regarding whether a complete autopsy should be performed is based on the NAME Autopsy Performance Standards. Consequently, an autopsy is performed when the:

1. Death is known or suspected to have been caused by apparent criminal violence.
2. Death is unexpected and unexplained in an infant or child.
3. Death is associated with police action.
4. Death is apparently non-natural and in custody of a local, state, or federal institution.
5. Death is due to acute workplace injury.
6. Death is caused by apparent electrocution.
7. Death is by apparent intoxication by alcohol, drugs, or poison, unless a significant interval has passed, and the medical findings and absence of trauma are well documented.
8. Death is caused by unwitnessed or suspected drowning.
9. Body is unidentified and the autopsy may aid in identification.
10. Body is skeletonized.
11. Body is charred.
12. Forensic pathologist deems a forensic autopsy is necessary to determine cause or manner of death, or document injuries/disease, or collect evidence.
13. Deceased is involved in a motor vehicle incident and an autopsy is necessary to document injuries and/or determine the cause of death.

## What is the difference between Cause of Death & Manner of Death?

The cause of death is (a) the disease or injury that initiated the train of morbid events leading directly to death, or (b) the circumstances of the accident or violence that produced fatal injury.

Manner of death determination is something that originated in the United States. Unlike the cause of death, with thousands of possibilities, in Michigan, manner of death is limited to: *Natural*, *Suicide*, *Accident*, *Homicide* and *Indeterminate*. The fundamental purpose for determining the manner of death is for public health surveillance and vital statistics.

"The inference of manner is much like the inference of cause of death. One creates the equivalent of a differential diagnosis, ranks and prunes the possibilities, and comes to a conclusion as to which is most likely. The difference is in the degree to which the determination relies on external information. There is often little about a bullet-hole that tells one who created it; many wounds are equally consistent with homicide, suicide or even accident. It is necessary to consider investigational data, scene data and history."

- **Natural** deaths are due solely or nearly totally to disease and/or the aging process.
- **Accident** applies when an injury or poisoning (such as a drug overdose) causes death and there is little or no evidence that the injury or poisoning occurred with intent to harm or cause death. In essence, the fatal outcome was unintentional.
- **Suicide** results from an injury or poisoning as a result of an intentional, self-inflicted act.

- **Homicide** occurs when the death results from a volitional act committed by another person to cause fear, harm, or death. Intent to cause death is a common element but is not required for classification as a homicide. It has to be emphasized that the classification of homicide for the purpose of death certification is a "neutral" term and neither indicates nor implies criminal intent, which remains a determination within the province of legal processes.
- **Indeterminate** is a classification used when the information pointing to one manner of death is no more compelling than one or more other competing manners of death, in thorough consideration of all available information.

In general, when death involves a combination of natural processes and external factors, such as injury or poisoning, preference is given to the non-natural manner of death.

## The Death Investigation Process

A medical examiner investigator (MEI) responds to nearly all of the death scenes. The medical examiner investigator is trained to recognize the vast majority of the deaths requiring postmortem examinations and, in those cases, immediately arranges for transport to WMed for a postmortem examination. Homicides, infant deaths, and drug overdoses are examples of the deaths that are immediately sent.

If the death does not appear to meet the requirements for a postmortem examination, the MEI contacts the on-call medical examiner to discuss the case before releasing the body to a funeral home. The MEI writes a report documenting their findings and uploads images obtained at the investigation. These reports and photos are reviewed by the medical examiner or deputy medical examiner.

The medical examiner or a deputy medical examiner is assigned to each case and generally uses one of the following approaches in each of the deaths for which our office is responsible:

- **Declined Jurisdiction:** A reported death classified as an attended natural death should be documented as a Declined Jurisdiction case.
- **Direct Release:** The body is released directly from the scene to the funeral home. The MEI at the scene views the body and collects information on the scene, medical history, and social history. This information is provided to the on-call medical examiner who may decide to release a body directly to the funeral home chosen by the family.
- **Storage:** The body will be taken to WMed for temporary storage until a funeral home has been chosen. If family cannot be found or if the family does not take responsibility for the disposition of the remains, an unclaimed remains process ensues.
- **External Examination:** An external examination includes a careful evaluation of the circumstances of the death and an examination of the external surfaces of the body, with possible laboratory/toxicology testing. This includes the production of a written report.
- **Limited Examination:** A limited examination generally is within an anatomic boundary (such as a brain only examination) to recover a foreign body or to answer specific questions. This type of examination may also include

toxicology testing. This type of exam is rare and used in only special circumstances. This includes the production of a written report.

- **Complete Autopsy:** A complete examination includes external and internal examination, with toxicology. This includes the production of a written report.

## Cremation Permit Authorizations

MCL 52.210 requires funeral directors and embalmers to obtain a signed permit from the medical examiner for the county in which the death occurred. Our office reviews thousands of cremation permit requests each year. The requests for authorization to cremate involves reviewing the death certificate provided by the funeral director to ascertain that deaths that should have been reported to our office were, in fact, reported. Deaths that were not properly reported are investigated before cremation is authorized. We provide monthly detailed reports to the counties that charge for cremation permits to allow them to send invoices, as needed.

## Public Health & Safety

The major purpose of the Medical Examiner's Office is to conduct death investigations. The information obtained from individual death investigations may also be studied collectively to gather information that may be used to address public health and safety issues. Our office participates with the Child Death Review Team in all counties, providing significant information regarding how children died with the goal of preventing future deaths.

With funding from the Michigan Department of Health and Human Services (MDHHS), our team grew to include a public health data analyst specifically to assist with tackling the opioid epidemic. This has involved increased surveillance of all drug-related deaths and more detailed death certification in these types of cases across each county we serve. Our team is now working with MDHHS, the Michigan Public Health Institute (MPHI), and multiple counties to create legislation to create and support Opioid Fatality Review Teams across the state. This opioid-specific review team will identify demographical and geographical trends of drug-related deaths to guide prevention efforts.

***In addition to this report, a separate analysis of our office's improved surveillance is available and should be viewed for additional detail of all drug-related deaths reported.***

## Unclaimed Investigations

When a death occurs, there is not always someone available who is willing and able to claim the decedent and arrange for final disposition with a funeral director. The process varies with whether the decedent had resources to cover the cost of final disposition. If not, our staff members work with the State of Michigan DHHS and area funeral directors to have the decedent cremated. As this process results in an accumulation of unclaimed cremains, we started working with St. Martin of Tours Episcopal Church in Kalamazoo, Michigan in 2019 to bury the cremains. The names of each of the decedents buried in small coffins on the grounds of the church are located on plaques on the outside of the church. This annual event did not occur in 2020 due to the COVID-19 pandemic; however, we hope to resume this respectful disposition of remains as soon as it is safe to do so.

## Terms

- “MEI Scene Investigations” are those reported deaths for which an MEI went to the death scene.
- “Deaths Investigated” include MEI Scene Investigations as well as reported deaths that, while may not allow for a scene investigation, involved an investigation beyond the initial report of the death, usually in the form of a records review in response to information provided as part of a cremation request.
- The category “Referrals to Gift of Life” does not include in-hospital deaths reported to the Medical Examiner’s Office, which are referred to Gift of Life by hospital staff rather than the Medical Examiner’s Office.
- For “Accidental Deaths,” the subcategory “Vehicle” consists of deaths that were classified as transportation-related fatalities and includes all forms of transport; drivers/operators, passengers and pedestrians; and types of death that might otherwise fall into a different sub-classification, such as vehicle fires and traumatic asphyxia.

## Important note regarding the data in this report:

The data reflects the county where the individual was pronounced dead rather than the county of residence or the county in which the incident leading to death might have occurred. If a motor vehicle collision occurs in County A, and an individual injured in the collision is transported to and eventually reported dead in County B, the death is reported to the Medical Examiner of County B. Consequently, counties with major medical centers typically have a much higher number of deaths with injuries that may have occurred in another county.

## COVID-19

In March of 2020, the COVID-19 pandemic changed the way we lived and worked in a moment’s notice. Our investigative and autopsy teams adjusted safety protocols and implemented new testing procedures to adhere to CDC guidelines while continuing to serve our communities as essential healthcare workers.

The end of this report will provide data for the COVID-19-related deaths reported to our office during the pandemic. We will outline the number of decedents tested in both the field and in the autopsy suite and capture the overall increase in deaths with an emphasis on how the surge of deaths affected our office. However, our data does not capture the full burden of the pandemic on the communities and healthcare systems in the counties that we serve, as the majority of COVID-19-related deaths took place in a hospital setting, thus not requiring notification to the Medical Examiner’s Office.

Of significance, the total number of deaths in each county increased, sometimes to record levels. When the number of deaths increase, so do the number of deaths reported to our office, the number of deaths investigated, and the number of postmortem examinations needed. This increase has continued well into 2021 and our sincere hope is that the numbers begin to decline.

# ALLEGAN COUNTY

## Summary of All Allegan County Cases

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total Deaths in the County	607	549	602	657	705	753	745	788	772	819 <sup>1</sup>	973 <sup>2</sup>
Deaths Reported to the ME	164	172	162	182	193	176	203	188	197	219	291
Deaths Investigated	N/A	N/A	145	164	189	170	192	164	191	199	278
MEI Scene Investigations	147	155	143	160	177	152	174	158	185	179	250
Death Certificates by ME	98	83	78	76	97	77	85	76	88	88	120
Bodies Transported to WMed	80	68	63	58	74	66	62	69	72	69	90
Complete Autopsy	57	51	43	49	63	32	36	45	41	37	54
Limited Autopsy	4	2	6	1	2	2	5	2	2	3	6
External Examination	16	13	11	5	7	18	17	13	24	21	23
Storage Only at WMed	3	2	3	3	2	14	4	9	5	8	7
Total Cases with Toxicology	70	51	54	54	70	47	52	54	59	55	79
Unidentified Remains After Exam	0	0	0	0	2	1	0	0	1	2	0
Referrals to Gift of Life	14	35	38	32	62	64	63	73	61	55	97
Tissue Donations	4	3	4	0	5	8	5	6	4	11	9
Cornea Donations	1	3	5	0	6	7	4	7	4	5	5
Unclaimed Investigations	0	2	2	1	2	3	1	2	2	8	9
Exhumations	0	0	0	0	0	0	0	0	0	0	0

## Cremation Permit Authorizations, Allegan County

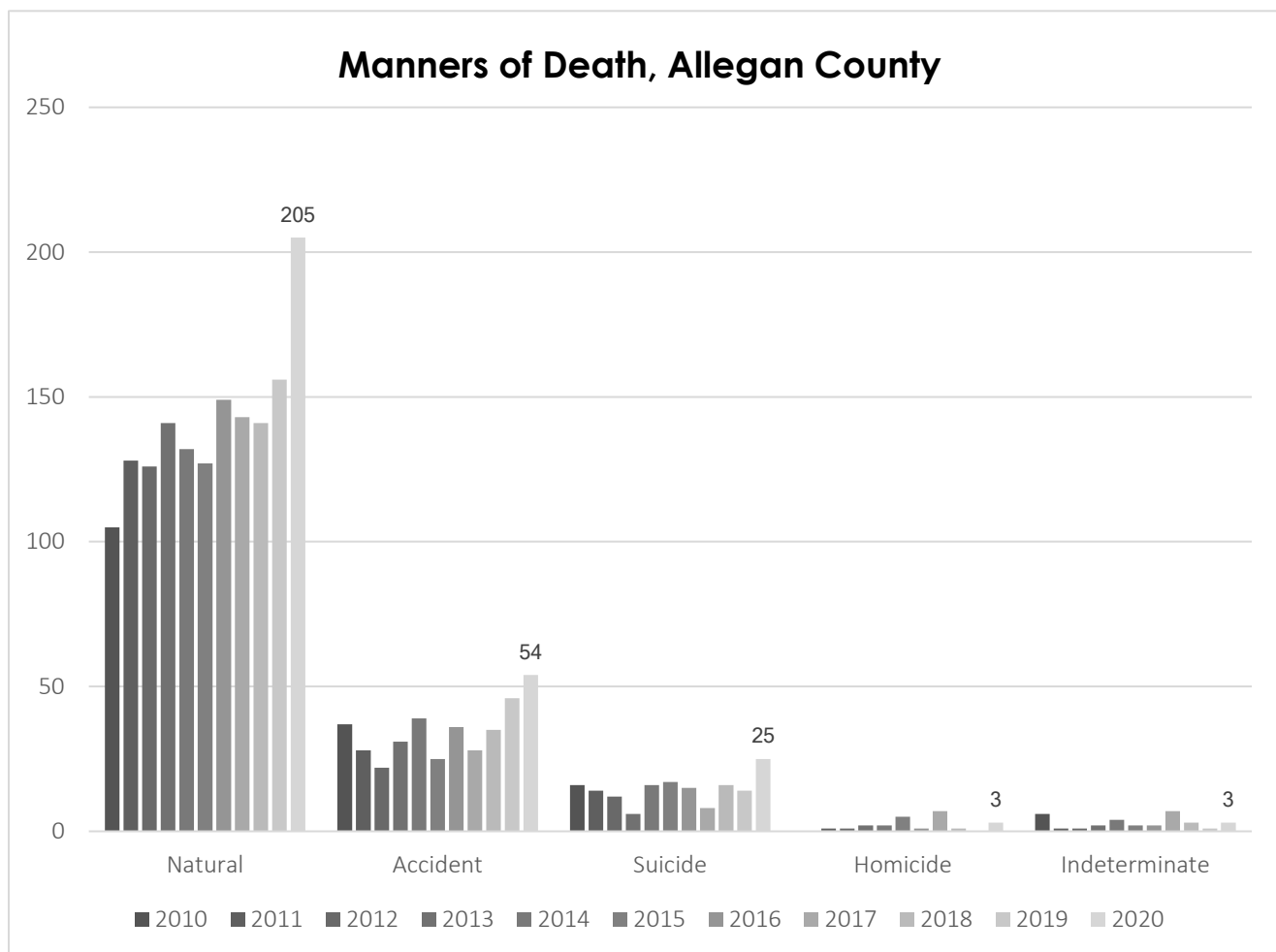
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Cremation Permits	287	300	299	350	409	404	442	469	487	519	650
% of Total Deaths with Cremation	47%	55%	50%	53%	58%	54%	60%	59%	63%	63%	67%

<sup>1</sup> Updated total number of deaths occurring in the county

<sup>2</sup> Provisional total number of deaths occurring in the county

## Manners of Death Reported, Allegan County

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Natural	105	128	126	141	132	127	149	143	141	156	205
Accident	37	28	22	31	39	25	36	28	35	46	54
Suicide	16	14	12	6	16	17	15	8	16	14	25
Homicide	0	1	1	2	2	5	1	2	1	0	3 <sup>1</sup>
Indeterminate	6	1	1	2	4	2	2	7	3	1	3 <sup>2</sup>
<b>Total</b>	<b>164</b>	<b>172</b>	<b>162</b>	<b>182</b>	<b>193</b>	<b>176</b>	<b>203</b>	<b>188</b>	<b>196</b>	<b>217</b>	<b>290<sup>3</sup></b>



<sup>1</sup> Includes (1) Homicide via unspecified means, missing since 1989

<sup>2</sup> Includes (1) Mixed drug intoxication; (1) Motor vehicle collision; (1) Excited delirium due to acute drug intoxication

<sup>3</sup> Does not include (1) Synthetic tongue

## Deaths Reported by Age (in years), Allegan County<sup>1</sup>

	< 1	1 - 5	6 - 10	11 - 17	18 - 25	26 - 44	45 - 64	65 +
2010	0	0	1	1	9	21	55	74
2011	0	0	1	3	9	14	49	95
2012	0	0	0	0	5	20	63	74
2013	2	0	0	0	7	17	57	99
2014	3	0	0	1	6	16	73	92
2015	0	1	1	5	7	15	59	87
2016	0	1	0	0	5	26	58	112
2017	3	1	0	2	3	17	54	106
2018	1	3	0	2	4	29	55	102
2019	1	0	0	0	6	22	57	131
2020 <sup>2</sup>	0	0	0	4	7	33	99	147

## Pediatric Deaths, Allegan County

The four deaths of individuals under 18 years of age include:

1. 11-17 years old
  - a. (1) Homicide by unspecified means, 1989 missing person; homicide
  - b. (1) Hanging; suicide
  - c. (1) Lymphocytic myocarditis; natural
  - d. (1) Shotgun wound of head; suicide

<sup>1</sup> All stillbirths and spontaneous abortions (miscarriages) investigated but not requiring an examination have been removed from this table for a more accurate representation of deaths reported under the age of one year.

<sup>2</sup> Does not include (1) Synthetic tongue

## Accidental Deaths by Mechanism, Allegan County

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Vehicle	15	12	13	9	11	10	9	12	12	9	18
Drug-Related	6	7	3	10	20	7	11	10	9	17	14 <sup>1</sup>
Drowning	1	2	0	1	1	0	1	3	3	1	3 <sup>2</sup>
Fall	7	4	2	7	5	5	10	3	10	12	15
Fire	3	2	3	1	0	0	0	0	0	1	0
Environmental Exposure	0	0	0	2	0	2	1	0	0	1	2 <sup>3</sup>
Asphyxia	3	2	1	0	0	0	2	0	2	3	2 <sup>4</sup>
Other	2	0	0	2	2	1	2	0	0	2	0
<b>Total</b>	<b>37</b>	<b>29</b>	<b>22</b>	<b>31</b>	<b>39</b>	<b>25</b>	<b>36</b>	<b>28</b>	<b>35<sup>5</sup></b>	<b>46</b>	<b>54</b>

## Drug-Related Deaths by Manner, Allegan County<sup>6</sup>

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Accident	6	7	3	10	20	7	11	10	9	17	14
Suicide	2	3	0	1	4	0	0	0	2	0	0
Indeterminate	2	0	1	0	0	0	1	2	0	0	2
<b>Total</b>	<b>10</b>	<b>10</b>	<b>4</b>	<b>11</b>	<b>24</b>	<b>7</b>	<b>12</b>	<b>12</b>	<b>11</b>	<b>17</b>	<b>16</b>
Total involving opioid(s)	N/A	N/A	N/A	N/A	N/A	6	8	6	8	13	11
% of Accidental and Indeterminate Deaths Involving Opioids	N/A	N/A	N/A	N/A	N/A	86%	67%	50%	78%	76%	69%

<sup>1</sup> Includes (1) Mixed drug intoxication associated with possible hypothermia

<sup>2</sup> Includes (1) Drowning associated with mixed drug intoxication

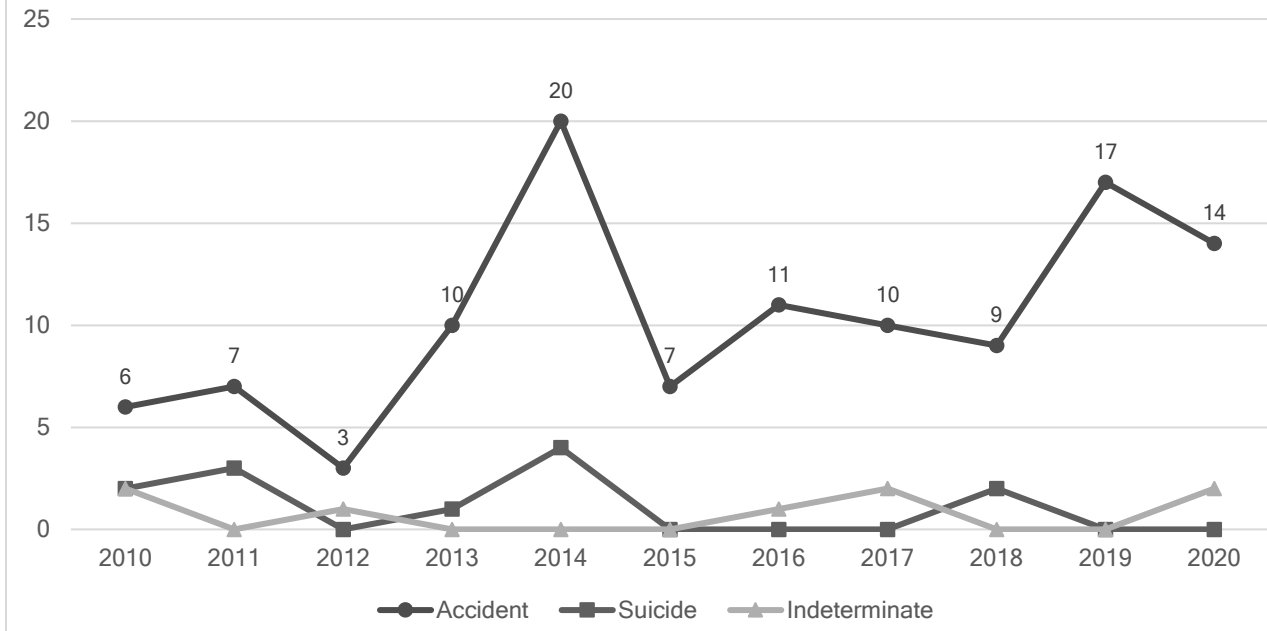
<sup>3</sup> Includes (1) Hypothermia associated with acute drug intoxication

<sup>4</sup> Includes (1) Choking associated with acute alcohol intoxication; (1) Compression asphyxia due to trench collapse

<sup>5</sup> (1) Death categorized twice (drowning & drug-related)

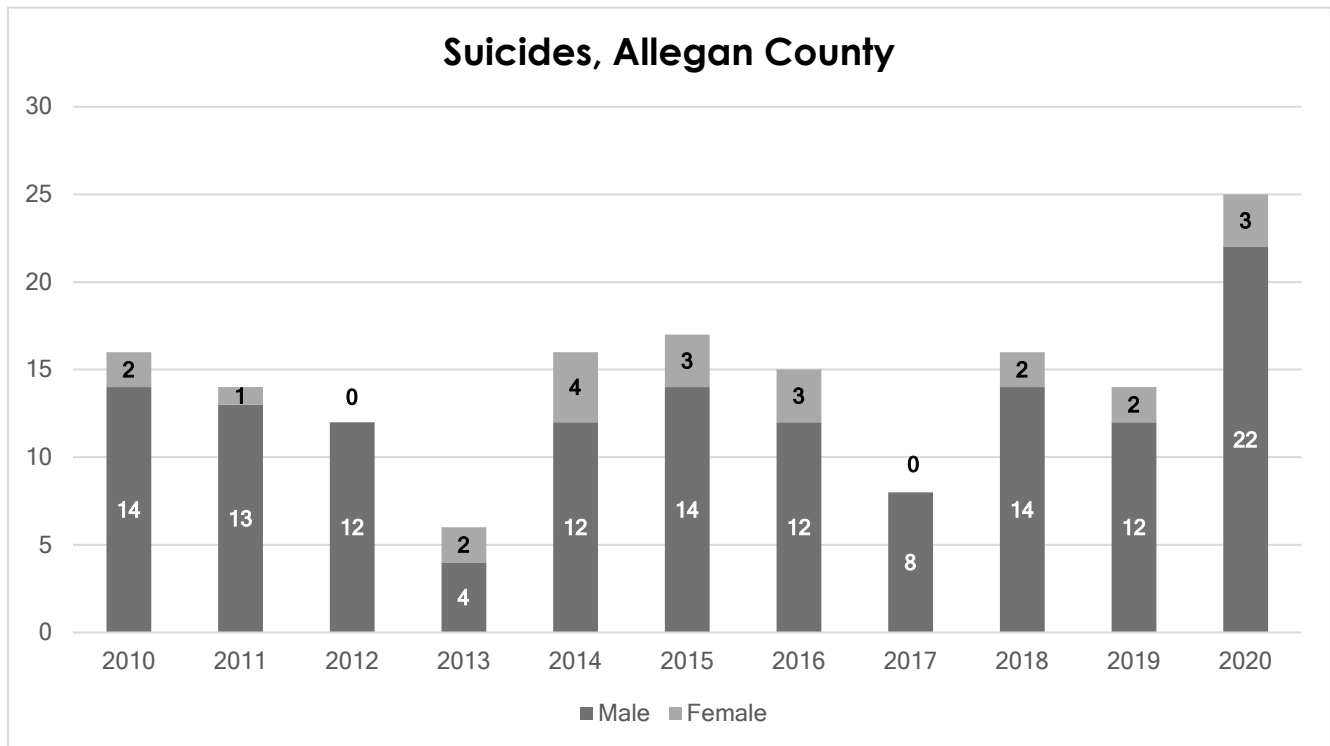
<sup>6</sup> Acute alcohol intoxications are defined as drug-related deaths and are included in this data.

## Drug-Related Deaths, Allegan County



## Suicides by Sex & Age, Allegan County

Year	Total	Male	Female	0 – 17	18 - 25	26 - 44	45 - 64	65 +
2010	16	14	2	0	3	8	2	3
2011	14	13	1	0	1	7	4	2
2012	12	12	0	0	1	3	6	2
2013	6	4	2	0	1	2	2	1
2014	16	12	4	0	1	4	8	3
2015	17	14	3	2	4	1	5	5
2016	15	12	3	0	3	6	3	3
2017	8	8	0	0	2	0	3	3
2018	16	14	2	0	0	7	7	2
2019	14	12	2	0	3	4	3	4
2020	25	22	3	2	1	5	14	3



## Suicides by Mechanism, Allegan County

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Firearm	6	6	9	3	11	11	10	7	8	6	15
Hanging	6	3	3	0	1	4	4	0	5	6	7
Carbon Monoxide	1	1	0	1	0	0	1	1	0	0	1
Drug Intoxication	2	2	0	1	4	0	0	0	1	0	0
Motor Vehicle	1	2	0	1	0	0	0	0	1	0	1
Sharp Force Trauma	0	0	0	0	0	0	0	0	0	1	0
Asphyxia/Suffocation	0	0	0	0	0	2	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	1	1	1 <sup>1</sup>
<b>Total</b>	<b>16</b>	<b>14</b>	<b>12</b>	<b>6</b>	<b>16</b>	<b>17</b>	<b>15</b>	<b>8</b>	<b>16</b>	<b>14</b>	<b>25</b>

<sup>1</sup> (1) Jump from height

# BARRY COUNTY

## Summary of All Barry County Cases<sup>1</sup>

	2015	2016 <sup>2</sup>	2018	2019	2020
Total Deaths in the County	416	399	390	399 <sup>3</sup>	453 <sup>4</sup>
Deaths Reported to the ME	125	130	146	121	161
Deaths Investigated	118	124	131	108	147
MEI Scene Investigations	112	120	128	103	132
Death Certificates by ME	53	57	52	54	52
Bodies Transported to WMed	43	47	41	38	35
Complete Autopsy	35	37	25	28	22
Limited Autopsy	1	0	1	2	2
External Examination	6	8	12	8	7
Storage Only at WMed	1	2	3	0	4
Total cases with Toxicology	N/A	N/A	35	37	28
Unidentified Remains After Exam	N/A	N/A	0	0	0
Referrals to Gift of Life	40	48	44	22	44
Tissue Donations <sup>5</sup>	6	17	3	3	2
Cornea Donations	N/A	N/A	0	1	1
Unclaimed Investigations	1	0	1	0	4
Exhumations	N/A	N/A	0	0	0

## Cremation Permit Authorizations, Barry County

	2018	2019	2020
Cremation Permits	262	251	303
% of Total Deaths with Cremation	67%	63%	67%

<sup>1</sup> Data for 2017 is not available at the time this report is authored

<sup>2</sup> Data from years 2015-2016 obtained from Sparrow Hospital

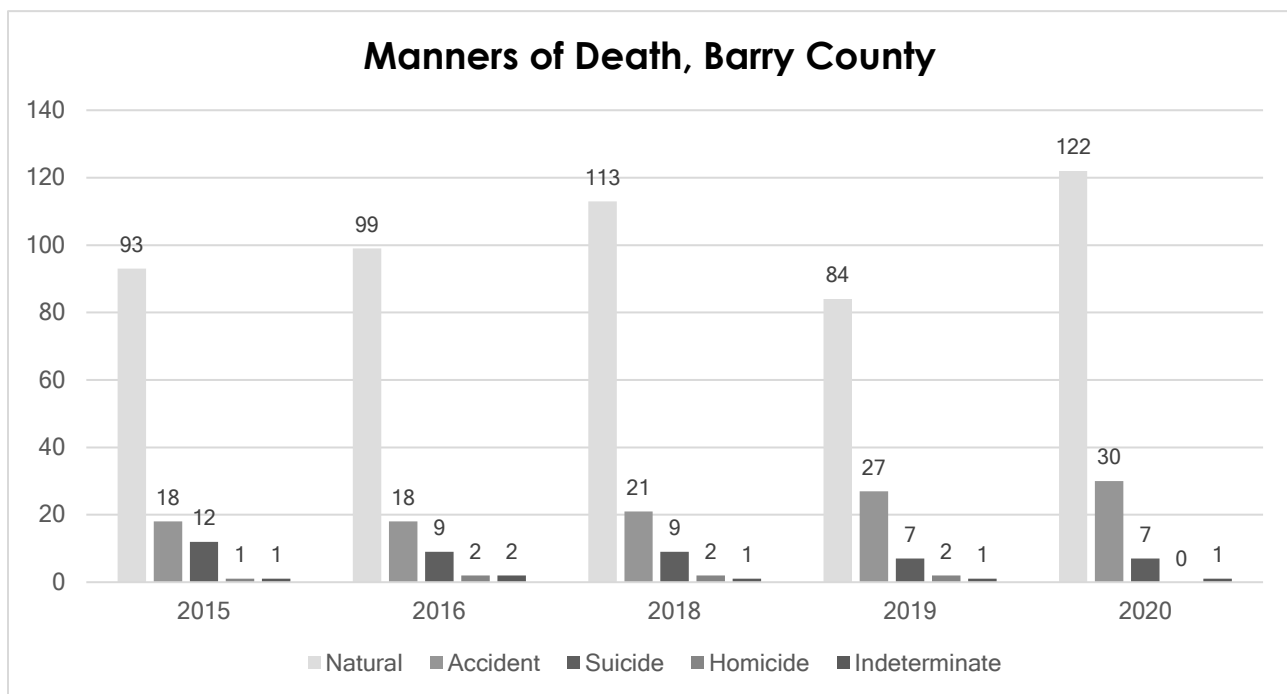
<sup>3</sup> Updated total number of deaths occurring in the county

<sup>4</sup> Provisional total number of deaths occurring in the county

<sup>5</sup> 2016 and 2017 data include both tissue and cornea donations combined

## Manners of Death Reported, Barry County<sup>1</sup>

	2015	2016	2018	2019	2020
Natural	93	99	113	84	122
Accident	18	18	21	27	30
Suicide	12	9	9	7	7
Homicide	1	2	2	2	0
Indeterminate	1	2	1	1	1 <sup>2</sup>
<b>Total</b>	<b>125</b>	<b>130</b>	<b>146</b>	<b>121</b>	<b>160<sup>3</sup></b>



## Deaths Reported by Age (in years), Barry County<sup>4</sup>

	< 1	1 - 5	6 - 10	11 - 17	18 - 25	26 - 44	45 - 64	65 +
2018	0	0	0	1	0	8	46	89
2019	1	0	0	2	5	12	30	71
2020	3	0	0	0	4	13	42	98

<sup>1</sup> Data from years 2015-2016 obtained from Sparrow Hospital

<sup>2</sup> (1) Unexplained sudden death (of infant) associated with illicit drug exposure; indeterminate

<sup>3</sup> Does not include (1) Stillbirth investigation (cremation authorization)

<sup>4</sup> All stillbirths and spontaneous abortions (miscarriages) investigated but not requiring an examination have been removed from this table for a more accurate representation of deaths reported under the age of one year.

## Pediatric Deaths, Barry County

The three deaths of individuals under 18 years of age include:

1. <1 year old
  - a. (1) Unexplained sudden death (of infant) associated with illicit drug exposure; indeterminate
  - b. (1) Extreme prematurity; natural
  - c. (1) Congenital cardiac anomaly; natural

## Accidental Deaths by Mechanism, Barry County

	2018	2019	2020
Vehicle	7	11	6
Drug-Related	4	5	10
Drowning	0	3	1
Fall	8	4	10
Fire	0	1	0
Environmental Exposure	0	1	0
Asphyxia	1	2	1 <sup>1</sup>
Other	1	0	2 <sup>2</sup>
<b>Total</b>	<b>21</b>	<b>27</b>	<b>30</b>

## Drug-Related Deaths by Manner, Barry County<sup>3</sup>

	2018	2019	2020
Accident	4	5	10
Suicide	0	0	0
Indeterminate	1	1	0
<b>Total</b>	<b>5</b>	<b>6</b>	<b>10</b>
Total involving opioid(s)	2	4	8
% of Accidental and Indeterminate Deaths Involving Opioids	40%	67%	80%

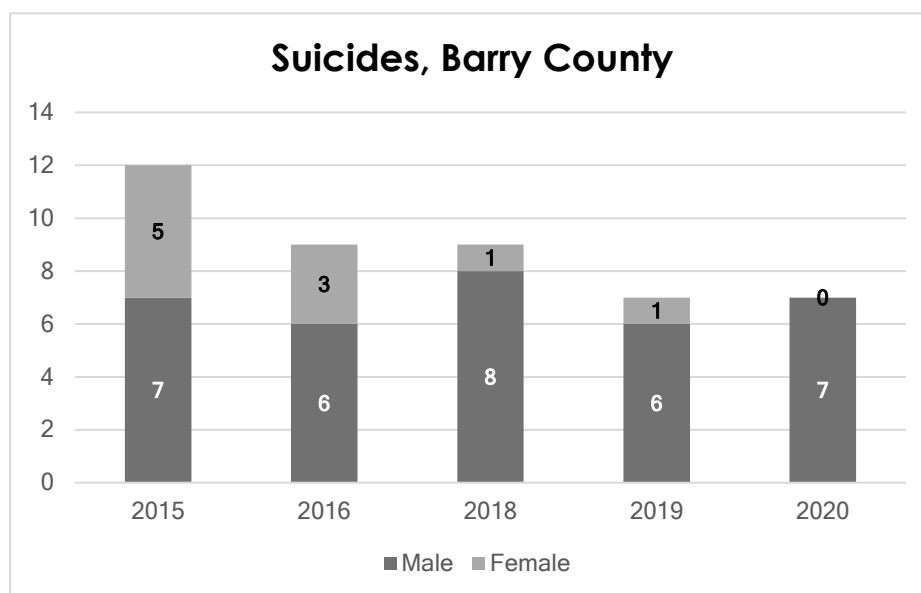
<sup>1</sup> (1) Choking

<sup>2</sup> Includes (1) Blunt force head injuries due to being struck by falling tree limb; (1) Gunshot wound of chest

<sup>3</sup> Acute alcohol intoxications are defined as drug-related deaths and are included in this data.

## Suicides by Sex & Age, Barry County

Year	Total	Male	Female	0 - 17	18 - 25	26 - 44	45 - 64	65 +
2015	12	7	5	1	0	7	4	0
2016	9	6	3	1	0	1	5	2
2018	9	8	1	1	0	1	4	3
2019	7	6	1	1	1	0	3	2
2020	7	7	0	0	1	2	3	1



## Suicides by Mechanism, Barry County

	2015	2016	2018	2019	2020
Firearm	7	7	7	4	4
Hanging	3	1	1	3	2
Carbon Monoxide	0	0	0	0	1
Drug Intoxication	2	1	0	0	0
Motor Vehicle	0	0	0	0	0
Sharp Force Trauma	0	0	0	0	0
Asphyxia/Suffocation	0	0	0	0	0
Other	0	0	1	0	0
<b>Total</b>	<b>12</b>	<b>9</b>	<b>9</b>	<b>7</b>	<b>7</b>

## Summary of All Berrien County Cases

	2019	2020
Total Deaths in the County	1,622	1,867 <sup>1</sup>
Deaths Reported to the ME	430	596
Deaths Investigated	399	540
MEI Scene Investigations	353	461
Death Certificates by ME	152	207
Bodies Transported to WMed	132	152
Complete Autopsy	90	103
Limited Autopsy	5	4
External Examination	26	25
Storage Only at WMed	11	20
Total Cases with Toxicology	110	126
Unidentified Remains After Exam	1	3 <sup>2</sup>
Referrals to Gift of Life	80	137
Tissue Donations	7	8
Cornea Donations	4	7
Unclaimed Investigations	10	19
Exhumations	1	0

## Cremation Permit Authorizations, Berrien County

	2019	2020
Cremation Permits	1,045	1,218
% of Total Deaths with Cremation	64%	65%

<sup>1</sup> Provisional total number of deaths occurring in the county

<sup>2</sup> Includes (1) Mandible only, likely historic or prehistoric; (2) Skeletal remains of cold cases taken into our custody from law enforcement archives

## Manners of Death Reported, Berrien County

	2019	2020
Natural	321	470
Accident	71	87
Suicide	21	21
Homicide	8	8
Indeterminate	9	6 <sup>1</sup>
<b>Total</b>	<b>430</b>	<b>592<sup>2</sup></b>

## Deaths Reported by Age (in years), Berrien County<sup>3</sup>

	< 1	1 - 5	6 - 10	11 - 17	18 – 25	26 - 44	45 - 64	65 +
2019	6	1	1	2	6	58	108	246
2020 <sup>4</sup>	2	2	0	5	16	55	172	340

## Pediatric Deaths, Berrien County

The nine deaths of individuals under 18 years of age include:

1. <1 year old
  - a. (1) Unexplained sudden death associated with maternal diabetes, prematurity; natural
  - b. (1) Unexplained sudden death associated with unsafe sleep; indeterminate
2. 1-5 years old
  - a. (1) Viral myocarditis associated with Mycoplasma pneumoniae co-infection; natural
  - b. (1) Respiratory Syncytial Virus (RSV); natural
3. 11-17 years old
  - a. (2) Inhalation of products of combustion and thermal injuries (house fire); indeterminate
  - b. (1) Multiple gunshot wounds; homicide
  - c. (1) Drowning (lake); accident
  - d. (1) Hanging; suicide

<sup>1</sup> Includes (2) Inhalation of products of combustion associated with thermal injuries (house fire); (1) Gunshot wound of head; (1) Complications due to remote hanging; (1) Carbon monoxide intoxication associated with mixed drug intoxication; (1) Unexplained sudden death (of infant) associated with unsafe sleep

<sup>2</sup> Does not include (1) Mandible only, likely historic or prehistoric; (2) Skeletal remains of cold cases taken into our custody from law enforcement archives; (1) Stillbirth investigation (cremation authorization)

<sup>3</sup> All stillbirths and spontaneous abortions (miscarriages) investigated but not requiring an examination have been removed from this table for a more accurate representation of deaths reported under the age of one year.

<sup>4</sup> Does not include (1) Mandible only, likely historic or prehistoric; (2) Skeletal remains of cold cases taken into our custody from law enforcement archives

## Accidental Deaths by Mechanism, Berrien County

	2019	2020
Vehicle	21	15
Drug-Related	23	37
Drowning	4	9 <sup>1</sup>
Fall	12	15 <sup>2</sup>
Fire	2	2 <sup>3</sup>
Environmental Exposure	3	4 <sup>4</sup>
Asphyxia	3	4 <sup>5</sup>
Other	3	1 <sup>6</sup>
<b>Total</b>	<b>71</b>	<b>87</b>

## Drug-Related Deaths by Manner, Berrien County<sup>7</sup>

	2019	2020
Accident	23	37
Suicide	2	1
Indeterminate	1	0
<b>Total</b>	<b>26</b>	<b>38</b>
Total involving opioid(s)	22	29
% of Accidental and Indeterminate Deaths Involving Opioids	92%	78%

## Suicides by Sex & Age, Berrien County

<i>Year</i>	Total	Male	Female	0 - 17	18 - 25	26 - 44	45 - 64	65 +
2019	21	17	4	1	0	9	4	7
2020	21	18	3	1	2	4	8	6

<sup>1</sup> Includes (1) Drowning (bathtub) associated with mixed drug intoxication

<sup>2</sup> Includes (1) Complications of head injuries with contributing COVID-19 infection

<sup>3</sup> Includes (1) Inhalation of smoke containing burning poison ivy (brush fire)

<sup>4</sup> Includes (1) Hypothermia associated with acute drug intoxication; (1) Chronic alcohol use associated with possible hypothermia

<sup>5</sup> Includes (2) Asphyxia due to choking; (1) Positional asphyxia; (1) Traumatic asphyxia (pinned beneath vehicle)

<sup>6</sup> (1) Gunshot wound of chest

<sup>7</sup> Acute alcohol intoxications are defined as drug-related deaths and are included in this data.

## Suicides by Mechanism, Berrien County

	2019	2020
Firearm	16	14
Hanging	3	5
Carbon Monoxide	0	0
Drug Intoxication	2	1
Motor Vehicle	0	0
Sharp Force Trauma	0	0
Asphyxia/Suffocation	0	0
Other	0	1 <sup>1</sup>
<b>Total</b>	<b>21</b>	<b>21</b>

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<sup>1</sup> (1) Drowning (lake)

# CALHOUN COUNTY

## Summary of All Calhoun County Cases

	2014	2015	2016	2017	2018	2019	2020
Total Deaths in the County	1,390	1,378	1,427	1,396	1,495	1,521 <sup>1</sup>	1,783 <sup>2</sup>
Deaths Reported to the ME	377	429	411	443	475	508	585
Deaths Investigated	335	392	361	400	415	442	518
MEI Scene Investigations	296	311	307	352	387	381	450
Death Certificates by ME	178	180	186	191	200	176	194
Bodies Transported to WMed	138	164	165	176	170	146	172
Complete Autopsy	103	109	103	102	103	81	112
Limited Autopsy	1	5	4	3	8	8	6
External Examination	20	28	36	46	38	32	27
Storage Only at WMed	14	20	22	25	21	25	27
Total Cases with Toxicology	122	131	113	141	139	112	136
Unidentified Remains After Exam	0	0	0	0	0	0	0
Referrals to Gift of Life	119	115	118	146	107	72	102
Tissue Donations	8	3	11	10	11	6	11
Cornea Donations	8	8	11	8	9	3	5
Unclaimed Investigations	13	8	11	23	24	29	40
Exhumations	1	0	0	0	0	0	0

## Cremation Permit Authorizations, Calhoun County

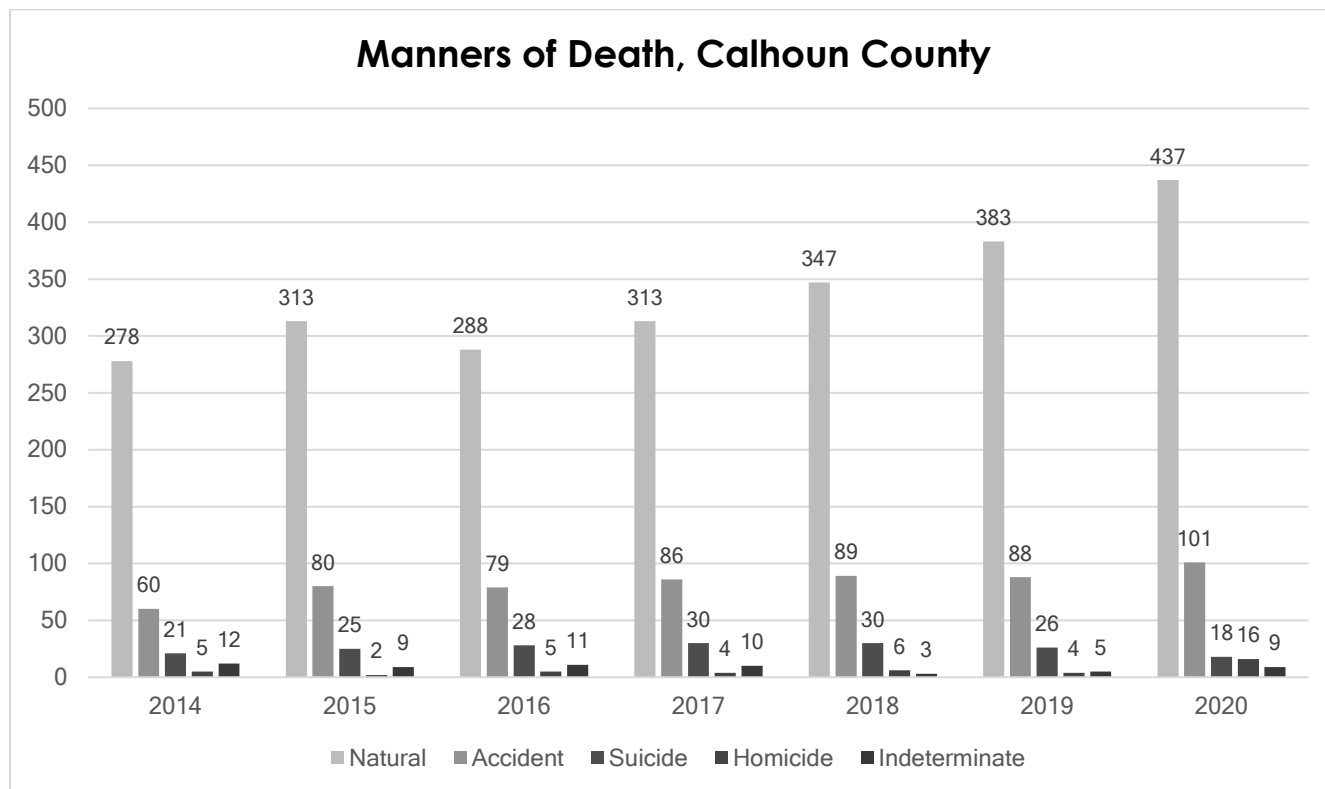
	2014	2015	2016	2017	2018	2019	2020
Cremation Permits	721	742	811	857	901	997	1,176
% of Total Deaths with Cremation	52%	54%	57%	61%	60%	66%	66%

<sup>1</sup> Updated total number of deaths occurring in the county

<sup>2</sup> Provisional total number of deaths occurring in the county

## Manners of Death Reported, Calhoun County

	2014	2015	2016	2017	2018	2019	2020
Natural	278	313	288	313	347	383	437
Accident	60	80	79	86	89	88	101
Suicide	21	25	28	30	30	26	18
Homicide	5	2	5	4	6	4	16
Indeterminate	12	9	11	10	3	5	9 <sup>1</sup>
<b>Total</b>	<b>377</b>	<b>429</b>	<b>411</b>	<b>443</b>	<b>475</b>	<b>506</b>	<b>581<sup>2</sup></b>



<sup>1</sup> (1) Unexplained sudden death (of infant) associated with unsafe sleep and viral infection; (1) Unexplained sudden death (of infant) associated with unsafe sleep and Chiari Type I malformation; (1) Unexplained sudden death (of infant) associated with possible unsafe sleep; (1) Unexplained sudden death (of infant) associated with unsafe sleep, prematurity and pulmonary stenosis; (1) Unexplained sudden death (of infant) associated with unsafe sleep, chronic bronchiolitis and viral infection; (1) Cause and manner of death could not be determined; (2) Mixed drug intoxication; (1) Gunshot wound of thigh;

<sup>2</sup> Does not include (4) Stillbirth investigations (cremation authorizations)

## Deaths Reported by Age (in years), Calhoun County<sup>1</sup>

	< 1	1 - 5	6 - 10	11 - 17	18 – 25	26 - 44	45 - 64	65 +
2014	6	4	0	3	8	34	148	171
2015	4	0	1	6	11	59	128	215
2016	4	0	2	2	9	53	122	208
2017	3	1	1	1	14	65	140	206
2018	1	0	2	2	9	45	164	241
2019	0	0	1	0	12	53	157	283
2020	6	2	0	0	12	63	184	314

## Pediatric Deaths, Calhoun County

The eight deaths of individuals under 18 years of age include:

1. <1 year old
  - a. (1) Craniocerebral trauma; homicide
  - b. (1) Unexplained sudden death (of infant) associated with unsafe sleep and Chiari Type I malformation; indeterminate
  - c. (1) Unexplained sudden death (of infant) associated with unsafe sleep, prematurity and pulmonary stenosis; indeterminate
  - d. (1) Unexplained sudden death (of infant) associated with unsafe sleep, chronic bronchiolitis and viral infection (Rhino/Enterovirus); indeterminate
  - e. (1) Unexplained sudden death (of infant) associated with unsafe sleep and viral infection (Coronavirus HKU1); indeterminate
  - f. (1) Unexplained sudden death (of infant) associated with possible unsafe sleep; indeterminate
2. 1-5 years old
  - a. (1) Multiple injuries; homicide
  - b. (1) Bronchiolitis due to multiple viral respiratory co-infections; natural

<sup>1</sup> All stillbirths and spontaneous abortions (miscarriages) investigated but not requiring an examination have been removed from this table for a more accurate representation of deaths reported under the age of one year.

## Accidental Deaths by Mechanism, Calhoun County

	2014	2015	2016	2017	2018	2019	2020
Vehicle	10	21	20	14	15	15	20
Drug-Related	26	44	38	44	49	40	50 <sup>1</sup>
Drowning	0	2	2	3	1	4	2 <sup>2</sup>
Fall	16	11	14	19	19	20	19 <sup>3</sup>
Fire	5	0	1	0	1	1	0
Environmental Exposure	2	0	0	0	0	3	5 <sup>4</sup>
Asphyxia	2	0	2	5	3	2	4 <sup>5</sup>
Other	1	1	2	1	1	3	1 <sup>6</sup>
<b>Total</b>	<b>62</b>	<b>81</b>	<b>79</b>	<b>86</b>	<b>89</b>	<b>88</b>	<b>101</b>

## Drug-Related Deaths by Manner, Calhoun County<sup>7</sup>

	2014	2015	2016	2017	2018	2019	2020
Accident	26	44	37	44	49	40	50
Suicide	3	2	5	3	3	3	2
Indeterminate	2	2	4	5	2	0	2
<b>Total</b>	<b>31</b>	<b>48</b>	<b>46</b>	<b>52</b>	<b>54</b>	<b>43</b>	<b>54</b>
Total involving opioid(s)	N/A	42	40	48	48	36	46
% of Accidental and Indeterminate Deaths Involving Opioids	N/A	91%	88%	94%	92%	88%	87%

<sup>1</sup> Includes (1) Mixed drug intoxication associated with probable mechanical asphyxia

<sup>2</sup> Includes (1) Drowning (pond), pinned beneath tractor that drove into water

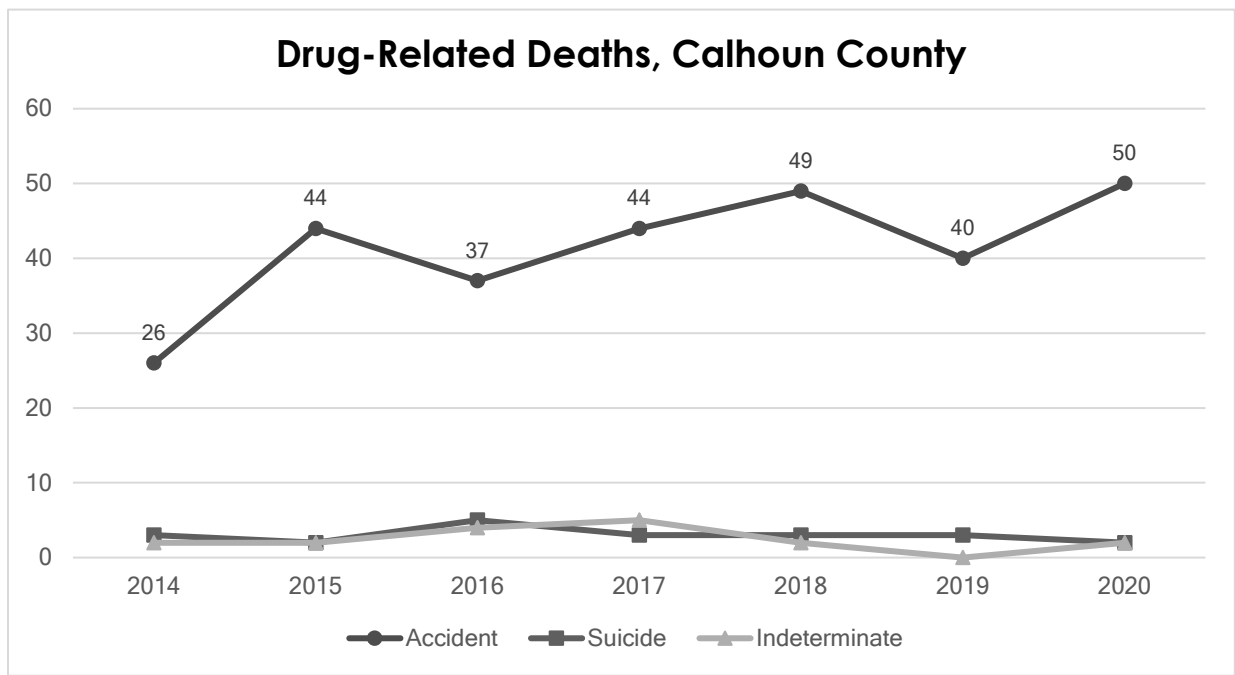
<sup>3</sup> Includes (1) Fall associated with possible choking episode

<sup>4</sup> Includes (1) Probable hypothermia; (1) Hypothermia associated with recent drug use

<sup>5</sup> (4) Choking

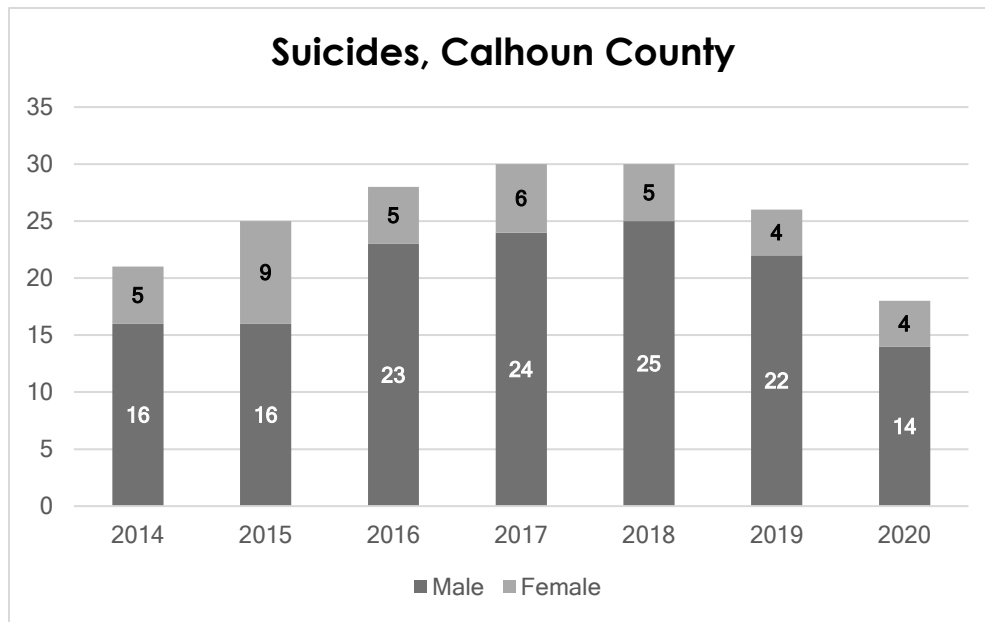
<sup>6</sup> (1) Craniocerebral trauma due to falling tree limb

<sup>7</sup> Acute alcohol intoxications are defined as drug-related deaths and are included in this data.



## Suicides by Sex & Age, Calhoun County

<i>Year</i>	Total	Male	Female	0 - 17	18 - 25	26 - 44	45 - 64	65 +
2014	21	16	5	1	4	7	8	1
2015	25	16	9	2	2	7	7	7
2016	28	23	5	1	2	8	12	5
2017	30	24	6	0	4	12	7	7
2018	30	25	5	1	2	5	15	7
2019	26	22	4	0	4	9	9	4
2020	18	14	4	0	2	9	7	0



### Suicides by Mechanism, Calhoun County

	2014	2015	2016	2017	2018	2019	2020
Firearm	11	14	14	12	17	16	11
Hanging	7	5	6	10	10	5	4
Carbon Monoxide	0	0	2	0	0	0	0
Drug Intoxication	3	2	5	3	3	3	2
Motor Vehicle	0	0	1	2	0	1	1
Sharp Force Trauma	0	0	0	1	0	0	0
Asphyxia/Suffocation	0	2	0	1	0	0	0
Other	0	2	0	1	0	1	0
<b>Total</b>	<b>21</b>	<b>25</b>	<b>28</b>	<b>30</b>	<b>30</b>	<b>26</b>	<b>18</b>

# GRAND TRAVERSE COUNTY

## Summary of All Grand Traverse County Cases

	2017	2018	2019	2020
Total Deaths in the County	1,306	1,413	1,345 <sup>1</sup>	1,571 <sup>2</sup>
Deaths Reported to the ME	380	350	384	495
Deaths Investigated	249	252	278	375
MEI Scene Investigations	122	206	212	211
Death Certificates by ME	153	126	131	158
Bodies Transported to WMed	77	58	65	69
Complete Autopsy	56	45	52	53
Limited Autopsy	2	0	2	3
External Examination	19	13	12 <sup>3</sup>	13
Storage Only at WMed	0	0	0	0
Total Cases with Toxicology	73	53	61	64
Unidentified Remains After Exam	1	2	0	1 <sup>4</sup>
Referrals to Gift of Life	44	37	43	49
Tissue Donations	4	3	1	7
Cornea Donations	4	2	0	2
Unclaimed Investigations	5	7	10	12
Exhumations	0	0	0	0

## Cremation Permit Authorizations, Grand Traverse County

	2017	2018	2019	2020
Cremation Permits	1,005	1,108	1,077	1,283
% of Total Deaths with Cremation	76%	78%	80%	82%

<sup>1</sup> Updated total number of deaths occurring in the county

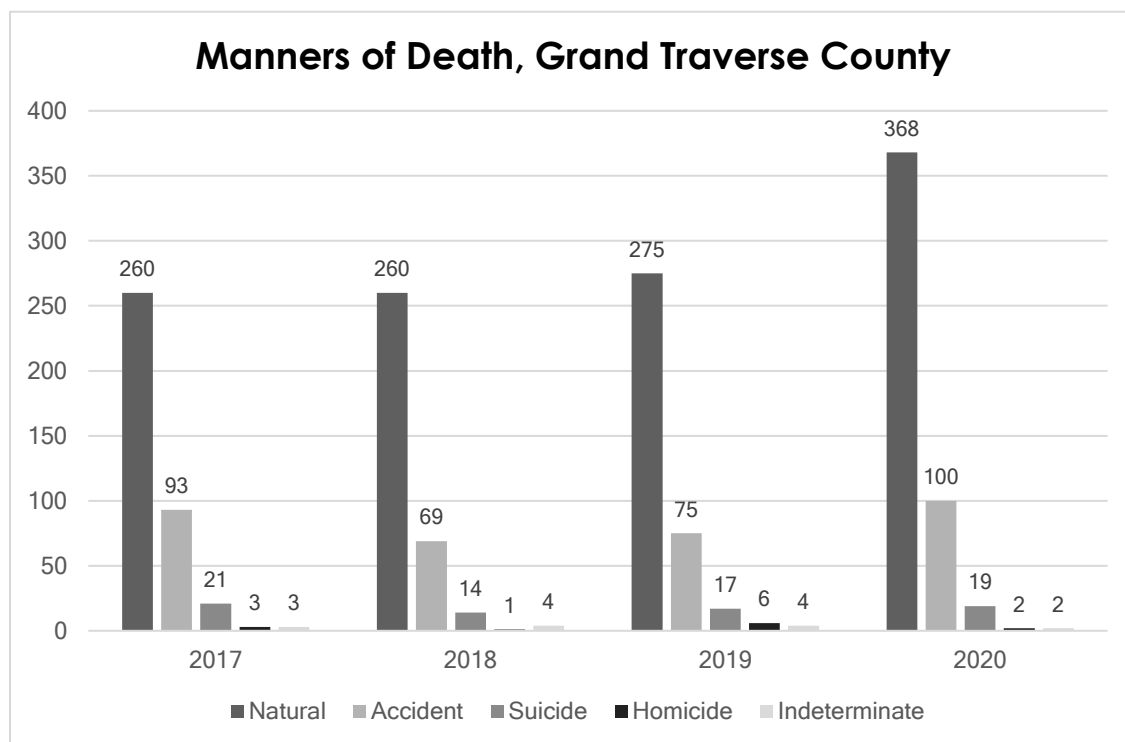
<sup>2</sup> Provisional total number of deaths occurring in the county

<sup>3</sup> Updated to include (1) investigation of death occurring in 2019 but not having examination until 2020.

<sup>4</sup> (1) Femur only, likely historic

## Manners of Death Reported, Grand Traverse County

	2017	2018	2019	2020
Natural	260	260	275	368
Accident	93	69	75	100
Suicide	21	14	17	19
Homicide	3	1	6	2
Indeterminate	3	4	4	2 <sup>1</sup>
<b>Total</b>	<b>380</b>	<b>348</b>	<b>377</b>	<b>491<sup>2</sup></b>



## Deaths Reported by Age (in years), Grand Traverse County<sup>3</sup>

	< 1	1 - 5	6 - 10	11 - 17	18 - 25	26 - 44	45 - 64	65 +
2017	0	0	0	0	7	32	94	229
2018	5	0	0	2	7	22	85	216
2019	4	0	0	4	3	34	94	238
2020 <sup>4</sup>	7	0	0	1	10	37	122	314

<sup>1</sup> (1) Unexplained sudden death (of infant) associated with unsafe sleep; (1) Hanging

<sup>2</sup> Does not include (3) Stillbirth investigations (cremation authorizations); (1) Femur only, likely historic

<sup>3</sup> All stillbirths and spontaneous abortions (miscarriages) investigated but not requiring an examination have been removed from this table for a more accurate representation of deaths reported under the age of one year.

<sup>4</sup> Does not include (1) Femur only, likely historic

## Pediatric Deaths, Grand Traverse County

The eight deaths of individuals under 18 years of age include:

1. <1 year old
  - a. (5) Prematurity; natural
  - b. (1) Unexplained sudden death (of infant) associated with unsafe sleep; indeterminate
  - c. (1) Trisomy 18; natural
2. 11-17 years old
  - a. (1) Hanging; indeterminate

## Accidental Deaths by Mechanism, Grand Traverse County

	2017	2018	2019	2020
Vehicle	23	15	22	18 <sup>1</sup>
Drug-Related	19	9	10	19 <sup>2</sup>
Drowning	2	2	2	6 <sup>3</sup>
Fall	44	35	34	47 <sup>4</sup>
Fire	2	1	1	1
Environmental Exposure	0	1	0	4
Asphyxia	1	3	4	3 <sup>5</sup>
Other	2	3	2	2 <sup>6</sup>
<b>Total</b>	<b>93</b>	<b>69</b>	<b>75</b>	<b>100</b>

## Drug-Related Deaths by Manner, Grand Traverse County<sup>7</sup>

	2017	2018	2019	2020
Accident	19	9	10	19
Suicide	4	1	2	3
Indeterminate	0	0	0	0
<b>Total</b>	<b>23</b>	<b>10</b>	<b>12</b>	<b>22</b>
Total involving opioid(s)	18	8	8	15
% of Accidental and Indeterminate Deaths Involving Opioids	84%	89%	70%	68%

<sup>1</sup> Includes (1) Multiple injuries with acute alcohol intoxication, snowmobile collision

<sup>2</sup> Includes (1) Acute drug intoxication associated with hypothermia; (1) Acute and chronic alcohol use associated with blunt force injuries due to fall

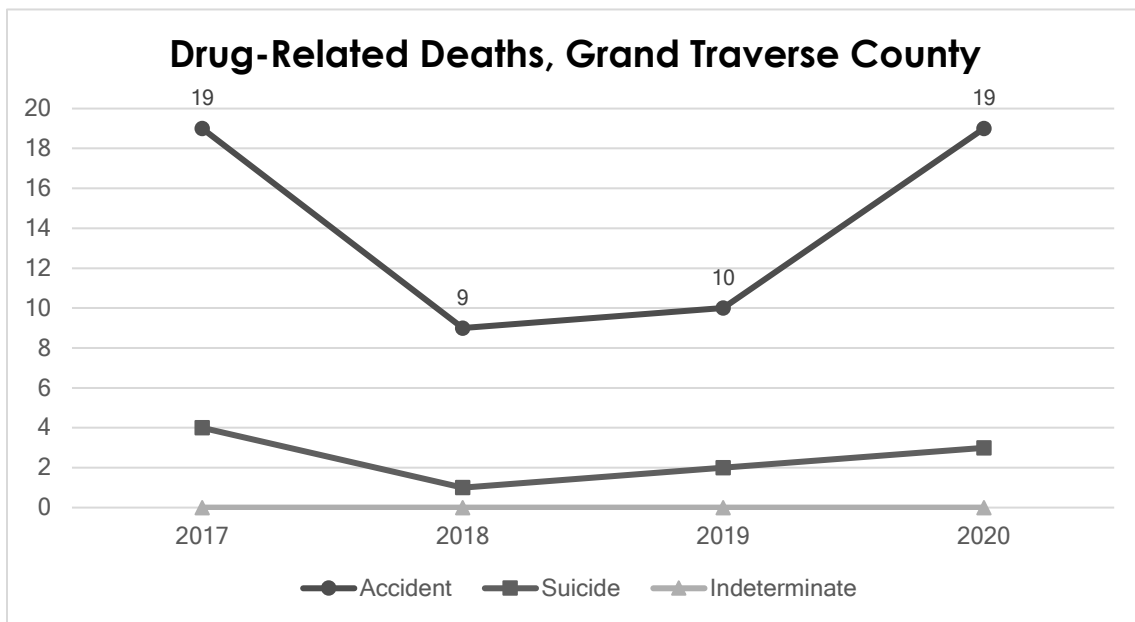
<sup>3</sup> Includes (1) Drowning (lake) associated with neck injury due to dive into water

<sup>4</sup> Includes (1) Fall due to coughing episode

<sup>5</sup> (1) Airway obstruction associated with epilepsy; (1) Probable positional asphyxia; (1) Pinned beneath motor vehicle

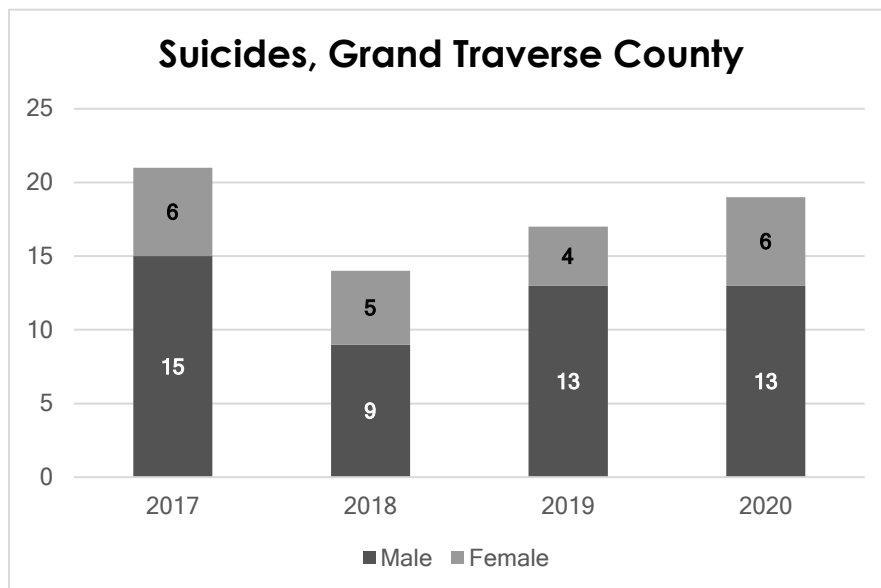
<sup>6</sup> (2) Blunt force head injuries due to falling tree limb

<sup>7</sup> Acute alcohol intoxications are defined as drug-related deaths and are included in this data.



## Suicides by Sex & Age, Grand Traverse County

Year	Total	Male	Female	0 - 17	18 - 25	26 - 44	45 - 64	65 +
2017	21	15	6	0	3	3	9	6
2018	14	9	5	2	1	6	5	0
2019	17	13	4	3	0	9	3	2
2020	19	13	6	0	3	8	7	1



## Suicides by Mechanism, Grand Traverse County

	2017	2018	2019	2020
Firearm	11	5	9	7
Hanging	4	5	4	5
Carbon Monoxide	0	0	1	0
Drug Intoxication	4	1	2	3
Motor Vehicle	1	1	0	1
Sharp Force Trauma	1	1	0	3
Asphyxia/Suffocation	0	0	0	0
Other	0	1	1	0
<b>Total</b>	<b>21</b>	<b>14</b>	<b>17</b>	<b>19</b>

# KALAMAZOO COUNTY

## Summary of All Kalamazoo County Cases

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total Deaths in the County	2,582	2,540	2,668	2,684	2,733	2,879	2,840	2,977	2,921 <sup>1</sup>	3,444 <sup>2</sup>
Deaths Reported to the ME	828	778	777	750	810	975	991	1,068	1,060	1,242
Deaths Investigated	N/A	556	580	560	646	745	733	782	781	931
MEI Scene Investigations	498	503	549	411	434	560	627	677	650	746
Death Certificates by ME	394	362	358	355	306	390	406	405	401	449
Bodies Transported to WMed	244	233	241	253	247	318	307	330	290	302
Complete Autopsy	178	187	193	174	142	192	189	187	180	188
Limited Autopsy	10	4	4	6	7	7	4	9	7	6
External Examination	50	34	37	37	52	60	64	68	62	60
Storage Only at WMed	6	8	7	36	46	59	50	62	41	44
Total Cases with Toxicology	198	212	222	198	174	222	238	238	224	236
Unidentified Remains After Exam	14	0	0	0	0	0	0	1	0	1 <sup>3</sup>
Referrals to Gift of Life	9	46	65	95	113	161	156	129	136	161
Tissue Donations	3	4	4	6	9	22	16	16	17	17
Cornea Donations	2	4	9	9	9	20	10	7	7	10
Unclaimed Investigations	14	9	7	10	10	10	13	41	40	48
Exhumations	0	0	0	0	0	1	0	0	0	0

## Cremation Permit Authorizations, Kalamazoo County

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Cremation Permits	1,485	1,467	1,740	1,782	1,672	1,856	1,920	2,101	2,028	2,492
% of Total Deaths with Cremation	58%	58%	65%	66%	61%	64%	68%	71%	70%	72%

<sup>1</sup> Updated total number of deaths occurring in the county

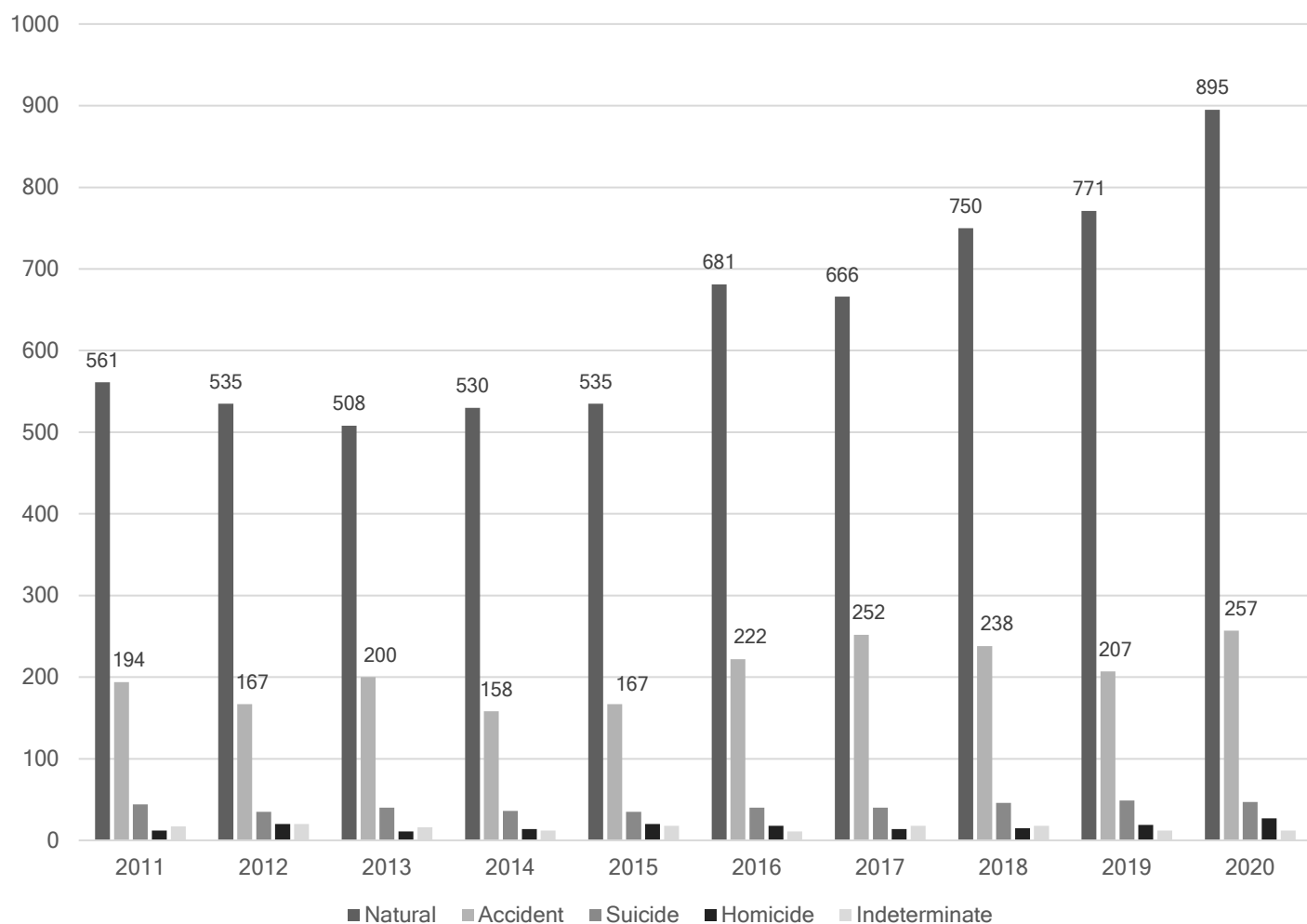
<sup>2</sup> Provisional total number of deaths occurring in the county

<sup>3</sup> (1) Possible cremains, unknown if human

## Manners of Death Reported, Kalamazoo County

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Natural	561	535	508	530	588	681	666	750	771	895
Accident	194	167	200	158	151	222	252	238	207	257
Suicide	44	35	40	36	38	40	40	46	49	47
Homicide	12	20	11	14	14	18	14	15	19	27
Indeterminate	17	20	16	12	19	11	18	17	12	12 <sup>1</sup>
<b>Total</b>	<b>828</b>	<b>777</b>	<b>775</b>	<b>750</b>	<b>810</b>	<b>971</b>	<b>990</b>	<b>1066</b>	<b>1058</b>	<b>1238<sup>2</sup></b>

### Manners of Death, Kalamazoo County



<sup>1</sup> (1) Complications of head trauma (unknown etiology) and acute meningitis associated with chronic alcohol use and hypertensive cardiovascular disease; (1) Mixed drug intoxication; (1) Complications of injuries and natural disease due to fall down stairs; (1) Multiple injuries due to fall from height; (1) Gunshot wound of head; (1) Multiple blunt force injuries due to motor vehicle collision; (2) Multiple injuries, pedestrian struck by motor vehicle; (1) Natural disease complicated by blunt head injury (unknown etiology); (1) Unexplained sudden death (of infant) associated with unsafe sleep and illicit drug exposure; (2) Unexplained sudden death (of infant) associated with unsafe sleep

<sup>2</sup> Does not include (3) Stillbirth investigations (cremation authorizations); (1) Possible cremains, unknown if human

## Deaths Reported by Age (in years), Kalamazoo County<sup>1</sup>

	< 1	1 - 5	6 - 10	11 - 17	18 - 25	26 - 44	45 - 64	65 +
2011	9	6	2	3	32	74	240	461
2012	12	4	3	7	34	79	235	403
2013	14	8	0	11	29	76	209	429
2014	7	3	5	5	29	61	239	399
2015	14	5	3	7	21	82	220	441
2016	5	5	3	12	37	95	269	494
2017	15	6	3	10	35	103	259	513
2018	13	5	1	9	23	97	297	571
2019	6	6	3	5	37	98	293	610
2020	11	4	4	9	28	130	343	709

## Pediatric Deaths, Kalamazoo County

The 28 deaths of individuals under 18 years of age include:

1. <1 year old
  - a. (2) Prematurity; natural
  - b. (2) Unexplained sudden death (of infant) associated with unsafe sleep; indeterminate
  - c. (1) Complications of congenital heart defect; natural
  - d. (1) Complications of multiple congenital anomalies and chromosomal abnormality; natural
  - e. (1) Complications of Hirschsprung's disease; natural
  - f. (1) Asphyxia due to unsafe sleep; accident
  - g. (1) Complications of traumatic brain injury; homicide
  - h. (1) Bacterial pneumonia associated with empyema, pericarditis, sepsis; natural
  - i. (1) Unexplained sudden death (of infant) associated with unsafe sleep and illicit drug exposure; indeterminate
2. 1-5 years old
  - a. (1) Embryonic brain tumor; natural
  - b. (1) Complications of multiple injuries, including asphyxia; homicide
  - c. (1) Complications of multiple injuries, including craniocerebral trauma; homicide
  - d. (1) Multiple injuries; homicide
3. 6-10 years old
  - a. (1) Cerebral palsy associated with seizure disorder; natural
  - b. (1) Cerebral palsy associated with seizure disorder and bronchitis/bronchiolitis; natural
  - c. (1) Blunt force head injury, struck by liftgate of truck; accident
  - d. (1) Multiple injuries, including craniocerebral trauma; homicide
4. 11-17 years old
  - a. (2) Multiple blunt force injuries, passenger in roll-over motor vehicle collision; accident

<sup>1</sup> All stillbirths and spontaneous abortions (miscarriages) investigated but not requiring an examination have been removed from this table for a more accurate representation of deaths reported under the age of one year.

- b. (1) Complications of shunt obstruction; natural
- c. (1) Complications of restraint asphyxia; homicide
- d. (1) Hanging; suicide
- e. (1) Mechanical asphyxia due to trench collapse; accident
- f. (1) Gunshot wound of head; suicide
- g. (1) Intraoral shotgun wound of head; suicide
- h. (1) Acute and chronic asthmatic bronchitis; natural

## Accidental Deaths by Mechanism, Kalamazoo County

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Vehicle	46	48	60	35	46	58	72	51	45	40 <sup>1</sup>
Drug-Related	33	34	47	35	33	72	61	63	47	69 <sup>2</sup>
Drowning	5	2	2	3	1	4	7	9	5	5 <sup>3</sup>
Fall	92	67	76	77	57	80	92	100	85	123 <sup>4</sup>
Fire	5	2	8	3	3	4	5	4	5	6 <sup>5</sup>
Environmental Exposure	2	4	1	1	1	1	2	3	5	5 <sup>6</sup>
Asphyxia	6	3	4	2	7	3	6	6	12	6 <sup>7</sup>
Other	6	7	3	4	3	1	7	3	3	3 <sup>8</sup>
<b>Total</b>	<b>195</b>	<b>167</b>	<b>200</b>	<b>160</b>	<b>151</b>	<b>223</b>	<b>252</b>	<b>238<sup>9</sup></b>	<b>207</b>	<b>257</b>

<sup>1</sup> Includes (1) Pedestrian swimmer struck by watercraft propeller

<sup>2</sup> Includes (1) Mixed drug intoxication associated with hypothermia

<sup>3</sup> Includes (1) Drowning (river) associated with mixed drug intoxication

<sup>4</sup> Includes (1) Fall down stairs associated with alcohol use; (1) Fall associated with COVID-19 infection

<sup>5</sup> Includes (1) Smoke and soot inhalation with thermal injuries associated with acute alcohol intoxication

<sup>6</sup> Includes (1) Hypothermia associated with carbon monoxide intoxication

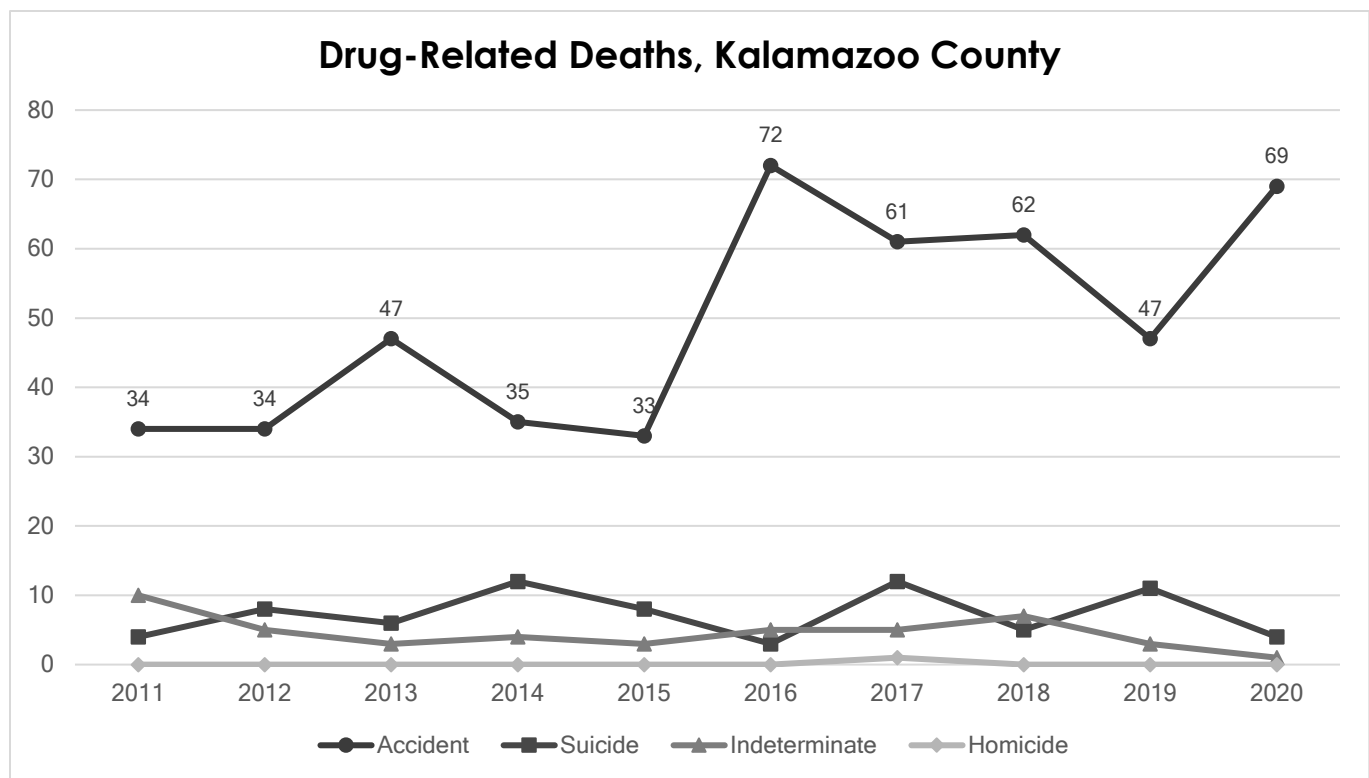
<sup>7</sup> Includes (1) Positional asphyxia associated with acute and chronic alcohol use; (1) Choking; (1) Positional asphyxia associated with tracheostomy obstruction and acute alcohol intoxication; (1) Unsafe sleep (infant); (1) Probable positional asphyxia associated with acute alcohol intoxication; (1) Mechanical asphyxia due to trench collapse

<sup>8</sup> (1) Carbon monoxide intoxication; (1) Blunt force head injury, struck by liftgate of truck; (1) Multiple blunt force injuries due to crush injury by metal oil tank

<sup>9</sup> (1) death is categorized twice (drowning and vehicle-related; vehicle left roadway and entered water )

## Drug-Related Deaths by Manner, Kalamazoo County<sup>1</sup>

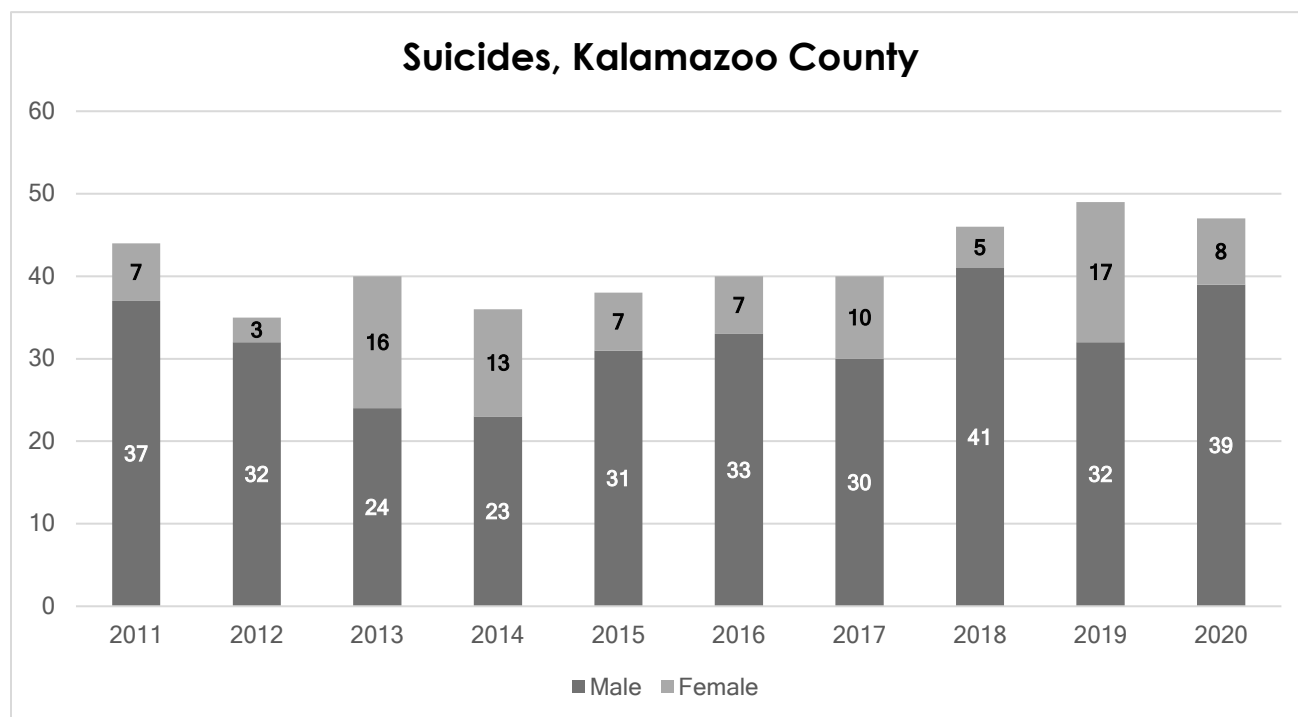
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Accident	34	34	47	35	33	72	61	63	47	69
Suicide	4	8	6	12	8	3	12	5	11	4
Homicide	0	0	0	0	0	0	1	0	0	0
Indeterminate	10	5	3	4	3	5	5	7	3	1
<b>Total</b>	<b>48</b>	<b>47</b>	<b>56</b>	<b>51</b>	<b>44</b>	<b>80</b>	<b>79</b>	<b>75</b>	<b>61</b>	<b>74</b>
Total involving opioid(s)	N/A	N/A	N/A	N/A	30	64	59	51	32	56
% of Accidents and Indeterminate Deaths Involving Opioids	N/A	N/A	N/A	N/A	83%	82%	74%	73%	60%	80%



<sup>1</sup> Acute alcohol intoxications are defined as drug-related deaths and are included in this data.

## Suicides by Sex & Age, Kalamazoo County

Year	Total	Male	Female	0 - 17	18 - 25	26 - 44	45 - 64	65 +
2011	44	37	7	0	7	13	16	8
2012	35	32	3	1	3	11	12	8
2013	40	24	16	5	12	4	12	7
2014	36	23	13	0	7	12	10	7
2015	38	31	7	3	6	8	14	7
2016	40	33	7	3	7	13	12	5
2017	40	30	10	1	3	14	14	8
2018	46	41	5	2	9	11	11	13
2019	49	32	17	3	13	14	13	6
2020	47	39	8	3	5	15	19	5



## Suicides by Mechanism, Kalamazoo County

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Firearm	20	15	15	14	19	19	14	26	22	21
Hanging	12	8	13	7	9	13	12	13	12	21
Carbon Monoxide	2	1	0	0	1	2	0	0	0	1
Drug Intoxication	4	8	6	12	8	3	12	5	11	4 <sup>1</sup>
Motor Vehicle	0	0	1	1	1	0	0	0	2	0
Sharp Force Trauma	3	1	2	0	0	2	2	0	0	0
Asphyxia/Suffocation	1	1	3	1	0	0	0	1	1	0
Other	1	1	0	1	0	1	0	1	1	0
<b>Total</b>	<b>44</b>	<b>35</b>	<b>40</b>	<b>36</b>	<b>38</b>	<b>40</b>	<b>40</b>	<b>46</b>	<b>49</b>	<b>47</b>

<sup>1</sup> Includes (1) alcohol ingestion, including hand sanitizer

# LEELANAU COUNTY

## Summary of All Leelanau County Cases

	2017	2018	2019	2020
Total Deaths in the County	148	175	145	187 <sup>1</sup>
Deaths Reported to the ME	39	46	33	45
Deaths Investigated	36	45	33	44
MEI Scene Investigations	24	41	28	31
Death Certificates by ME	21	15	13	11
Bodies Transported to Morgue	10	9	8	7
Complete Autopsy	9	7	6	1
Limited Autopsy	1	0	0	0
External Examination	0	2	2	6
Storage Only	0	0	0	0
Total Cases with Toxicology	10	8	8	6
Unidentified Remains After Exam	0	0	0	0
Referrals to Gift of Life	6	8	6	7
Tissue Donations	0	1	1	1
Cornea Donations	0	0	0	0
Unclaimed Investigations	0	0	0	0
Exhumations	0	0	0	0

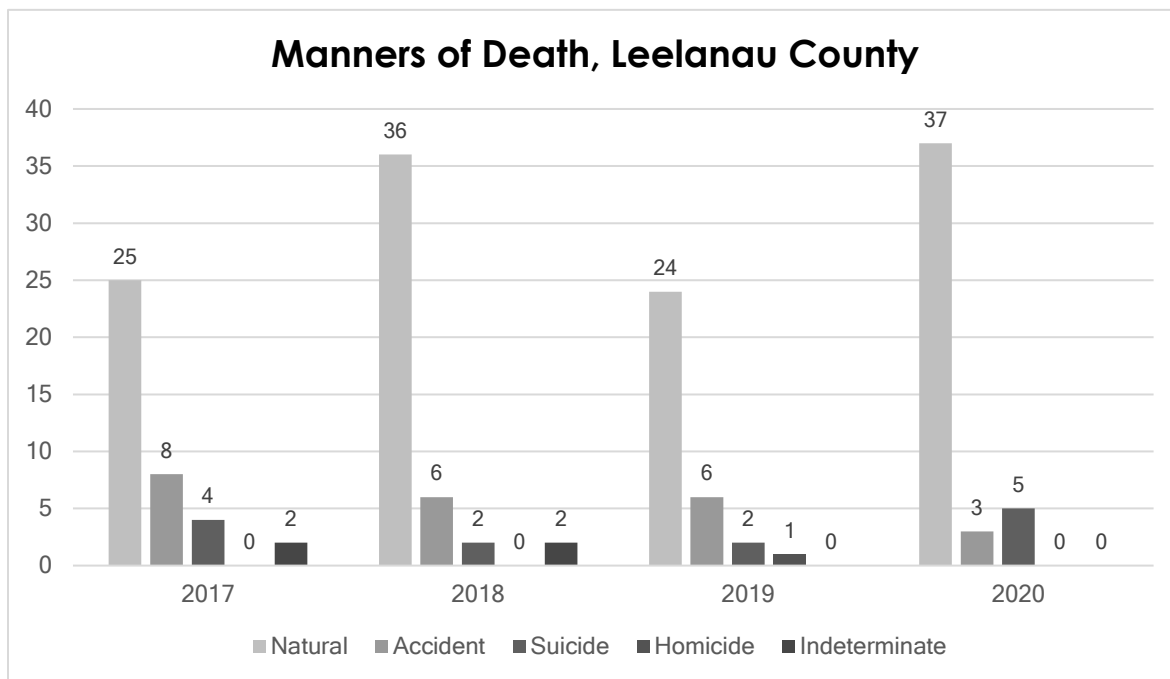
## Cremation Permit Authorizations, Leelanau County

	2017	2018	2019	2020
Cremation Permits	105	130	102	132
% of Total Deaths with Cremation	71%	74%	70%	71%

<sup>1</sup> Provisional total number of deaths occurring in the county

## Manners of Death Reported, Leelanau County

	2017	2018	2019	2020
Natural	25	36	24	37
Accident	8	6	6	3
Suicide	4	2	2	5
Homicide	0	0	1	0
Indeterminate	2	2	0	0
<b>Total</b>	<b>39</b>	<b>46</b>	<b>33</b>	<b>45</b>



## Deaths Reported by Age (in years), Leelanau County<sup>1</sup>

	< 1	1 - 5	6 - 10	11 - 17	18 - 25	26 - 44	45 - 64	65 +
2017	0	0	0	1	3	3	7	25
2018	0	0	1	0	1	3	7	34
2019	0	0	0	0	1	2	5	25
2020	0	0	0	0	0	2	10	33

<sup>1</sup> All stillbirths and spontaneous abortions (miscarriages) investigated but not requiring an examination have been removed from this table for a more accurate representation of deaths reported under the age of one year.

## Accidental Deaths by Mechanism, Leelanau County

	2017	2018	2019	2020
Vehicle	2	1	3	1
Drug-Related	1	1	0	1
Drowning	0	2	2	0
Fall	0	1	1	0
Fire	0	0	0	0
Environmental Exposure	0	0	0	0
Asphyxia	0	1	0	1 <sup>1</sup>
Other	1	0	0	0
<b>Total</b>	<b>4</b>	<b>6</b>	<b>6</b>	<b>3</b>

## Drug-Related Deaths by Manner, Leelanau County<sup>2</sup>

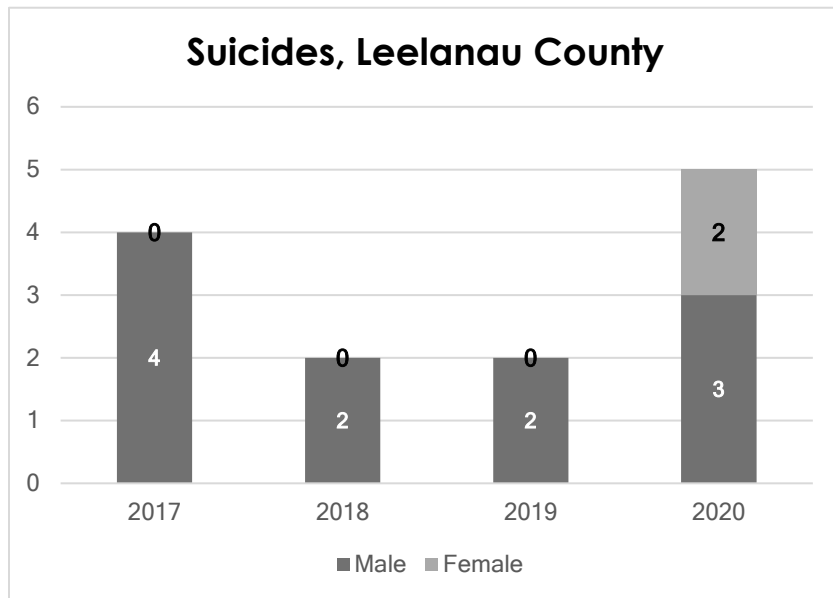
	2017	2018	2019	2020
Accident	1	1	0	1
Suicide	0	0	0	0
Indeterminate	0	0	0	0
<b>Total</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>
Total involving opioid(s)	1	0	0	1
% of Accidents and Indeterminate Manners Involving Opioids	100%	0%	0%	100%

## Suicides by Sex & Age, Leelanau County

Year	Total	Male	Female	0 - 17	18 - 25	26 - 44	45 - 64	65 +
2017	4	4	0	1	0	0	1	2
2018	2	2	0	0	0	0	0	2
2019	2	2	0	0	0	1	1	0
2020	5	3	2	0	0	1	1	3

<sup>1</sup> (1) Choking

<sup>2</sup> Acute alcohol intoxications are defined as drug-related deaths and are included in this data.



## Suicides by Mechanism, Leelanau County

	2017	2018	2019	2020
Firearm	2	2	2	3
Hanging	1	0	0	2 <sup>1</sup>
Carbon Monoxide	0	0	0	0
Drug Intoxication	0	0	0	0
Motor Vehicle	0	0	0	0
Sharp Force Trauma	0	0	0	0
Asphyxia/Suffocation	0	0	0	0
Other	1	0	0	0
<b>Total</b>	<b>4</b>	<b>2</b>	<b>2</b>	<b>2</b>

<sup>1</sup> Includes (1) Hanging associated with acute drug intoxication

# MASON COUNTY

## Summary of All Mason County Cases

	2018	2019	2020
Total Deaths in the County	311	287	344 <sup>1</sup>
Deaths Reported to the ME	107	110	111
Deaths Investigated	92	93	97
MEI Scene Investigations	88	84	83
Death Certificates by ME	53	52	34
Bodies Transported to Morgue	37	34	22
Complete Autopsy	29	25	12
Limited Autopsy	0	0	3
External Examination	6	7	7
Storage Only	2	2	0
Total cases with Toxicology	32	31	21
Unidentified Remains After Exam	0	0	1 <sup>2</sup>
Referrals to Gift of Life	16	10	19
Tissue Donations	3	2	0
Cornea Donations	0	1	0
Unclaimed Investigations	1	0	0
Exhumations	0	0	0

## Cremation Permit Authorizations, Mason County

	2018	2019	2020
Cremation Permits	231	224	288
% of Total Deaths with Cremation	74%	78%	84%

<sup>1</sup> Provisional total number of deaths occurring in the county

<sup>2</sup> Human skeletal remains recovered from eroding shoreline, multiple decedents (likely historic cemetery)

## Manners of Death Reported, Mason County

	2018	2019	2020
Natural	84	82	85
Accident	16	24	17
Suicide	7	2	8
Homicide	0	1	0
Indeterminate	0	1	0
<b>Total</b>	<b>107</b>	<b>110</b>	<b>110<sup>1</sup></b>

## Deaths Reported by Age (in years), Mason County<sup>2</sup>

	< 1	1 - 5	6 - 10	11 - 17	18 - 25	26 - 44	45 - 64	65 +
2018	0	0	0	3	2	13	25	63
2019	0	0	0	1	5	7	30	67
2020 <sup>3</sup>	0	0	0	0	1	10	28	71

## Accidental Deaths by Mechanism, Mason County

	2018	2019	2020
Vehicle	5	6	4
Drug-Related	7	2	5
Drowning	1	7	2
Fall	3	6	4
Fire	0	0	0
Environmental Exposure	0	3	0
Asphyxia	0	0	1
Other	0	0	1 <sup>4</sup>
<b>Total</b>	<b>16<sup>5</sup></b>	<b>24</b>	<b>17</b>

<sup>1</sup> Does not include (1) Human skeletal remains recovered from eroding shoreline, multiple decedents (likely historic cemetery)

<sup>2</sup> All stillbirths and spontaneous abortions (miscarriages) investigated but not requiring an examination have been removed from this table for a more accurate representation of deaths reported under the age of one year.

<sup>3</sup> Does not include (1) Human skeletal remains recovered from eroding shoreline, multiple decedents (likely historic cemetery)

<sup>4</sup> (1) Carbon monoxide intoxication

<sup>5</sup> (1) death is categorized twice (drug-related and environmental exposure)

## Drug-Related Deaths by Manner, Mason County<sup>1</sup>

	2018	2019	2020
Accident	7	2	5
Suicide	1	0	0
Indeterminate	0	1	0
<b>Total</b>	<b>8</b>	<b>3</b>	<b>5</b>
Total involving opioid(s)	4	1	5
% of Accidents and Indeterminate Deaths Involving Opioids	57%	33%	100%

## Suicides by Sex & Age, Mason County

Year	Total	Male	Female	0 - 17	18 - 25	26 - 44	45 - 64	65 +
2018	7	4	3	1	0	3	3	0
2019	2	1	1	0	1	1	0	0
2020	8	8	0	0	0	2	4	2

## Suicides by Mechanism, Mason County

	2018	2019	2020
Firearm	2	2	6
Hanging	4	0	2
Carbon Monoxide	0	0	0
Drug Intoxication	1	0	0
Motor Vehicle	0	0	0
Sharp Force Trauma	0	0	0
Asphyxia/Suffocation	0	0	0
Other	0	0	0
<b>Total</b>	<b>7</b>	<b>2</b>	<b>8</b>

<sup>1</sup> Acute alcohol intoxications are defined as drug-related deaths and are included in this data.

# MUSKEGON COUNTY

## Summary of All Muskegon County Cases

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total Deaths in the County	1,625	1,693	1,600	1,730	1,707	1,784	1,759	1,784	1,841	1,846 <sub>1</sub>	2,220 <sub>2</sub>
Deaths Reported to the ME	544	440	481	527	524	605	585	629	662	670	804
Deaths Investigated	N/A	N/A	412	424	453	530	504	468	504	523	628
MEI Scene Investigations	353	310	384	420	444	501	469	425	463	467	538
Death Certificates by ME	213	201	203	216	228	251	231	234	235	248	255
Bodies Transported to Morgue	163	161	132	148	178	159	167	159	161	177	167
Complete Autopsy	135	122	106	120	144	120	114	108	117	134	125
Limited Autopsy	5	10	2	6	2	4	2	4	4	5	4
External Examination	22	21	22	18	18	35	41	43	35	30	34
Storage Only	1	8	2	4	4	0	10	4	4	8	4
Total Cases with Toxicology	147	153	119	142	152	160	136	140	147	160	158
Unidentified Remains After Exam	0	0	0	0	0	0	0	0	0	0	0
Referrals to Gift of Life	27	70	81	93	156	139	109	122	128	104	137
Tissue Donations	3	7	8	9	14	17	12	9	15	12	9
Cornea Donations	3	8	11	12	16	20	11	7	8	6	4
Unclaimed Investigations	0	4	4	3	6	5	7	12	15	14	19
Exhumations	0	0	0	0	0	0	0	0	0	0	0

<sup>1</sup> Updated total number of deaths occurring in the county

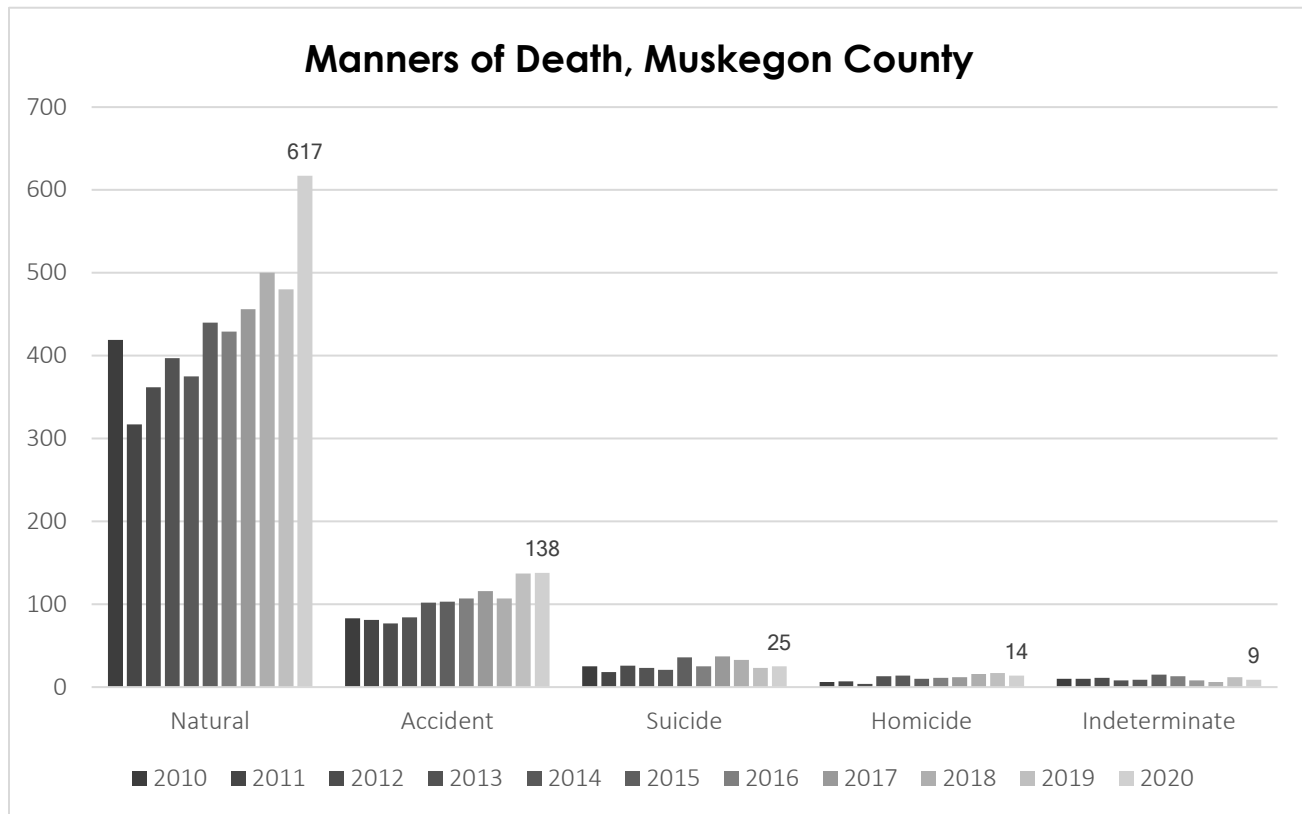
<sup>2</sup> Provisional total number of deaths occurring in the county

## Cremation Permit Authorizations, Muskegon County

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Cremation Permits	893	812	952	986	1,007	1,116	1,138	1,188	1,264	1,383	1,600
% of Total Deaths with Cremation	55%	48%	60%	57%	59%	63%	65%	67%	68%	75%	72%

## Manners of Death Reported, Muskegon County

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Natural	419	317	362	397	375	440	429	456	500	480	617
Accident	83	81	77	84	102	103	107	116	107	137	138
Suicide	25	18	26	23	21	36	25	37	33	23	25
Homicide	6	7	4	13	14	10	11	12	16	17	14
Indeterminate	10	10	11	8	9	15	13	8	6	12	9 <sup>1</sup>
<b>Total</b>	<b>544</b>	<b>440</b>	<b>480</b>	<b>525</b>	<b>524</b>	<b>604</b>	<b>585</b>	<b>629</b>	<b>662</b>	<b>669</b>	<b>803<sup>2</sup></b>



<sup>1</sup> (1) Hanging; (2) Drowning (lake); (2) Unexplained sudden death (of infant) associated with unsafe sleep; (1) Drowning (sink) associated with natural and psychiatric disease; (1) Multiple blunt force injuries due to motor vehicle collision; (1) Unexplained sudden death (of infant) associated with probable unsafe sleep and illicit drug exposure; (1) Unexplained sudden death (of infant) associated with unsafe sleep and prematurity

<sup>2</sup> Does not include (1) Stillbirth investigation (cremation authorization)

## Deaths Reported by Age (in years), Muskegon County<sup>1</sup>

	< 1	1 - 5	6 - 10	11 - 17	18 - 25	26 - 44	45 - 64	65 +
2010	8	0	2	4	11	47	151	306
2011	3	1	1	4	14	59	134	217
2012	4	3	1	3	14	44	144	267
2013	5	0	0	4	13	48	170	286
2014	4	0	0	8	15	66	155	273
2015	9	1	2	2	24	61	199	304
2016	4	2	1	5	18	55	184	303
2017	3	1	0	8	14	81	168	344
2018	1	2	3	1	16	88	190	344
2019	2	0	0	1	22	74	177	393
2020	6	0	1	6	16	87	199	488

## Pediatric Deaths, Muskegon County

The 13 deaths of individuals under 18 years of age include:

1. <1 year old
  - a. (2) Unexplained sudden death (of infant) associated with unsafe sleep; indeterminate
  - b. (1) Asphyxia due to unsafe sleep; accident
  - c. (1) Multiple injuries, including head and neck trauma; homicide
  - d. (1) Unexplained sudden death (of infant) associated with probable unsafe sleep and illicit drug exposure; indeterminate
  - e. (1) Unexplained sudden death (of infant) associated with unsafe sleep and prematurity; indeterminate
2. 6-10 years old
  - a. (1) Multiple blunt force injuries, passenger in motor vehicle collision; accident
3. 11-17 years old
  - a. (3) Multiple gunshot wounds; homicide
  - b. (1) Complications of Goldenhar syndrome; natural
  - c. (1) Complications of cerebral palsy; natural
  - d. (1) Multiple blunt force injuries, unrestrained driver in motor vehicle collision; accident

<sup>1</sup> All stillbirths and spontaneous abortions (miscarriages) investigated but not requiring an examination have been removed from this table for a more accurate representation of deaths reported under the age of one year.

## Accidental Deaths by Mechanism, Muskegon County

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Vehicle	16	25	18	13	18	22	22	22	21	33	27
Drug-Related	31	30	20	37	47	39	40	47	40	46	57 <sup>1</sup>
Drowning	3	4	4	4	4	4	2	4	2	5	4 <sup>2</sup>
Fall	21	17	27	26	29	29	32	38	37	43	38
Fire	3	3	0	0	1	3	1	0	0	1	3
Environmental Exposure	0	0	0	0	1	1	4	0	1	2	4 <sup>3</sup>
Asphyxia	6	1	4	2	2	3	4	2	5	4	4 <sup>4</sup>
Other	2	1	3	0	1	2	2	3	2	3	1 <sup>5</sup>
<b>Total</b>	<b>82</b>	<b>81</b>	<b>76</b>	<b>82</b>	<b>103</b>	<b>103</b>	<b>107</b>	<b>116</b>	<b>107<sup>6</sup></b>	<b>137</b>	<b>138</b>

## Drug-Related Deaths by Manner, Muskegon County<sup>7</sup>

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Accident	31	30	20	37	47	39	39	47	40	46	57
Suicide	9	3	5	1	2	7	3	4	10	4	3
Indeterminate	5	3	2	2	5	4	6	3	1	5	0
<b>Total</b>	<b>45</b>	<b>36</b>	<b>27</b>	<b>40</b>	<b>54</b>	<b>50</b>	<b>48</b>	<b>54</b>	<b>51</b>	<b>55</b>	<b>60</b>
Total involving opioid(s)	N/A	N/A	N/A	N/A	N/A	43	41	43	39	43	50
% of Accidents and Indeterminate Deaths Involving Opioids	N/A	N/A	N/A	N/A	N/A	95%	87%	84%	85%	84%	88%

<sup>1</sup> Includes (1) Mixed drug intoxication associated with probable hypothermia

<sup>2</sup> Includes (1) Drowning (shower) associated with substance abuse

<sup>3</sup> Includes (1) Hypothermia associated with acute and chronic alcohol use and natural disease

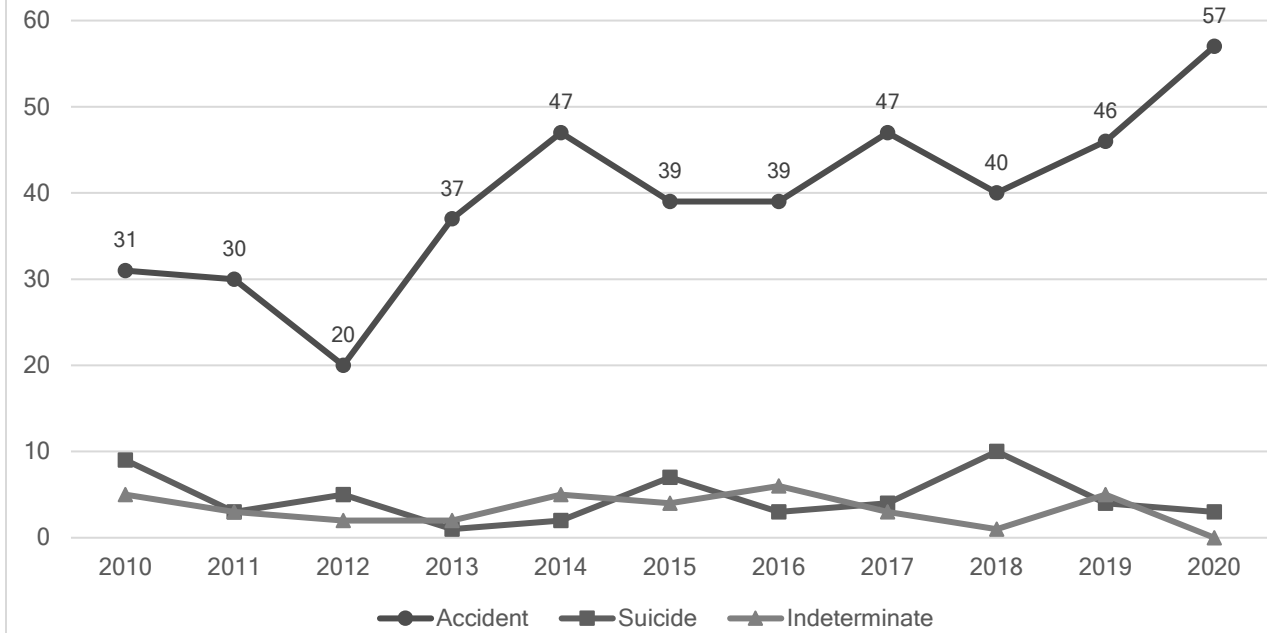
<sup>4</sup> Includes (1) Overlay (unsafe sleep); (1) Choking; (1) Pinned beneath vehicle; (1) Pinned beneath tractor

<sup>5</sup> (1) Surgical complication

<sup>6</sup> (1) Death is categorized twice (drug-related and drowning)

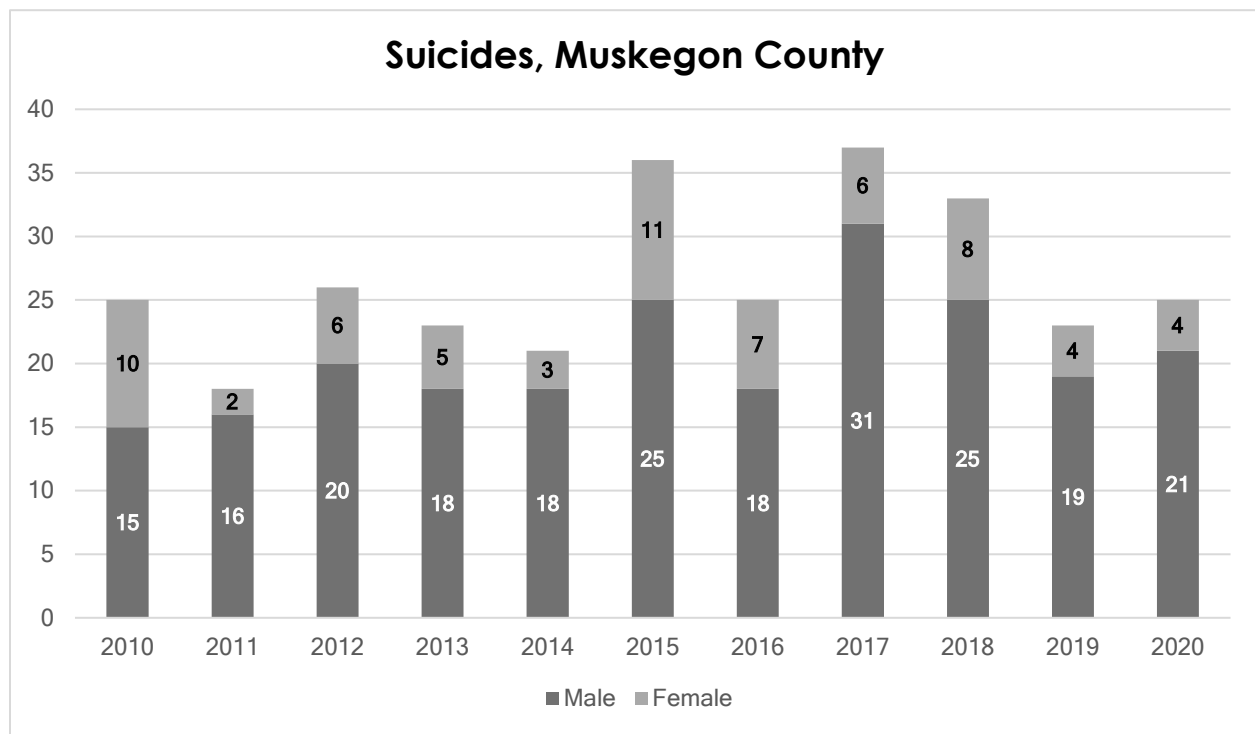
<sup>7</sup> Acute alcohol intoxications are defined as drug-related deaths and are included in this data.

## Drug-Related Deaths, Muskegon County



## Suicides by Sex & Age, Muskegon County

Year	Total	Male	Female	0 - 17	18 - 25	26 - 44	45 - 64	65 +
2010	25	15	10	0	1	9	9	6
2011	18	16	2	2	1	7	5	3
2012	26	20	6	1	2	9	8	6
2013	23	18	5	0	2	10	7	4
2014	21	18	3	3	4	3	9	2
2015	36	25	11	0	7	10	8	11
2016	25	18	7	0	2	6	11	6
2017	37	31	6	3	4	10	15	5
2018	33	25	8	0	6	12	9	6
2019	23	19	4	0	3	8	8	4
2020	25	21	4	0	3	9	6	7



### Suicides by Mechanism, Muskegon County

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Firearm	9	10	13	9	10	11	15	19	14	13	8
Hanging	5	4	7	7	7	15	5	10	9	5	9
Carbon Monoxide	2	0	0	1	0	1	1	1	0	0	1
Drug Intoxication	9	3	5	1	3	7	2	4	7	4	3
Motor Vehicle	0	0	0	2	1	2	0	0	0	0	0
Sharp Force Trauma	0	0	0	3	0	2	1	0	0	1	0
Asphyxia/Suffocation	0	1	1	0	0	0	1	1	0	0	2 <sup>1</sup>
Other	0	0	0	0	0	0	0	2	3	0	2 <sup>2</sup>
<b>Total</b>	<b>25</b>	<b>18</b>	<b>26</b>	<b>23</b>	<b>21</b>	<b>36</b>	<b>25</b>	<b>37</b>	<b>33</b>	<b>23</b>	<b>25</b>

<sup>1</sup> (1) Asphyxia due to plastic bag secured around head; (1) Asphyxia due oxygen displacement by Argon with plastic bag around head

<sup>2</sup> (1) Drowning (lake); (1) Drowning (pond) with incised wounds of wrists

## Summary of Osceola County Cases

	2018 <sup>1</sup>	2019	2020
Total Deaths in the County	187	175	211 <sup>2</sup>
Deaths Reported to the ME	62	72	78
Deaths Investigated	58	63	72
MEI Scene Investigations	55	62	66
Death Certificates by ME	31	29	32
Bodies Transported to Morgue	17	23	22
Complete Autopsy	12	12	13
Limited Autopsy	0	2	1
External Examination	4	7	8
Storage Only	1	2	0
Total Cases with Toxicology	16	20	21
Unidentified Remains After Exam	1	1	0
Referrals to Gift of Life	10	16	16
Tissue Donations	1	1	1
Cornea Donations	1	1	1
Unclaimed Investigations	0	1	2
Exhumations	0	0	0

## Cremation Permit Authorizations, Osceola County

	2018 <sup>3</sup>	2019	2020
Cremation Permits	86	128	151
% of Total Deaths with Cremation	46%	73%	72%

<sup>1</sup> Data provided in this report includes January 1 to December 31, 2018, but WMed served as ME for only April 1 to December 31, 2018.

<sup>2</sup> Provisional total number of deaths occurring in the county

<sup>3</sup> Data includes only those cremation permits reviewed and approved at WMed

## Manners of Death Reported, Osceola County

	2018	2019	2020
Natural	44	54	54
Accident	13	12	18
Suicide	3	5	4
Homicide	0	1	1
Indeterminate	1	0	0
<b>Total</b>	<b>61</b>	<b>72</b>	<b>77<sup>1</sup></b>

## Deaths Reported by Age (in years), Osceola County<sup>2</sup>

	< 1	1 - 5	6 - 10	11 - 17	18 - 25	26 - 44	45 - 64	65 +
2018	1	1	0	1	0	4	13	41
2019	0	1	1	3	0	5	20	42
2020	0	0	0	0	4	11	21	41

## Accidental Deaths by Mechanism, Osceola County

	2018	2019	2020
Vehicle	4	6	11
Drug-Related	2	3	2
Drowning	0	2	0
Fall	3	0	4
Fire	0	0	0
Environmental Exposure	0	0	1
Asphyxia	2	1	0
Other	2	0	0
<b>Total</b>	<b>13</b>	<b>12</b>	<b>18</b>

<sup>1</sup> Does not include (1) Stillbirth investigation (cremation authorization)

<sup>2</sup> All stillbirths and spontaneous abortions (miscarriages) investigated but not requiring an examination have been removed from this table for a more accurate representation of deaths reported under the age of one year.

## Drug-Related Deaths by Manner, Osceola County<sup>1</sup>

	2018	2019	2020
Accident	2	3	2
Suicide	0	0	0
Indeterminate	0	0	0
<b>Total</b>	<b>2</b>	<b>3</b>	<b>2</b>
Total involving opioid(s)	1	2	0
% of Accidents and Indeterminate Deaths Involving Opioids	50%	66%	0%

## Suicides by Sex & Age, Osceola County

Year	Total	Male	Female	0 - 17	18 - 25	26 - 44	45 - 64	65 +
2018	3	2	1	1	0	1	1	0
2019	5	5	0	0	0	1	3	1
2020	4	4	0	0	1	0	2	1

## Suicides by Mechanism, Osceola County

	2018	2019	2020
Firearm	2	4	3
Hanging	1	1	1
Carbon Monoxide	0	0	0
Drug Intoxication	0	0	0
Motor Vehicle	0	0	0
Sharp Force Trauma	0	0	0
Asphyxia/Suffocation	0	0	0
Other	0	0	0
<b>Total</b>	<b>3</b>	<b>5</b>	<b>4</b>

<sup>1</sup> Acute alcohol intoxications are defined as drug-related deaths and are included in this data.

# ST. JOSEPH COUNTY

## Summary of St. Joseph County Cases

	2017	2018	2019	2020
Total Deaths in the County	508	530	507 <sup>1</sup>	541 <sup>2</sup>
Deaths Reported to the ME	164	157	150	200
Deaths Investigated	155	150	145	196
MEI Scene Investigations	147	141	134	172
Death Certificates by ME	66	69	70	74
Bodies Transported to Morgue	56	67	61	64
Complete Autopsy	34	39	34	42
Limited Autopsy	1	2	3	4
External Examination	14	20	17	11
Storage Only	7	5	7	7
Total Cases with Toxicology	43	55	51	54
Unidentified Remains After Exam	2	0	1	0
Referrals to Gift of Life	53	45	41	71
Tissue Donations	7	6	6	4
Cornea Donations	2	3	4	1
Unclaimed Investigations	1	4	8	6
Exhumations	0	0	0	0

## Cremation Permit Authorizations, St. Joseph County

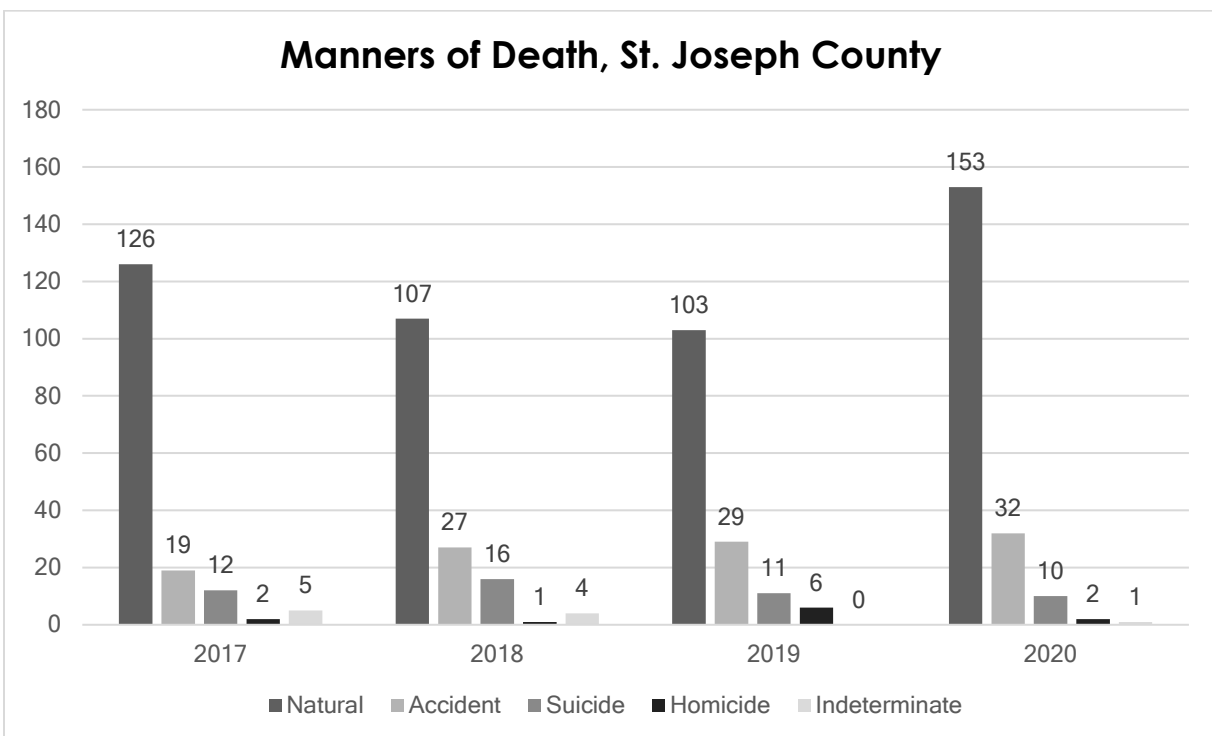
	2017	2018	2019	2020
Cremation Permits	309	306	327	386
% of Total Deaths with Cremation	61%	58%	65%	71%

<sup>1</sup> Updated total number of deaths occurring in the county

<sup>2</sup> Provisional total number of deaths occurring in the county

## Manners of Death Reported, St. Joseph County

	2017	2018	2019	2020
Natural	126	107	103	153
Accident	19	27	29	32
Suicide	12	16	11	10
Homicide	2	1	6	2
Indeterminate	5	4	0	1 <sup>1</sup>
<b>Total</b>	<b>164</b>	<b>155</b>	<b>149</b>	<b>198<sup>2</sup></b>



## Deaths Reported by Age (in years), St. Joseph County<sup>3</sup>

	< 1	1 - 5	6 - 10	11 - 17	18 - 25	26 - 44	45 - 64	65 +
2017	1	0	0	1	2	19	60	78
2018	3	2	1	3	9	17	46	70
2019	0	1	0	2	3	23	49	71
2020	2	1	0	1	6	38	66	94

<sup>1</sup> (1) Unexpected sudden death (of infant) associated with unsafe sleep and viral respiratory infection

<sup>2</sup> Does not include (2) Stillbirth investigations (cremation authorizations)

<sup>3</sup> All stillbirths and spontaneous abortions (miscarriages) investigated but not requiring an examination have been removed from this table for a more accurate representation of deaths reported under the age of one year.

## Pediatric Deaths, St. Joseph County

The four deaths of individuals under 18 years of age include:

1. <1 year old
  - a. (1) Unexpected sudden death (of infant) associated with unsafe sleep and viral respiratory infection (Coronavirus HKU1); indeterminate
  - b. (1) Positional asphyxia due to wedging associated with unsafe sleep; accident
2. 1-5 years old
  - a. (1) Sepsis due to Group A Streptococcus pyogenes associated with multiple viral respiratory co-infections; natural
3. 11-17 years old
  - a. (1) Inhalation of products of combustion, house fire; accident

## Accidental Deaths by Mechanism, St. Joseph County

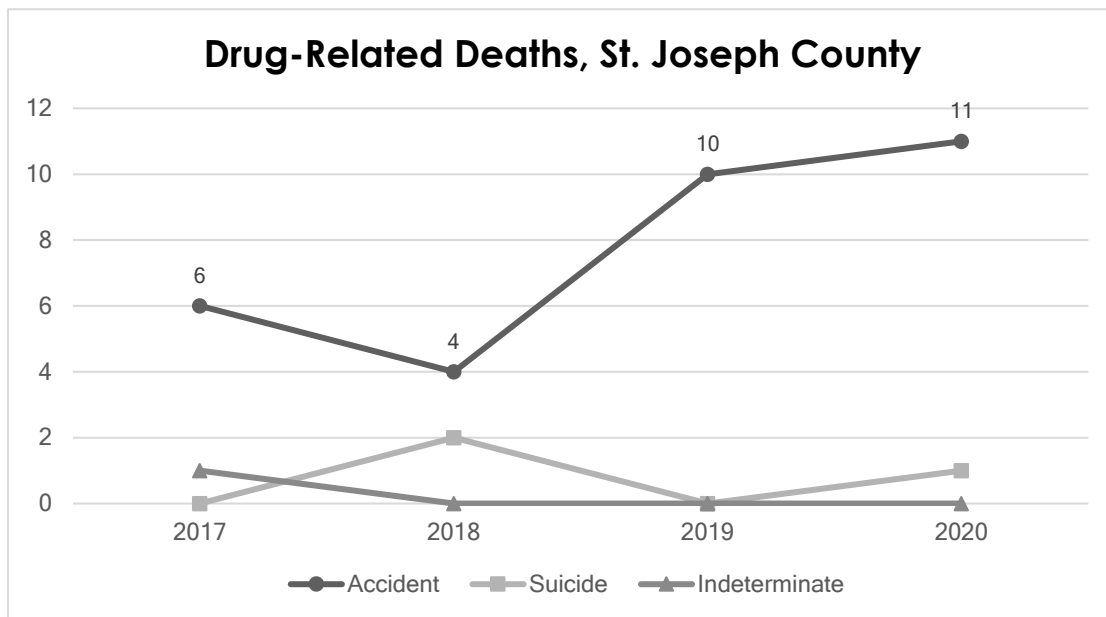
	2017	2018	2019	2020
Vehicle	8	15	11	13 <sup>1</sup>
Drug-Related	6	4	10	11
Drowning	2	1	3	2
Fall	1	3	4	3
Fire	1	4	0	2
Environmental Exposure	0	0	1	0
Asphyxia	1	1	0	1
Other	0	0	0	0
<b>Total</b>	<b>19</b>	<b>27</b>	<b>29</b>	<b>32</b>

## Drug-Related Deaths by Manner, St. Joseph County<sup>2</sup>

	2017	2018	2019	2020
Accident	6	4	10	11
Suicide	0	2	1	1
Indeterminate	1	0	0	0
<b>Total</b>	<b>7</b>	<b>6</b>	<b>11</b>	<b>12</b>
Total involving opioid(s)	6	4	4	11
% of Accidents and Indeterminate Deaths Involving Opioids	86%	75%	40%	91%

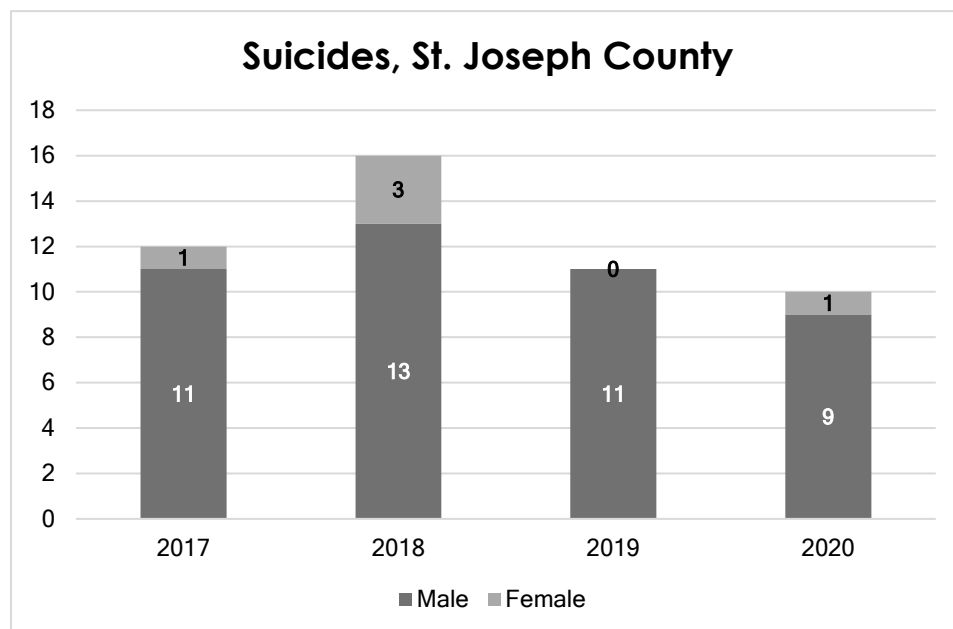
<sup>1</sup> Includes (1) Multiple blunt force injuries with acute drug intoxication

<sup>2</sup> Acute alcohol intoxications are defined as drug-related deaths and are included in this data.



## Suicides by Sex & Age, St. Joseph County

Year	Total	Male	Female	0 - 17	18 - 25	26 - 44	45 - 64	65 +
2017	12	11	1	0	1	6	3	2
2018	16	13	3	3	3	4	4	2
2019	11	11	0	1	1	5	2	2
2020	10	9	1	0	1	3	3	3



## Suicides by Mechanism, St. Joseph County

	2017	2018	2019	2020
Firearm	4	7	8	7
Hanging	5	6	1	0
Carbon Monoxide	3	0	1	0
Drug Intoxication	0	2	1	1
Motor Vehicle	0	0	0	0
Sharp Force Trauma	0	0	0	1
Asphyxia/Suffocation	0	1	0	1 <sup>1</sup>
Other	0	0	0	0
<b>Total</b>	<b>12</b>	<b>16</b>	<b>11</b>	<b>10</b>

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<sup>1</sup> (1) Self-inflicted strangulation with zip ties secured around neck

# VAN BUREN COUNTY

## Summary of Van Buren County Cases

	2018	2019	2020
Total Deaths in the County	514	496 <sup>1</sup>	603 <sup>2</sup>
Deaths Reported to the ME	162	180	220
Deaths Investigated	146	164	203
MEI Scene Investigations	142	158	188
Death Certificates by ME	61	74	89
Bodies Transported to Morgue	56	62	62
Complete Autopsy	31	40	37
Limited Autopsy	2	2	1
External Examination	20	15	17
Storage Only	3	5	6
Total Cases with Toxicology	44	53	52
Unidentified Remains After Exam	0	0	0
Referrals to Gift of Life	55	45	39
Tissue Donations	8	1	2
Cornea Donations	3	1	2
Unclaimed Investigations	2	3	4
Exhumations	1	0	0

## Cremation Permit Authorizations, Van Buren County

	2018	2019	2020
Cremation Permits	322	327	420
% of Total Deaths with Cremation	63%	67%	70%

<sup>1</sup> Updated total number of deaths occurring in the county

<sup>2</sup> Provisional total number of deaths occurring in the county

## Manners of Death Reported, Van Buren County

	2018	2019	2020
Natural	116	127	163
Accident	25	35	44
Suicide	16	9	8
Homicide	5	2	1
Indeterminate	0	6	3 <sup>1</sup>
<b>Total</b>	<b>162</b>	<b>179</b>	<b>219<sup>2</sup></b>

## Deaths Reported by Age (in years), Van Buren County<sup>3</sup>

	< 1	1 - 5	6 - 10	11 - 17	18 - 25	26 - 44	45 - 64	65 +
2018	0	2	1	0	4	13	47	95
2019	0	1	0	1	6	20	52	99
2020	0	0	1	1	7	28	55	127

## Pediatric Deaths, Van Buren County

The two deaths of individuals under 18 years of age include:

1. 6-10 years old
  - a. (1) Multiple blunt force injuries, restrained passenger in motor vehicle collision; accident
2. 11-17 years old
  - a. (1) Crushing head trauma, pedestrian pinned between utility pole and vehicle; indeterminate

<sup>1</sup> (1) Crushing head trauma due to pedestrian pinned between utility pole and vehicle; (1) Drowning (bathtub); (1) Inhalation of products of combustion and thermal injuries, house fire

<sup>2</sup> Does not include (1) Stillbirth investigation (cremation authorization)

<sup>3</sup> All stillbirths and spontaneous abortions (miscarriages) investigated but not requiring an examination have been removed from this table for a more accurate representation of deaths reported under the age of one year.

## Accidental Deaths by Mechanism, Van Buren County

	2018	2019	2020
Vehicle	8	9	11
Drug-Related	10	15	17
Drowning	1	2	4
Fall	4	5	11
Fire	0	0	0
Environmental Exposure	1	2	0
Asphyxia	1	1	1 <sup>1</sup>
Other	0	1	0
<b>Total</b>	<b>25</b>	<b>35</b>	<b>44</b>

## Drug-Related Deaths by Manner, Van Buren County<sup>2</sup>

	2018	2019	2020
Accident	10	15	17
Suicide	1	1	1
Indeterminate	0	0	0
<b>Total</b>	<b>11</b>	<b>16</b>	<b>18</b>
Total involving opioid(s)	9	12	11
% of Accidents and Indeterminate Deaths Involving Opioids	90%	80%	59%

## Suicides by Sex & Age, Van Buren County

Year	Total	Male	Female	0 - 17	18 - 25	26 - 44	45 - 64	65 +
2018	16	13	3	0	1	2	7	6
2019	9	6	3	0	0	4	1	4
2020	8	6	2	0	1	2	1	4

<sup>1</sup> (1) Multiple injuries, including traumatic asphyxia, pinned beneath tractor

<sup>2</sup> Acute alcohol intoxications are defined as drug-related deaths and are included in this data.

## Suicides by Mechanism, Van Buren County

	2018	2019	2020
Firearm	11	5	4
Hanging	3	2	2
Carbon Monoxide	0	0	1
Drug Intoxication	1	1	1
Motor Vehicle	0	0	0
Sharp Force Trauma	0	1	0
Asphyxia/Suffocation	1	0	0
Other	0	0	0
<b>Total</b>	<b>16</b>	<b>9</b>	<b>8</b>

# ADDITIONAL SERVICES & STATS

## Division of Neuropathology

The Division of Neuropathology, led by Division Chief, Dr. Amanda Fisher-Hubbard, performs a wide range of examinations, including those of forensic cases from WMed and outside institutions/medical examiner offices, private examinations for concerned families, hospital consultations, and is involved in several research projects.

	WMed Forensic Cases	Consulting Forensic Cases	Hospital Specimens	Lieber Institute	Private Neuropathological Examinations	Total
2016	43	84	11	276	4	418
2017	79	83	3	404	9	578
2018	63	99	2	492	3	659
2019	41	59	2	530	2	634
2020	53	73	2	380	3	511

## Forensic Anthropology

Forensic Anthropology services are provided to all WMed Medical Examiner counties. These services include: human versus non-human bone identification; search and recovery of remains; comparative medical and dental radiography for the positive identification of remains; complete skeletal analyses to determine biological sex, age, ancestry and stature of skeletal remains; skeletal trauma reconstructions and analyses; and input and case management of unidentified individuals in the National Missing and Unidentified Persons System (NamUs).

	Radiographic Positive Identifications	Trauma Analyses	Recoveries	Non-Human	Biological Profile
2016	46	23	2	9	2
2017	79	7	5	8	5
2018	97	15	9	16	8
2019	76	14	11	20	5
2020	83	14	10	17	6

## Hospital/Private/Consultant Postmortem Examinations

Our office provides autopsy services to Bronson Healthcare Group and Spectrum Health Lakeland, private examinations to families searching for answers, and forensic autopsies to various counties in Michigan, including the Upper Peninsula, and northern Indiana.

	Hospital	Private	Consultant Counties (Forensic)	Total
2016	10	4	257	271
2017	7	16	201	224
2018	8	9	161	178
2019	10	3	104	117
2020	9	15 <sup>1</sup>	198	222

## Referrals to organ procurement organization (Gift of Life Michigan), 2020

	Referrals to Gift of Life	Tissue Donations	Cornea Donations
Allegan	97	9	5
Barry	44	2	1
Berrien	137	8	7
Calhoun	102	11	5
Grand Traverse	49	7	2
Kalamazoo	161	17	10
Leelanau	7	1	0
Mason	19	0	0
Muskegon	137	9	4
Osceola	16	1	1
St. Joseph	71	4	1
Van Buren	39	2	2
<b>Total</b>	<b>879</b>	<b>71</b>	<b>38</b>

<sup>1</sup> Includes (2) Neuropathology only examinations

## Comparison of All Medical Examiner Counties, 2020

	Total Population <sup>1</sup>	Total Sq. Miles	Deaths in the County <sup>2</sup>	Deaths Reported	Deaths Investigated	MEI Scene Investigations	DCs by ME	Cremation Permits	% Cremated	Unclaimed Investigations
Allegan	118,081	1,833	973	291	278	250	120	650	67%	9
Barry	61,550	577	453	161	147	132	52	303	67%	4
Berrien	153,401	1,581	1,867	596	540	461	207	1,218	65%	19
Calhoun	134,159	718	1,783	585	518	450	194	1,176	66%	40
Grand Traverse	93,088	601	1,571	495	375	211	158	1,283	82%	12
Kalamazoo	265,066	580	3,444	1,242	931	746	449	2,492	72%	48
Leelanau	21,761	2,532	187	45	44	31	11	132	71%	0
Mason	29,144	1,242	344	111	97	83	34	288	84%	0
Muskegon	173,566	1,459	2,220	804	628	538	255	1,600	72%	19
Osceola	23,460	573	211	78	72	66	32	151	72%	2
St. Joseph	60,964	521	541	200	196	172	74	386	71%	6
Van Buren	75,677	1,090	603	220	203	188	89	420	70%	4
<b>2020 Total</b>	<b>1,209,917</b>	<b>13,307</b>	<b>14,197</b>	<b>4,848</b>	<b>4,029</b>	<b>3,328</b>	<b>1,675</b>	<b>10,099</b>	<b>71%</b>	<b>163</b>
2019 Total	1,209,917	13,307	12,055	3,937	3,228	2,811	1,488	8,408	70%	123

For all counties, about 34% of deaths are reported; jurisdiction is accepted, and deaths are investigated in about 27 % of the deaths in the counties. Complete autopsies are conducted in about 5% of all deaths within the county and in about 16% of deaths reported. A formal external or limited examination occurs in another 2% of deaths in the county. In total, a postmortem examination occurs in about 17% of deaths reported.

<sup>1</sup> Total county populations based on 2019 estimates by the US Census Bureau.

<sup>2</sup> Provisional number of deaths occurring in each county.

# Forensic Postmortem Examinations, 2020

	Complete Autopsies	% Complete Autopsies <sup>1</sup>	Limited Exams	External Exams	Total Postmortem Exams	% Postmortem Exams <sup>2</sup>	Cardiovascular Consults
Allegan	54	5.5%	6	23	83	8.5%	0
Barry	22	4.8%	2	7	31	6.8%	0
Berrien	103	5.5%	4	25	132	7.1%	2
Calhoun	112	6.3%	6	27	145	8.1%	0
Grand Traverse	53	3.4%	3	13	69	4.4%	0
Kalamazoo	188	5.5%	6	60	254	7.4%	1
Leelanau	1	0.05%	0	6	7	3.7%	0
Mason	12	3.5%	3	7	22	6.4%	0
Muskegon	125	5.6%	4	34	163	7.3%	0
Osceola	13	6.2%	1	8	22	10.4%	0
St. Joseph	42	7.8%	4	11	57	10.5%	0
Van Buren	37	6.1%	1	17	55	9.1%	0
Consultant Counties	197	N/A	0	1	198	N/A	0
<b>Total</b>	<b>959</b>	<b>5.4%<sup>3</sup></b>	<b>40</b>	<b>239</b>	<b>1,238</b>	<b>7.3%<sup>4</sup></b>	<b>3</b>

<sup>1</sup> Percent of all deaths in county with complete autopsies.

<sup>2</sup> Percent of all deaths in county with a postmortem examination.

<sup>3</sup> Does not include consultant county examinations.

<sup>4</sup> Does not include consultant county examinations.

# Manners of Death, All Medical Examiner Counties, 2020

	Natural	Accident	Suicide	Homicide	Indeterminate	2020 Total	2019 Total
Allegan	205	54	25	3	3	290	217
Barry	122	30	7	0	1	160	121
Berrien	470	87	21	8	6	592	430
Calhoun	437	101	18	16	9	581	506
Grand Traverse	368	100	19	2	2	491	377
Kalamazoo	895	257	47	27	12	1,238	1,058
Leelanau	37	3	5	0	0	45	33
Mason	85	17	8	0	0	110	110
Muskegon	617	138	25	14	9	803	669
Osceola	54	18	4	1	0	77	72
St. Joseph	153	32	10	2	1	198	149
Van Buren	163	44	8	1	3	219	179
<b>2020 Total</b>	<b>3,606</b>	<b>881</b>	<b>197</b>	<b>74</b>	<b>46</b>	<b>4,804</b>	---
% of 2020 Total <sup>1</sup>	74.4%	18.2%	4.1%	1.5%	0.9%	---	---
2019 Total	2,860	757	186	67	51	---	3,921

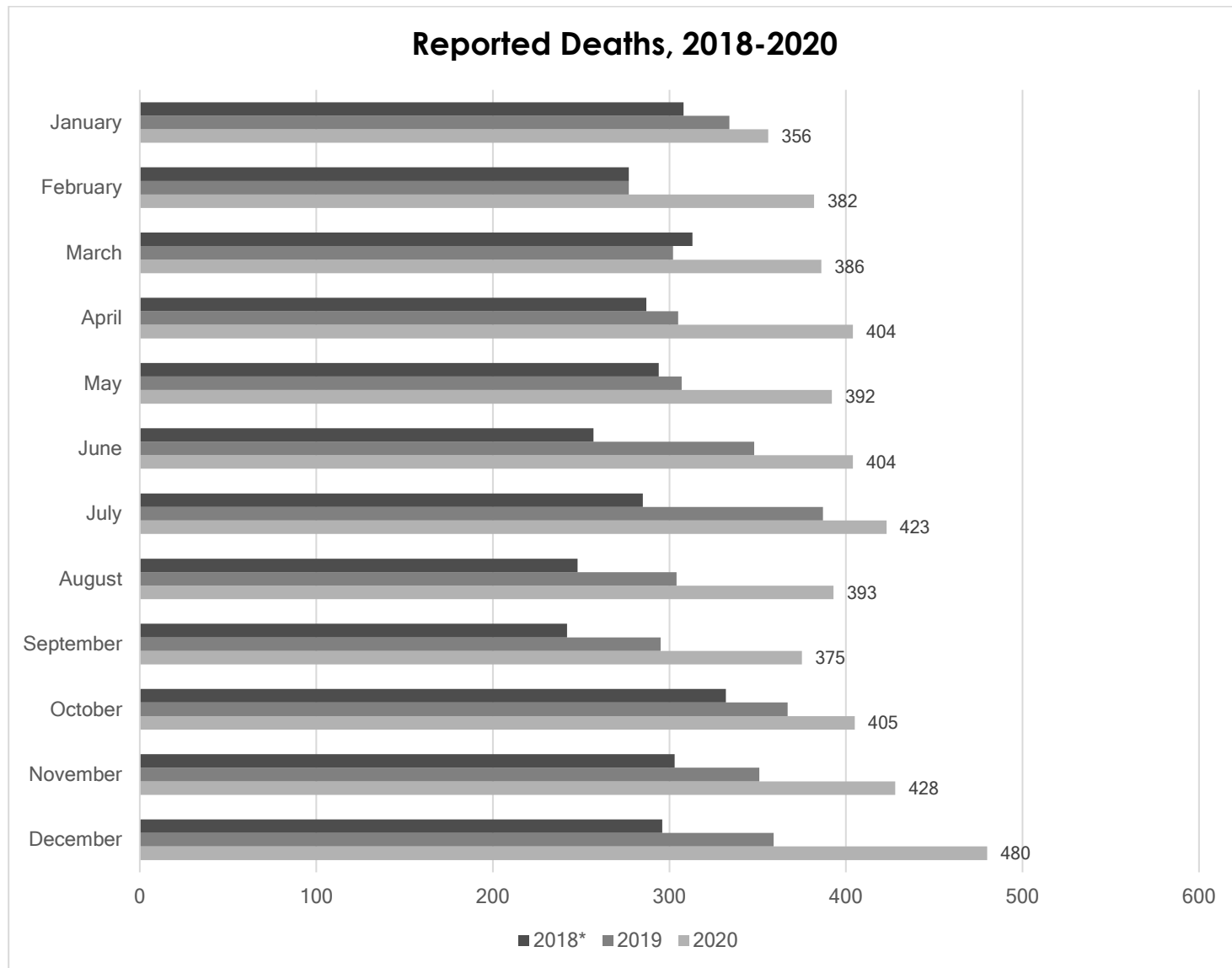
<sup>1</sup> Percent of all deaths reported to our office.

## Significant Death Statistics, 2020

	Accidental Drug-Related Deaths	Indeterminate Drug-Related Deaths	Opioid-Related Deaths	Accidental Traffic-Related Deaths	Accidental Fall-Related Deaths
Allegan	14	2	11	18	15
Barry	10	0	8	6	10
Berrien	37	0	28	15	15
Calhoun	50	2	44	20	19
Grand Traverse	19	0	15	19	47
Kalamazoo	69	1	56	40	123
Leelanau	1	0	1	1	0
Mason	5	0	5	4	4
Muskegon	57	0	50	27	38
Osceola	2	0	0	11	4
St. Joseph	11	0	11	13	3
Van Buren	17	0	11	11	11
<b>2020 Total</b>	<b>292</b>	<b>5</b>	<b>240</b>	<b>185</b>	<b>289</b>
2019 Total	218	11	177	191	226

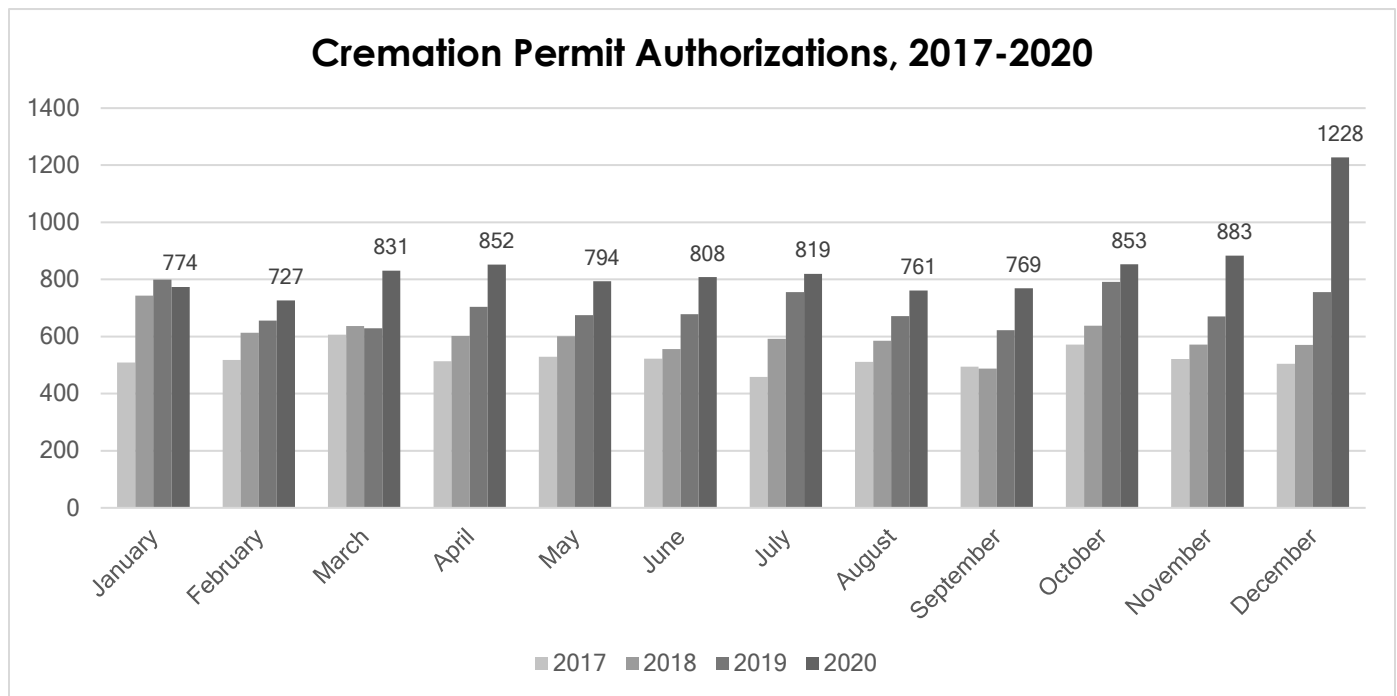
## Significant Statistics Related to COVID-19 Pandemic

Shortly after the start of the pandemic, our team recognized an increase in reported deaths with a specific increase in deaths occurring outside of a healthcare setting, thus requiring notification to our office. The number of deaths released directly from the scene to the funeral home increased from 1,511 in 2018 and 1,727 in 2019 to an extraordinary 2,265 in 2020 (31.2% increase from 2019 to 2020). The graph below shows the number of reported deaths to our office broken down by month and includes all 12 counties we serve as the Medical Examiner.



\*Does not include total number of reported deaths for Berrien County, as we were not yet the Medical Examiner's Office for the county.

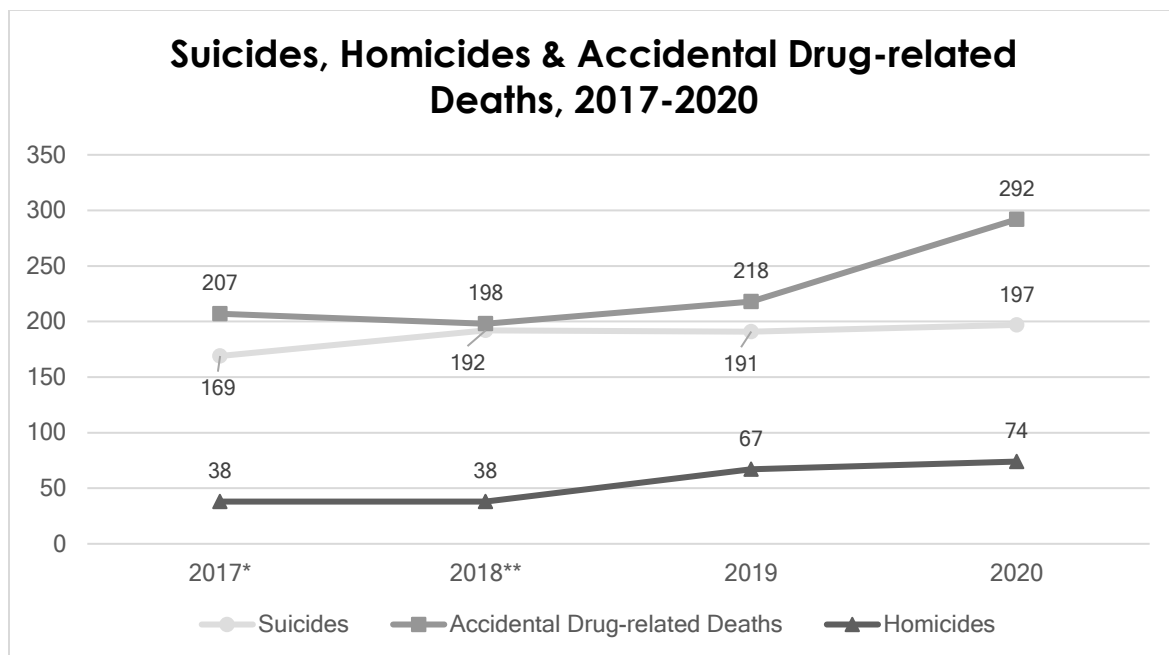
In addition to the increase in reported deaths requiring investigation, our office processed a much larger number of cremation permits than ever before. In December of 2020, nearly 25% of all cremation permits authorized by our office were for decedents whose deaths were due to COVID-19 or COVID-19 was deemed a contributory factor.



\*2017 data does not include Barry or Berrien Counties, as we were not yet the Medical Examiner.

\*\*2018 data does not include Berrien County, as we were not yet the Medical Examiner.

The number of deaths classified as homicides, suicides, and accidents increased from recent years in 2020.



\*2017 data does not include Barry or Berrien Counties, as we were not yet the Medical Examiner.

\*\*2018 data does not include Berrien County, as we were not yet the Medical Examiner.

At the start of the pandemic, testing supplies for the virus that causes COVID-19 were scarce and rationed for necessary testing. Our team tested decedents based on symptomatic status, exposure to positive cases, or based on public health risk to others (usually in the case of nursing home deaths where the decedent had been in contact with many other elderly and/or immunocompromised individuals). This later expanded as testing supplies became more readily available. The vast majority of our testing was completed through MDHHS at the Bureau of Laboratories located in Lansing, Michigan. Throughout 2020, we tested 304 decedents for SARS-CoV-2 (postmortem). Of these 304 tests, 44 (14.5%) detected SARS-CoV-2. In addition to all counties that we serve as the Medical Examiner, this includes the testing of decedents examined at the request of consultant counties. This, however, does not include testing completed on privately funded examinations.

County of Death	Decedents Tested	% of Total Deaths Reported	Negative (Not detected)	Positive (Detected)	% Positive
Allegan	14	4.8%	10	4	28.6%
Barry	3 <sup>1</sup>	1.9%	1	1	33.3%
Berrien	32	5.4%	30	2	6.3%
Calhoun	34	5.8%	26	8	23.5%
Grand Traverse	16 <sup>2</sup>	3.2%	14	1	6.3%
Kalamazoo	70 <sup>3</sup>	5.6%	61	8	11.4%
Leelanau	2	4.4%	2	0	0.0%
Mason	1 <sup>4</sup>	0.9%	0	0	0.0%
Muskegon	42 <sup>5</sup>	5.2%	33	8	19.0%
Osceola	3	3.8%	3	0	0.0%
St. Joseph	9	4.5%	7	2	22.2%
Van Buren	21	9.5%	17	4	19.0%
Consultant Counties	57 <sup>6</sup>	N/A	49	6	10.5%
<b>Total</b>	<b>304</b>	<b>5.1%</b>	<b>253</b>	<b>44</b>	<b>14.5%</b>

<sup>1</sup> (1) Test results invalid due to decompositional changes.

<sup>2</sup> (1) Specimen not tested due to labeling issue.

<sup>3</sup> (1) Test results invalid due to decompositional changes.

<sup>4</sup> (1) Test results invalid due to decompositional changes.

<sup>5</sup> (1) Test results invalid due to decompositional changes.

<sup>6</sup> (1) Test results invalid due to decompositional changes; (1) Specimen not tested due to leaking specimen at arrival to laboratory.

## Positive COVID-19 Tests (Postmortem), 2020

