



ANNUAL REPORT

2023

**Allegan
Barry
Berrien
Calhoun**

**Cass
Grand Traverse
Kalamazoo
Leelanau**

**Mason
Muskegon
St. Joseph
Van Buren**

Office of the Medical Examiner
Western Michigan University
Homer Stryker M.D. School of Medicine



WESTERN MICHIGAN UNIVERSITY

— Homer Stryker M.D. —

SCHOOL OF MEDICINE

MEDICAL EXAMINER AND FORENSIC SERVICES

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Editor's note: Every effort has been made to provide the most accurate data in this report by the Senior Manager of Research and Autopsy Operations, Abigail Grande, MPH, and the Drug Fatality and Surveillance Analyst, Gemma Harkin, MPH. If you have any questions or would like to schedule a meeting, please contact us at Pathology@wmed.edu.

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What 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 accurately determine 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 the 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, eye color, hair 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:

- Death is known or suspected to have been caused by apparent criminal violence.
- Death is unexpected and unexplained in an infant or child.
- Death is associated with police action.
- Death is apparently non-natural and in custody of a local, state, or federal institution.
- Death is due to acute workplace injury.
- Death is caused by apparent electrocution.
- 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.
- Death is caused by an unwitnessed or suspected drowning.
- Body is unidentified and the autopsy may aid in identification.
- Body is skeletonized.
- Body is charred.
- Forensic Pathologist deems a forensic autopsy is necessary to determine cause and/or manner of death, or document injuries/disease, or collect evidence.
- 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.

- **Natural** deaths are due solely or nearly totally to disease an/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 harm, fear, or death. Intent to cause death is a common element but is not required for the 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 death scenes. The MEI 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 site. 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. Jurisdiction is declined when the death does not meet the required reporting criteria per Michigan statutes.
- **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, such as 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.
- **Limited Examination:** A limited examination generally is with 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 only used in special circumstances.
- **Complete Autopsy:** A complete examination includes external and internal examination, with toxicology.

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 involve 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 and 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 in 2020 to include a Drug Fatality and Surveillance Analyst specifically to assist with tackling the evolving 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 worked with MDHHS, the Michigan Public Health Institute (MPHI), and multiple counties to progress legislation for the creation and confidentiality protections for Overdose Fatality Review Teams across the state. This bill was signed by the Governor and went into effect in early 2024.

With funding from the Council of State and Territorial Epidemiologists and the Centers for Disease Control and Prevention (CDC), our team grew to include a Public Health Project Coordinator that has been working to better assess respiratory infections in the communities we serve, specifically that of deceased individuals. This surveillance has been crucial throughout the COVID-19 pandemic and has helped to inform public health agencies across the state and the U.S. This project began in late 2020 and has been re-funded multiple times.

With continued funding from MDHHS, our office has established multiple Elder Death Review Teams throughout the counties that we serve. This team coordinates with outside agencies, including the Michigan Department of Licensing and Regulatory Affairs (LARA), to systematically review elder and vulnerable adult deaths to identify gaps in reporting, communication, and improve death investigations in this population. These teams also identify trends and opportunities for the prevention of premature death. Currently, these teams exist in eight of the counties we serve, with plans for continued expansion.

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 MDHHS and area funeral directors to have the decedent cremated. As the process results in an accumulation of unclaimed cremains, we began collaborating 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 collaboration includes an annual memorial event, which briefly paused due to the COVID-19 pandemic, but has resumed to provide a peaceful, respectful disposition of remains.

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.
- “Drug-related Deaths” specifically refer to deaths that are directly caused by an acute or mixed drug intoxication or in situations where drug intoxications directly impact or exacerbate existing medical conditions causing death.

Important Note

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 death 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.

Additionally, there are limitations to the data presented in this report. For example, the sex provided is what is reported to our office at the time of the death. At times, this is not accurate or representative of what the decedent may have identified as. Our office continues to work diligently to provide the most accurate information about and to the communities that we serve.

Summary of All Allegan County Cases

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Total Deaths in the County	705	753	745	788	772	819	974	958	987 ^[1]	865 ^[2]
Deaths Reported to the ME	193	176	203	188	197	219	291	279	279	225
Deaths Investigated	189	170	192	164	191	199	278	264	272	217
MEI Scene Investigations	177	152	174	158	185	179	250	228	240	194
Death Certificates by ME	97	77	85	76	88	88	120	208	122	107
Bodies Transported to WMed	74	66	62	69	72	69	90	80	100	95
Complete Autopsy	63	32	36	45	41	37	54	51	54	37
Limited Autopsy	2	2	5	2	2	3	6	3	3	8
External Examinations	7	18	17	13	24	21	23	19	24	38
Storage Only at WMed	2	14	4	9	5	8	7	7	19	12
Total Cases with Toxicology	70	47	52	54	59	55	79	69	75	60
Unidentified Remains After Exam	2	1	0	0	1	2	0	0	0	1 ^[3]
Referrals to Gift of Life	62	64	63	73	61	55	97	103	138	98
Tissue Donations	5	8	5	6	4	11	9	8	12	9
Cornea Donations	6	7	4	7	4	5	5	2	5	4
Unclaimed Investigations	2	3	1	2	2	8	9	10	10	11
Exhumations	0	0	0	0	0	0	0	0	0	0

Cremation Permit Authorizations

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Cremation Permits	409	404	442	469	487	519	650	644	665	618
% of Total Deaths with Cremation	58%	54%	60%	60%	63%	63%	67%	67%	67%	71%

[1] Updated total number of deaths occurring in the county

[2] Provisional total number of deaths occurring in the county

[3] (1) Partially skeletonized remains, likely portion of anatomical specimen, non-forensic

Manners of Death Reported

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Natural	132	127	149	143	141	156	205	207	203	151
Accident	39	25	36	28	35	46	54	51	52	41
Suicide	16	17	15	8	16	14	25	16	16	27
Homicide	2	5	1	2	1	0	3	2	4	3
Indeterminate	4	2	2	7	3	1	3	3	4	2 ^[1]
Total	193	176	203	188	196	217	290	279	279	224 ^[2]

Deaths Reported by Age (in years)^[3]

	<1	1-5	6-10	11-17	18-25	26-44	45-64	65+
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	0	0	0	4	7	33	99	147
2021	0	0	0	1	3	30	89	156
2022	1	0	0	0	7	28	78	165
2023	0	0	2	3	8	28	64	119

[1] (1) Found deceased at home in advanced stage of decomposition, cause and manner of death could not be determined; (1) Found deceased outdoors in advanced stage of decomposition, cause and manner of death could not be determined

[2] Does not include (1) partially skeletonized remains, likely portion of anatomical specimen

[3] 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

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

- 1. 6-10 years old
 - a. (1) Blunt force injuries, bicyclist struck by tractor; accident
 - b. (1) Shotgun wound of abdomen; homicide
- 2. 11-17 years old
 - a. (1) Multiple blunt force injuries, driver of motor vehicle that struck a tree; suicide
 - b. (1) Shotgun wound of head; suicide
 - c. (1) Multiple shotgun wounds; homicide

Accidental Deaths by Mechanism

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Vehicle	11	10	9	12	12	9	18	8	18	13
Drug-Related	20	7	11	10	9	17	14	13	15	11
Drowning	1	0	1	3	3	1	3	6	0	0
Fall	5	5	10	3	10	12	15	21	16	15
Fire	0	0	0	0	0	1	2	0	0	1
Environmental Exposure	0	2	1	0	0	1	2	0	0	0
Asphyxia	0	0	2	0	2	3	2	0	1	1 ^[1]
Other	2	1	2	0	0	2	0	1	1	0
Total	39	25	36	28	35	46	54	51	52	41

Drug-Related Deaths by Manner

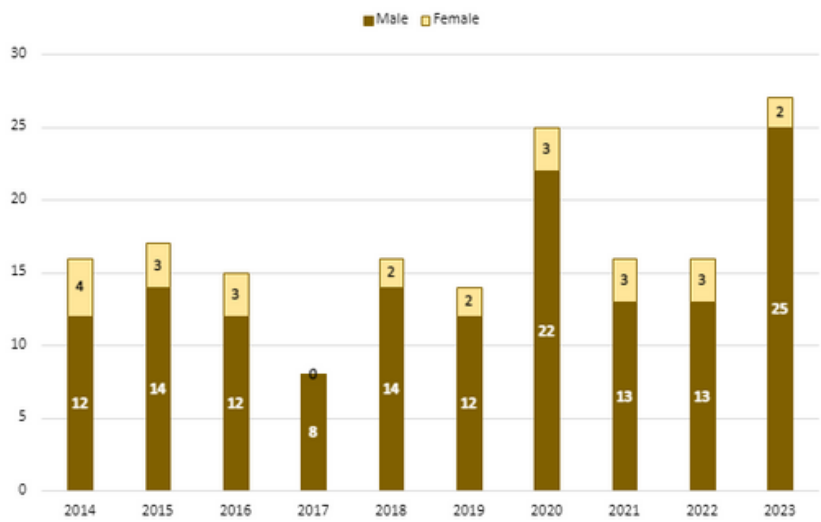
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Accident	20	7	11	10	9	17	14	13	15	9
Suicide	4	0	0	0	2	0	0	0	1	2
Indeterminate	0	0	1	2	0	0	2	0	0	0
Total	24	7	12	12	11	17	16	13	16	11
Total involving opioids(s)	N/A	6	8	6	8	13	11	9	9	6
% of Accidental and Indeterminate Deaths Involving Opioids	N/A	86%	67%	50%	78%	76%	69%	69%	60%	67%

[1] Asphyxia, trapped under commercial lawn mower

Suicides by Sex & Age

	Total	Male	Female	0-17	18-25	26-44	45-64	65+
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
2021	16	13	3	0	1	5	7	3
2022	16	13	3	0	2	6	5	3
2023	27	25	2	2	2	11	9	3

Deaths by Suicide



Suicides by Mechanism

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Firearm	11	11	10	7	8	6	15	12	8	14
Hanging	1	4	4	0	5	6	7	3	5	10
Carbon Monoxide	0	0	1	1	0	0	1	0	2	0
Drug Intoxication	4	0	0	0	1	0	0	0	1	2
Motor Vehicle	0	0	0	0	1	0	1	0	0	1
Sharp Force Trauma	0	0	0	0	0	1	0	1	0	0
Asphyxia/Suffocation	0	2	0	0	0	0	0	0	0	0
Other	0	0	0	0	1	1	1	0	0	0
Total	16	17	15	8	16	14	25	16	16	27

Summary of All Barry County Cases ^[1]

	2015	2016	2018	2019	2020	2021	2022	2023
Total Deaths in the County	416	399	390	399	453	530	442 ^[2]	440 ^[3]
Deaths Reported to the ME	125	130	146	121	161	155	135	132
Deaths Investigated	118	124	131	108	147	143	123	120
MEI Scene Investigations	112	120	128	103	132	135	116	112
Death Certificates by ME	53	57	52	54	52	53	64	57
Bodies Transported to WMed	43	47	41	38	35	41	55	42
Complete Autopsy	35	37	25	28	22	23	32	23
Limited Autopsy	1	0	1	2	2	1	1	1
External Examinations	6	8	12	8	7	13	19	15
Storage Only at WMed	1	2	3	0	4	4	3	3
Total Cases with Toxicology	N/A	N/A	35	37	28	35	44	32
Unidentified Remains After Exam	N/A	N/A	0	0	0	0	0	0
Referrals to Gift of Life	40	48	44	22	44	54	72	53
Tissue Donations ^[4]	6	17	3	3	2	6	9	2
Cornea Donations	N/A	N/A	0	1	1	4	5	3
Unclaimed Investigations	1	0	1	0	4	2	4	1
Exhumations	N/A	N/A	0	0	0	0	0	0

Cremation Permit Authorizations

	2018	2019	2020	2021	2022	2023
Cremation Permits	262	251	303	354	293	313
% of Total Deaths with Cremation	67%	63%	67%	67%	66%	71%

[1] Data from 2015-16 obtained from University of Michigan-Sparrow; data from 2017 not available at the time this report is authored

[2] Updated total number of deaths occurring in the county

[3] Provisional total number of deaths occurring in the county

[4] Cornea and tissue donations are combined for 2015-16 data

Manners of Death Reported

	2015	2016	2018	2019	2020	2021	2022	2023
Natural	93	99	113	84	122	120	87	99
Accident	18	18	21	27	30	18	36	28
Suicide	12	9	9	7	7	10	11	5
Homicide	1	2	2	2	0	4	0	0
Indeterminate	1	2	1	1	1	2	1	0
Total	125	130	146	121	160	154	135	132

Deaths Reported by Age (in years) ^[1]

	<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
2021	0	0	0	2	3	13	33	103
2022	0	0	1	2	3	17	30	82
2023	0	0	0	1	2	10	36	83

Pediatric Deaths

- The one death of individuals under 18 years of age include:
- 1. 11-17 years old
 - a. (1) Multiple blunt force injuries, passenger of buggy struck by motor vehicle; accident

[1] 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

	2018	2019	2020	2021	2022	2023
Vehicle	7	11	6	4	13	7
Drug-Related	4	5	10	4	8	9
Drowning	0	3	1	2	1	0
Fall	8	4	10	7	3	10
Fire	0	1	0	0	1	0
Environmental Exposure	0	1	0	0	3	0
Asphyxia	1	2	1	0	3	0
Other	1	0	2	1	4	2 ^[1]
Total	21	27	30	18	36	28

Drug-Related Deaths by Manner

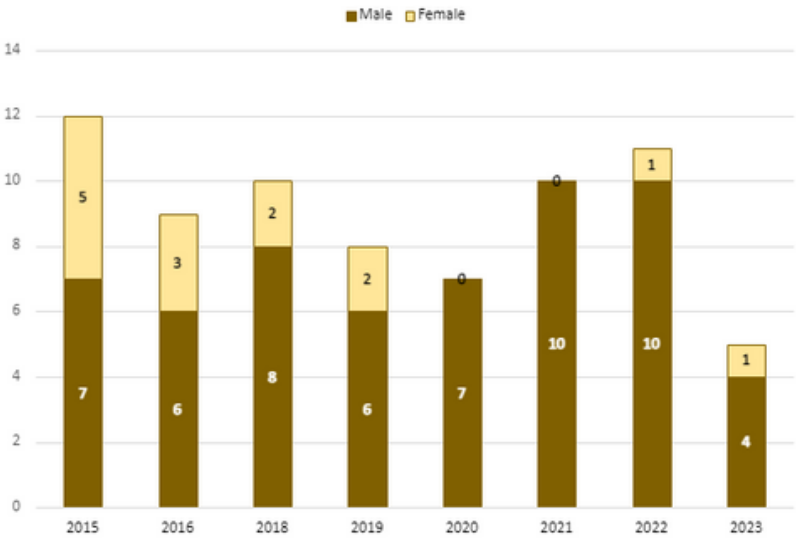
	2018	2019	2020	2021	2022	2023
Accident	4	5	10	4	8	9
Suicide	0	0	0	0	0	0
Indeterminate	1	1	0	0	0	0
Total	5	6	10	4	8	9
Total involving opioids(s)	2	4	8	4	7	7
% of Accidental and Indeterminate Deaths Involving Opioids	40%	67%	80%	100%	88%	77%

[1] (1) Multiple blunt force injuries due to being struck in head by falling object (tree/limb); (1) Multiple blunt force injuries sustained while working on construction project

Suicides by Sex & Age

	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
2021	10	10	0	1	1	1	3	4
2022	11	10	1	0	0	6	2	3
2023	5	4	1	0	2	1	2	0

Deaths by Suicide



Suicides by Mechanism

	2015	2016	2018	2019	2020	2021	2022	2023
Firearm	7	7	7	4	4	9	5	3
Hanging	3	1	1	3	2	1	3	1
Carbon Monoxide	0	0	0	0	1	0	2	1
Drug Intoxication	2	1	0	0	0	0	0	0
Motor Vehicle	0	0	0	0	0	0	0	0
Sharp Force Trauma	0	0	0	0	0	0	1	0
Asphyxia/Suffocation	0	0	0	0	0	0	0	0
Other	0	0	1	0	0	0	0	0
Total	12	9	8	7	7	10	11	5

Summary of All Berrien County Cases

	2019	2020	2021	2022	2023
Total Deaths in the County	1,622	1,873	1,916	1,899 ^[1]	1,695 ^[2]
Deaths Reported to the ME	430	596	604	631	626
Deaths Investigated	399	540	548	563	520
MEI Scene Investigations	353	461	484	498	466
Death Certificates by ME	152	207	215	271	271
Bodies Transported to WMed	132	152	159	191	202
Complete Autopsy	90	103	116	138	130
Limited Autopsy	5	4	3	5	6
External Examinations	26	25	26	32	49
Storage Only at WMed	11	20	14	16	17
Total Cases with Toxicology	110	126	134	156	165
Unidentified Remains After Exam	1	3	1	1	0
Referrals to Gift of Life	80	137	156	182	216
Tissue Donations	7	8	7	8	24
Cornea Donations	4	7	4	4	12
Unclaimed Investigations	10	19	17	18	15
Exhumations	1	0	2	0	0

Cremation Permit Authorizations

	2019	2020	2021	2022	2023
Cremation Permits	1,045	1,218	1,219	1,263	1,193
% of Total Deaths with Cremation	64%	65%	64%	67%	70%

[1] Updated total number of deaths occurring in the county
[2] Provisional total number of deaths occurring in the county

Manners of Death Reported

	2019	2020	2021	2022	2023
Natural	321	470	458	473	449
Accident	71	87	105	113	120
Suicide	21	21	10	21	29
Homicide	8	8	13	18	13
Indeterminate	9	6	12	4	14 ^[1]
Total	430	592	598	629	625 ^[2]

Deaths Reported by Age (in years)^[3]

	<1	1-5	6-10	11-17	18-25	26-44	45-64	65+
2019	6	1	1	2	6	58	108	246
2020	2	2	0	5	16	55	172	340
2021	5	0	0	4	12	60	152	367
2022	1	2	2	7	14	66	181	356
2023	9	2	1	5	10	66	165	367

[1] (1) Cardiovascular disease, found partially submerged, could not rule out a component of drowning; (1) Acute drug intoxication associated with natural disease and a recent collapse following use of conducted energy device; (1) Acute drug intoxication; (2) Mixed drug intoxication associated with significant natural disease and possible assault; (3) Thermal injuries and inhalation of products of combustion, structure fire; (4) Unexplained sudden death associated with unsafe sleep; (1) Unexplained sudden death associated with unsafe sleep and infection; (1) Found deceased at home in advanced stage of decomposition, cause and manner of death could not be determined

[2] Does not include (1) stillbirth investigation

[3] 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

The 17 deaths of individuals under 18 years of age include:

- 1. <1 year old
 - a. (4) Unexplained sudden death associated with unsafe sleep; indeterminate
 - b. (3) Extreme prematurity; natural (no postmortem exam performed)
 - c. (1) Unexplained sudden death associated with unsafe sleep and infection; indeterminate
 - d. (1) Positional asphyxia, wedged between bed and fixed object; accident
- 2. 1-5 years old
 - a. (2) Thermal injuries and inhalation of products of combustion, structure fire; indeterminate
- 3. 6-10 years old
 - a. (1) Asthma exacerbation; natural
- 4. 11-17 years old
 - a. (1) Hanging; suicide
 - b. (1) Acute drug intoxication; suicide
 - c. (1) Gunshot wound of head; suicide
 - d. (1) Gunshot wound of face; homicide
 - e. (1) Gunshot wound of arm and axilla; homicide

Infant Deaths (Live Birth to 1 Year)			
	ME-Certified with Autopsy	ME-Certified without Autopsy	Total Certified by ME
2023	6	0	6

Accidental Deaths by Mechanism

	2019	2020	2021	2022	2023
Vehicle	21	15	24	9	16
Drug-Related	23	37	36	50	50
Drowning	4	9	3	5	6
Fall	12	15	34	39	38
Fire	2	2	1	0	4
Environmental Exposure	3	4	2	4	1 ^[1]
Asphyxia	3	4	3	2	3 ^[2]
Other	3	1	2	4	2
Total	71	87	105	113	120

[1] (1) Asphyxia due to choking on food; (1) Positional asphyxia due to wedging between bed and fixed object; (1) Positional asphyxia associated with acute alcohol intoxication

[2] (1) Gunshot wound of face; (1) Multiple injuries resulting in excessive blood loss associated with significant natural disease

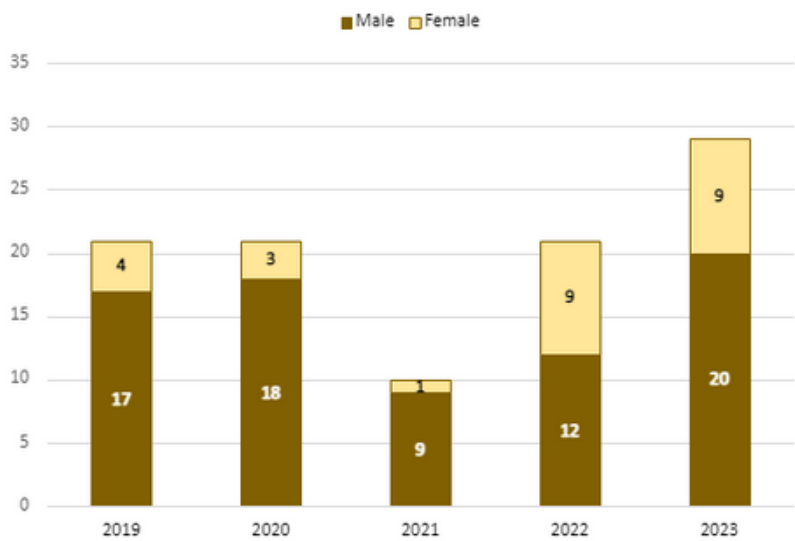
Drug-Related Deaths by Manner

	2019	2020	2021	2022	2023
Accident	23	37	36	50	50
Suicide	2	1	0	6	3
Indeterminate	1	0	1	1	4
Total	26	38	37	57	57
Total involving opioids(s)	22	29	28	46	38
% of Accidental and Indeterminate Deaths Involving Opioids	92%	78%	76%	86%	67%

Suicides by Sex & Age

	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
2021	10	9	1	1	2	3	0	4
2022	21	12	9	1	1	6	10	3
2023	29	20	9	3	5	12	6	3

Deaths by Suicide



Suicides by Mechanism

	2019	2020	2021	2022	2023
Firearm	16	14	7	7	19
Hanging	3	5	3	4	6
Carbon Monoxide	0	0	0	0	0
Drug Intoxication	2	1	0	6	3
Motor Vehicle	0	0	0	1	1
Sharp Force Trauma	0	0	0	1	0
Asphyxia/Suffocation	0	0	0	0	0
Other	0	1	0	2	0
Total	21	21	10	21	29

Summary of All Calhoun County Cases

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Total Deaths in the County	1,390	1,378	1,427	1,396	1,495	1,521	1,786	1,799	1,714 ^[1]	1,444 ^[2]
Deaths Reported to the ME	377	429	411	443	475	508	585	582	544	509
Deaths Investigated	335	392	361	400	415	442	518	534	473	459
MEI Scene Investigations	296	311	307	352	387	381	450	444	408	407
Death Certificates by ME	178	180	186	191	200	176	194	244	225	209
Bodies Transported to WMed	138	164	165	176	170	146	172	188	193	190
Complete Autopsy	103	109	103	102	103	81	112	112	121	106
Limited Autopsy	1	5	4	3	8	8	6	3	3	7
External Examinations	20	28	36	46	38	32	27	45	41	38
Storage Only at WMed	14	20	22	25	21	25	27	45	41	39
Total Cases with Toxicology	122	131	113	141	139	112	136	156	145	126
Unidentified Remains After Exam	0	0	0	0	0	0	0	0	0	1 ^[3]
Referrals to Gift of Life	119	115	118	146	107	72	102	135	186	200
Tissue Donations	8	3	11	10	11	6	11	9	13	24
Cornea Donations	8	8	11	8	9	3	5	10	9	15
Unclaimed Investigations	13	8	11	23	24	29	40	32	32	32
Exhumations	1	0	0	0	0	0	0	0	0	0

Cremation Permit Authorizations

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Cremation Permits	721	742	811	857	901	997	1,176	1,224	1,171	1,074
% of Total Deaths with Cremation	52%	54%	57%	61%	60%	66%	66%	68%	68%	74%

[1] Updated total number of deaths occurring in the county
[2] Provisional total number of deaths occurring in the county
[3] (1) Unidentified fetal remains

Manners of Death Reported

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Natural	278	313	288	313	347	383	437	443	404	375
Accident	61	80	79	86	89	88	101	112	97	84
Suicide	21	25	28	30	30	26	18	18	19	26
Homicide	5	2	5	4	6	4	16	7	9	15
Indeterminate	12	9	11	10	3	5	9	3	13	8 ^[1]
Total	377	429	411	443	475	506	581	582	542	508 ^[2]

Deaths Reported by Age (in years)^[3]

	<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
2021	3	0	0	0	10	67	173	329
2022	4	2	1	3	11	50	147	324
2023	3	1	2	1	15	55	135	296

[1] (1) Inhalation of products of combustion, structure fire; (2) Thermal injuries and inhalation of products of combustion, structure fire; (1) Unexplained sudden death associated with unsafe sleep; (1) Found deceased at home, cause and manner of death could not be determined; (1) Found deceased in bassinet, cause and manner of death could not be determined; (1) Found deceased in abandoned building in advanced stage of decomposition, cause and manner of death could not be determined; (1) Found deceased in advanced stage of decomposition, suspicious circumstances, cause and manner of death could not be determined

[2] Does not include (1) unidentified fetal remains

[3] 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

22

Pediatric Deaths

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

- 1. <1 year old
 - a. (1) Unexplained sudden death associated with unsafe sleep; indeterminate
 - b. (1) Acute hemorrhage and acute drug intoxication; homicide
 - c. (1) Found deceased in bassinet, cause and manner of death could not be determined; indeterminate
- 2. 1-5 years
 - a. (1) Multiple injuries, unrestrained passenger in motor vehicle collision; accident
- 3. 6-10 years
 - a. (1) Complications of congenital disorder; natural (no postmortem exam performed)
 - b. (1) Drowning in swimming pool; accident
- 4. 11-17 years
 - a. (1) Multiple gunshot wounds; homicide

Infant Deaths (Live Birth to 1 Year)			
	ME-Certified with Autopsy	ME-Certified without Autopsy	Total Certified by ME
2023	3	0	3

Accidental Deaths by Mechanism

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Vehicle	11	21	20	14	15	15	20	17	23	19
Drug-Related	26	44	38	44	49	40	50	59	42	37
Drowning	0	2	2	3	1	4	2	1	1	1
Fall	15	11	14	19	19	20	19	28	27	18
Fire	2	0	1	0	1	1	0	0	1	1 ^[1]
Environmental Exposure	2	0	0	0	0	3	5	2	1	2
Asphyxia	4	2	2	5	3	2	4	1	2	0
Other	1	1	2	1	1	3	1	4	0	6 ^[2]
Total	61	81	79	86	89	88	101	112	97	84

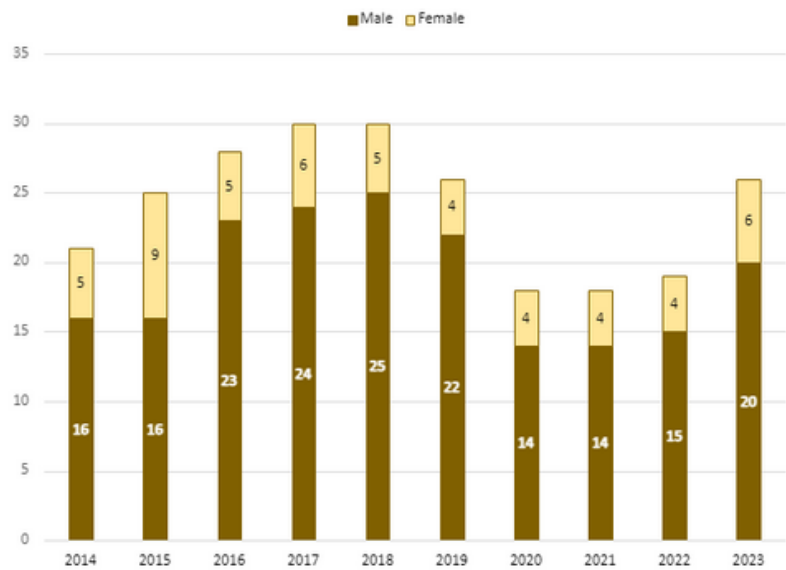
Drug-Related Deaths by Manner

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Accident	26	44	37	44	49	40	50	59	43	37
Suicide	3	2	5	3	3	3	2	1	3	3
Homicide	0	0	0	0	0	0	0	0	0	1
Indeterminate	2	2	4	5	2	0	2	0	2	0
Total	31	48	46	52	54	43	54	60	47	41
Total involving opioids(s)	N/A	42	40	48	48	36	46	49	38	30
% of Accidental and Indeterminate Deaths Involving Opioids	N/A	91%	88%	94%	92%	88%	87%	84%	74%	76%

Suicides by Sex & Age

	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	5	7
2019	26	22	4	0	4	9	9	4
2020	18	14	4	0	2	9	7	0
2021	18	14	4	0	1	6	5	6
2022	19	15	4	1	0	5	7	6
2023	26	20	6	0	5	11	3	7

Deaths by Suicide



Suicides by Mechanism

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Firearm	11	14	14	12	17	16	11	11	11	15
Hanging	7	5	6	10	10	5	4	6	5	6
Carbon Monoxide	0	0	2	0	0	0	0	0	0	2
Drug Intoxication	3	2	5	3	3	2	3	1	3	3
Motor Vehicle	0	0	1	2	0	1	1	0	0	0
Sharp Force Trauma	0	0	0	1	0	0	0	0	0	0
Asphyxia/Suffocation	0	2	0	1	0	0	0	0	0	0
Other	0	2	0	1	0	1	0	0	0	0
Total	21	25	28	30	30	26	18	18	19	26

Summary of All Cass County Cases

	2021	2022	2023
Total Deaths in the County	420	399	372
Deaths Reported to the ME	147	157 ^[1]	157 ^[2]
Deaths Investigated	143	149	150
MEI Scene Investigations	140	140	145
Death Certificates by ME	66	75	70
Bodies Transported to WMed	46	56	59
Complete Autopsy	28	39	35
Limited Autopsy	1	2	1
External Examinations	13	13	16
Storage Only at WMed	4	2	7
Total Cases with Toxicology	42	50	46
Unidentified Remains After Exam	0	0	2 ^[3]
Referrals to Gift of Life	56	66	69
Tissue Donations	4	7	12
Cornea Donations	2	2	6
Unclaimed Investigations	4	4	5
Exhumations	0	0	0

Cremation Permit Authorizations

	2021	2022	2023
Cremation Permits	262	266	285
% of Total Deaths with Cremation	63%	67%	77%

[1] Updated total number of deaths occurring in the county
[2] Provisional total number of deaths occurring in the county
[3] (2) Historical skeletal remains (one adult, one infant)

Manners of Death Reported

	2021	2022	2023
Natural	105	112	114
Accident	30	35	24
Suicide	7	7	10
Homicide	3	2	1
Indeterminate	1	1	6 ^[1]
Total	146	157	155 ^[2]

Deaths Reported by Age (in years) ^[3]

	<1	1-5	6-10	11-17	18-25	26-44	45-64	65+
2021	0	1	0	1	8	20	43	73
2022	1	0	0	2	4	24	44	82
2023	2	2	0	1	4	17	45	84

Pediatric Deaths

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

- 1. <1 year old
 - a. (2) Unexplained sudden death associated with unsafe sleep; indeterminate
- 2. 1-5 years old
 - a. (1) Drowning in lake; accident
 - b. (1) Multiple blunt force injuries, pedestrian versus trailer (hitched to motor vehicle); accident

Infant Deaths (Live Birth to 1 Year)			
	ME-Certified with Autopsy	ME-Certified without Autopsy	Total Certified by ME
2023	2	0	2

[1] Includes (2) Unexplained sudden death associated with unsafe sleep; (1) Partially skeletonized remains, cause and manner of death could not be determined; (1) Inhalation and thermal injuries sustained in residential fire of unknown etiology; (1) Complications of pelvic injury of unknown etiology; (1) Hanging
[2] Does not include (2) historical skeletal remains
[3] 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

	2021	2022	2023
Vehicle	17	13	8 ^[1]
Drug-Related	7	8	9
Drowning	0	2	1
Fall	1	6	3
Fire	3	0	1
Environmental Exposure	1	0	1
Asphyxia	0	1	1 ^[2]
Other	1	5	0
Total	30	35	24

Drug-Related Deaths by Manner

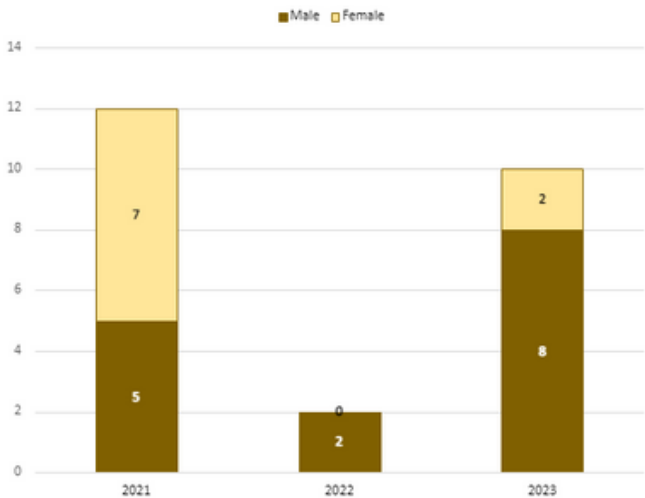
	2021	2022	2023
Accident	7	8	9
Suicide	1	0	1
Indeterminate	1	0	0
Total	9	8	10
Total involving opioids(s)	8	6	8
% of Accidental and Indeterminate Deaths Involving Opioids	88%	75%	89%

[1] Includes (1) Blunt force injuries sustained in aircraft crash
[2] Includes (1) Positional asphyxia due to seizure disorder

Suicides by Sex & Age

	Total	Male	Female	0-17	18-25	26-44	45-64	65+
2021	7	5	2	0	0	3	2	2
2022	7	7	0	1	0	2	2	3
2023	10	8	2	0	1	2	6	1

Deaths by Suicide



Suicides by Mechanism

	2021	2022	2023
Firearm	4	6	5
Hanging	1	1	1
Carbon Monoxide	0	0	0
Drug Intoxication	1	0	1
Motor Vehicle	0	0	1
Sharp Force Trauma	1	0	0
Asphyxia/Suffocation	0	0	0
Other	0	0	2 ^[1]
Total	7	7	10

[1] Includes (1) Drowning associated with acute alcohol intoxication; (1) Jump from height

Grand Traverse County

Summary of All Grand Traverse County Cases

	2017	2018	2019	2020	2021	2022	2023
Total Deaths in the County	1,306	1,413	1,345	1,575	1,782	1,669 ^[1]	1,618 ^[2]
Deaths Reported to the ME	380	350	384	495	579	532	515
Deaths Investigated	249	252	278	375	396	397	411
MEI Scene Investigations	122	206	212	211	246	247	308
Death Certificates by ME	153	126	131	158	159	179	228
Bodies Transported to WMed	77	58	65	69	80	80	114
Complete Autopsy	56	45	52	53	60	54	75
Limited Autopsy	2	0	2	3	2	6	7
External Examinations	19	13	12	13	17	20	31
Storage Only at WMed	0	0	0	0	1	0	1
Total Cases with Toxicology	73	53	61	64	75	77	93
Unidentified Remains After Exam	1	2	0	1	0	0	0
Referrals to Gift of Life	44	37	43	49	75	99	92
Tissue Donations	4	3	1	7	4	2	5
Cornea Donations	4	2	0	2	0	2	0
Unclaimed Investigations	5	7	10	12	13	9	11
Exhumations	0	0	0	0	0	0	0

Cremation Permit Authorizations

	2017	2018	2019	2020	2021	2022	2023
Cremation Permits	1,005	1,108	1,077	1,283	1,426	1,370	1,379
% of Total Deaths with Cremation	76%	78%	80%	82%	80%	82%	85%

[1] Updated total number of deaths occurring in the county
[2] Provisional total number of deaths occurring in the county

Grand Traverse County

Manners of Death Reported

	2017	2018	2019	2020	2021	2022	2023
Natural	260	260	275	368	450	394	331
Accident	93	69	75	100	98	114	152
Suicide	21	14	17	19	19	17	16
Homicide	3	1	6	2	2	0	1
Indeterminate	3	4	4	2	2	2	9 ^[1]
Total	380	348	377	491	571	528	509 ^[2]

Deaths Reported by Age (in years)^[3]

	<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	7	0	0	1	10	37	112	314
2021	0	2	0	3	6	45	115	400
2022	7	0	0	0	8	42	115	355
2023	3	1	1	1	7	52	126	318

[1] (1) Complications of blunt force injuries of unknown etiology in association with extensive natural disease; (1) Cardiovascular disease associated with deep pressure ulcer, could not rule out neglect/abuse; (1) Complications of cardiovascular disease, circumstances surrounding death unknown; (1) Multiple blunt force injuries, driver in motor vehicle collision with fixed object; (1) Unexplained sudden death associated with unsafe sleep; (1) Found unresponsive in pack and play, cause and manner could not be determined; (1) Found deceased at home in advanced stage of decomposition, cause and manner of death could not be determined; (1) Metastatic cancer associated with elevated drug levels of uncertain etiology; (1) Encephalopathy due to hypoglycemia of unknown etiology

[2] Does not include (6) stillbirth investigations

[3] 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

Grand Traverse County

Pediatric Deaths

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

- 1. <1 year old
 - a. (2) Extreme prematurity; natural (no postmortem exam performed)
 - b. (1) Unexplained sudden death associated with unsafe sleep; indeterminate
- 2. 1-5 years
 - a. Found unresponsive in pack and play, cause of death could not be determined; indeterminate
- 3. 6-10 years
 - a. Sudden cardiac death due to congenital disorder; natural
- 4. 11-17 years
 - a. Multiple blunt force injuries, helmeted dirt bike rider involved in collision with another dirt bike; accident

Infant Deaths (Live Birth to 1 Year)			
	ME-Certified with Autopsy	ME-Certified without Autopsy	Total Certified by ME
2023	1	0	1

Accidental Deaths by Mechanism

	2017	2018	2019	2020	2021	2022	2023
Vehicle	23	15	22	18	23	24	43
Drug-Related	19	9	10	19	16	22	32
Drowning	2	2	2	6	3	2	3
Fall	44	35	34	47	46	52	65
Fire	2	1	1	1	1	1	0
Environmental Exposure	0	1	0	4	2	4	1
Asphyxia	1	3	4	3	3	4	5 ^[1]
Other	2	3	2	2	4	5	3 ^[2]
Total	93	69	75	100	98	114	152

[1] (1) Asphyxia due to choking on food; (1) Positional asphyxia associated with chronic alcoholism; (1) Positional asphyxia associated with cardiovascular disease due to airway compromise with soft bedding

[2] (1) Complications of multiple injuries, crushed beneath vehicle; (1) Anaphylaxis due to wasp sting; (1) Craniocerebral trauma, struck by falling tree limb

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Grand Traverse County

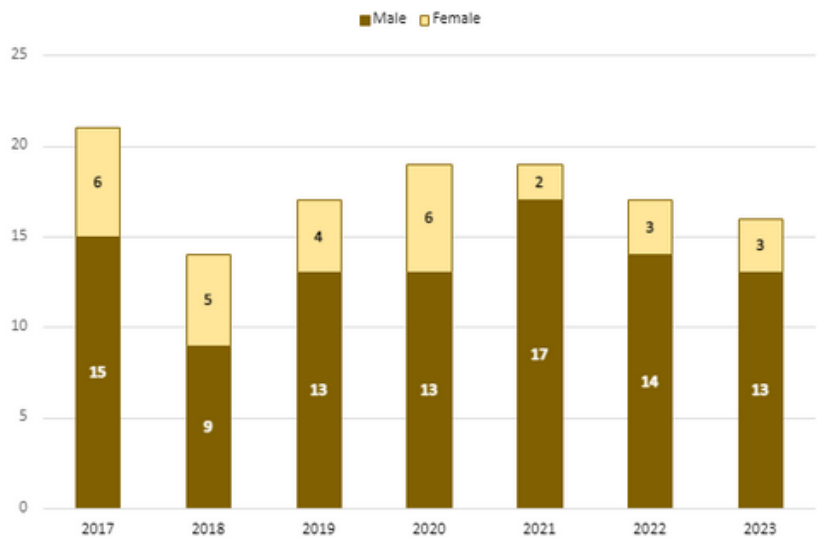
Drug-Related Deaths by Manner

	2017	2018	2019	2020	2021	2022	2023
Accident	19	9	10	19	16	22	32
Suicide	4	1	2	3	3	0	2
Indeterminate	0	0	0	0	0	0	1
Total	23	10	12	22	19	22	35
Total involving opioids(s)	18	8	8	15	16	20	22
% of Accidental and Indeterminate Deaths Involving Opioids	84%	89%	70%	68%	100%	91%	67%

Suicides by Sex & Age

	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
2021	19	17	2	2	1	5	4	7
2022	17	13	4	0	2	8	3	4
2023	16	13	3	0	1	5	6	4

Deaths by Suicide



Suicides by Mechanism

	2017	2018	2019	2020	2021	2022	2023
Firearm	11	5	9	7	7	9	6
Hanging	4	5	4	5	6	6	6
Carbon Monoxide	0	0	1	0	2	0	1
Drug Intoxication	4	1	2	3	3	0	2
Motor Vehicle	1	1	0	1	0	0	0
Sharp Force Trauma	1	1	0	3	0	1	0
Asphyxia/Suffocation	0	0	0	0	0	0	0
Other	0	1	1	0	1	1	1 ^[1]
Total	21	14	17	19	19	17	16

[1] (1) Multiple blunt force injuries due to jump from height

Kalamazoo County

Summary of All Kalamazoo County Cases

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Total Deaths in the County	2,684	2,733	2,879	2,840	2,977	2,921	3,446	3,587	3,261 ^[1]	3,250 ^[2]
Deaths Reported to the ME	750	810	975	991	1,068	1,060	1,242	1,283	1,132	1,083
Deaths Investigated	560	646	745	733	782	781	931	1,002	893	850
MEI Scene Investigations	411	434	560	627	677	650	745	821	780	751
Death Certificates by ME	355	306	390	406	405	401	449	496	499	475
Bodies Transported to WMed	253	247	318	307	330	290	302	366	347	361
Complete Autopsy	174	142	192	189	189	180	188	222	201	193
Limited Autopsy	6	7	7	4	9	7	6	5	15	14
External Examinations	37	52	60	64	68	62	60	82	82	100
Storage Only at WMed	36	46	59	50	62	41	44	55	49	54
Total Cases with Toxicology	198	174	222	238	238	224	236	292	265	261
Unidentified Remains After Exam	0	0	0	0	1	0	1	0	0	0
Referrals to Gift of Life	95	113	161	156	129	136	161	226	311	267
Tissue Donations	6	9	22	16	16	17	17	19	20	23
Cornea Donations	9	9	20	10	7	7	10	12	9	15
Unclaimed Investigations	10	10	10	13	41	40	48	51	67	39
Exhumations	0	0	1	0	0	0	0	0	0	0

Cremations Permit Authorizations

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Cremation Permits	1,782	1,672	1,856	1,920	2,101	2,028	2,492	2,594	2,436	2,458
% of Total Deaths with Cremation	66%	61%	64%	68%	71%	70%	72%	72%	75%	76%

[1] Updated total number of deaths occurring in the county
[2] Provisional total number of deaths occurring in the county

Manners of Death Reported

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Natural	530	588	680	666	750	771	895	906	795	732
Accident	158	151	222	252	238	207	257	267	239	273
Suicide	36	38	40	40	46	49	47	50	55	35
Homicide	14	14	18	14	15	19	27	35	30	28
Indeterminate	12	19	11	18	17	12	12	12	11	10 ^[1]
Total	750	810	971	990	1,066	1,058	1,238	1,270	1,130	1,078 ^[2]

Deaths Reported by Age (in years)^[3]

	<1	1-5	6-10	11-17	18-25	26-44	45-64	65+
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	256	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
2021	5	5	1	5	36	153	371	696
2022	8	4	4	8	25	130	279	672
2023	4	9	3	8	32	121	274	628

[1] Complications of dislocated hip, neglect could not be excluded; (1) Mixed drug intoxication; (1) Blunt force injuries, pedestrian versus motor vehicle;
[1] Complications of cancer and chronic alcoholism, neglect could not be excluded; (1) Found unresponsive at home, cause and manner of death could not be determined; (1) Unexplained sudden death associated with complications of spina bifida and unsafe sleep; (1) Found partially submerged in water, cause and manner of death could not be determined; (1) Found deceased outdoors in advanced stage of decomposition, cause and manner of death could not be determined; (1) Found unresponsive in vehicle, cause and manner of death could not be determined; (1) Status epilepticus, unknown etiology
[2] Does not include (3) stillbirth investigations; (2) Non-human remains
[3] 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

The 24 deaths of individuals under 18 years of age include:

- 1. <1 year old
 - a. (1) Extreme prematurity; natural (no postmortem exam performed)
 - b. (1) Mechanical asphyxia, wedged between couch and adult; homicide
 - c. (1) Pneumonia due to coronavirus KHKU1 infection; natural
 - d. (1) Unexplained sudden death associated with complications of spina bifida and unsafe sleep; indeterminate
- 2. 1-5 years
 - a. (1) Acute myeloid leukemia; natural (no postmortem exam performed)
 - b. (1) Complications of ulcerative colitis; natural (no postmortem exam performed)
 - c. (1) Asphyxia due to neck ligature, slipped in car seat securing strap around neck; accident (no postmortem exam performed)
 - d. (1) Drowning, swimming pool; accident
 - e. (1) Blunt force injuries; homicide
 - f. (1) Thermal injuries and inhalation of products of combustion, structure fire; accident
 - g. (1) Blunt head injury, restrained rear seat passenger in motor vehicle collision; accident
 - h. (1) Complications of hydranencephaly; natural
 - i. (1) Found unresponsive at home, cause and manner of death could not be determined
- 3. 6-10 years
 - a. (1) Blunt force trauma of head/neck, struck by softball; accident
 - b. (1) Thermal injuries and inhalation of products of combustion, structure fire; accident
- 4. 11-17 years
 - a. (1) Complications of traumatic asphyxia, pinned beneath vehicle; accident
 - b. (1) Complications of congenital heart disease; natural
 - c. (1) Malrotation with volvulus of small intestine; natural
 - d. (1) Multiple gunshot wounds; homicide
 - e. (1) Gunshot wound of neck; homicide
 - f. (1) Multiple blunt force injuries, passenger in motor vehicle collision with fixed objects; accident
 - g. (1) Multiple injuries, unrestrained passenger in motor vehicle collision with another vehicle; accident
 - h. (1) Blunt force injuries, pedestrian versus motor vehicle; accident

Infant Deaths (Live Birth to 1 Year)			
	ME-Certified with Autopsy	ME-Certified without Autopsy	Total Certified by ME
2023	3	0	3

Accidental Deaths by Mechanism

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Vehicle	35	46	58	72	51	45	40	74	52	62
Drug-Related	35	33	72	61	63	47	69	84	62	86
Drowning	3	1	4	7	9	5	5	0	2	4
Fall	77	57	80	92	100	85	123	86	106	102
Fire	3	3	4	5	4	5	6	4	1	6
Environmental Exposure	1	1	1	2	3	5	5	2	5	1
Asphyxia	2	7	3	6	6	12	6	7	3	9 ^[1]
Other	4	3	1	7	3	3	3	10	8	3 ^[2]
Total	160	151	223	252	238	207	257	267	239	273

Drug-Related Deaths by Manner

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Accident	35	33	72	61	63	47	69	84	62	86
Suicide	12	8	3	12	5	11	4	6	8	3
Homicide	0	0	0	1	0	0	0	0	0	0
Indeterminate	4	3	5	5	7	3	1	2	3	1
Total	51	44	80	79	75	61	74	92	73	90
Total involving opioids(s)	N/A	30	64	59	51	32	56	63	43	67
% of Accidental and Indeterminate Deaths Involving Opioids	N/A	83%	82%	74%	73%	60%	80%	69%	60%	77%

[1] (1) Positional asphyxia due to fall associated with acute alcohol intoxication; (2) Traumatic asphyxia, pinned beneath vehicle; (1) Mechanical asphyxia due to entrapment in beans within silo; (1) Asphyxia due to choking on foreign body; (2) Asphyxia due to choking on food; (1) Asphyxia due to choking on multiple foreign objects associated with acute drug intoxication; (1) Asphyxia due to neck ligature, slipped in car seat securing strap around neck

[2] (1) Electrocution; (1) Blunt force injuries of head/neck, struck by softball; (1) Complications of blunt force injuries, struck by tree limb

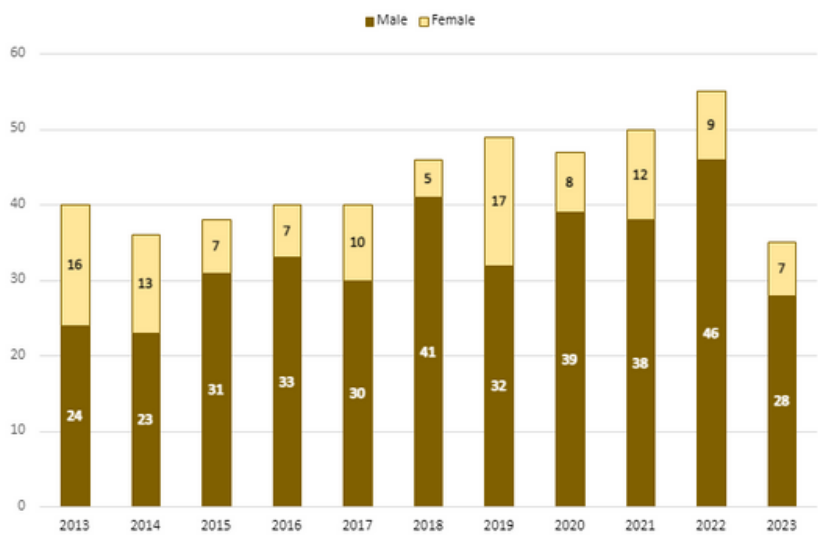
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Kalamazoo County

Suicides by Sex & Age

	Total	Male	Female	0-17	18-25	26-44	45-64	65+
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
2021	50	38	12	1	8	20	17	4
2022	55	46	9	2	5	17	21	10
2023	35	28	7	0	4	13	13	5

Death by Suicide



Suicides by Mechanism

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Firearm	14	19	19	14	26	22	21	22	30	16
Hanging	7	9	13	12	13	12	21	17	12	13
Carbon Monoxide	0	1	2	0	0	0	1	0	0	0
Drug Intoxication	12	8	3	12	5	11	4	6	8	3
Motor Vehicle	1	1	0	0	0	2	0	2	1	1
Sharp Force Trauma	0	0	2	2	0	0	0	1	2	0
Asphyxia/Suffocation	1	0	0	0	1	1	0	0	1	0
Other	1	0	1	0	1	1	0	2	1	2 ^[1]
Total	36	38	40	40	46	49	47	50	55	35

[1] (1) Inhalation of products of combustion and thermal injuries, self-immolation; (1) Multiple blunt force injuries, fall from height

Summary of All Leelanau County Cases

	2017	2018	2019	2020	2021	2022	2023
Total Deaths in the County	148	175	145	187	213	204 ^[1]	187 ^[2]
Deaths Reported to the ME	39	46	33	45	64	56	38
Deaths Investigated	36	45	33	44	60	55	38
MEI Scene Investigations	24	41	28	31	43	37	28
Death Certificates by ME	21	15	13	11	24	25	12
Bodies Transported to WMed	10	9	8	7	12	16	9
Complete Autopsy	9	7	6	1	9	11	1
Limited Autopsy	1	0	0	0	0	0	1
External Examinations	0	2	2	6	3	5	7
Storage Only at WMed	0	0	0	0	0	0	0
Total Cases with Toxicology	10	8	8	6	11	15	6
Unidentified Remains After Exam	0	0	0	0	0	0	0
Referrals to Gift of Life	6	8	6	7	14	21	13
Tissue Donations	0	1	1	1	1	2	0
Cornea Donations	0	0	0	0	0	1	0
Unclaimed Investigations	0	0	0	0	0	0	2
Exhumations	0	0	0	0	0	0	0

Cremation Permit Authorizations

	2017	2018	2019	2020	2021	2022	2023
Cremation Permits	105	130	102	132	164	141	163
% of Total Deaths with Cremation	71%	74%	70%	71%	77%	69%	87%

[1] Updated total number of deaths occurring in the county
[2] Provisional total number of deaths occurring in the county

Manners of Death Reported

	2017	2018	2019	2020	2021	2022	2023
Natural	25	36	24	37	46	42	29
Accident	8	6	6	3	13	10	4
Suicide	4	2	2	5	2	4	5
Homicide	0	0	1	0	0	0	0
Indeterminate	2	2	0	0	0	0	0
Total	39	46	33	45	61	56	38

Deaths Reported by Age (in years)

	<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
2021	0	1	0	1	1	7	11	40
2022	0	0	0	0	0	5	12	39
2023	0	0	0	0	0	2	11	25

Leelanau County

Accidental Deaths by Mechanism

	2017	2018	2019	2020	2021	2022	2023
Vehicle	2	1	3	1	1	4	0
Drug-Related	1	1	0	1	4	1	1
Drowning	0	2	2	0	1	1	2
Fall	0	1	1	0	5	2	0
Fire	0	0	0	0	0	0	0
Environmental Exposure	0	0	0	0	1	2	0
Asphyxia	0	1	0	1	0	0	1 ^[1]
Other	1	0	0	0	1	0	0
Total	4	6	6	3	13	10	4

Drug-Related Deaths by Manner

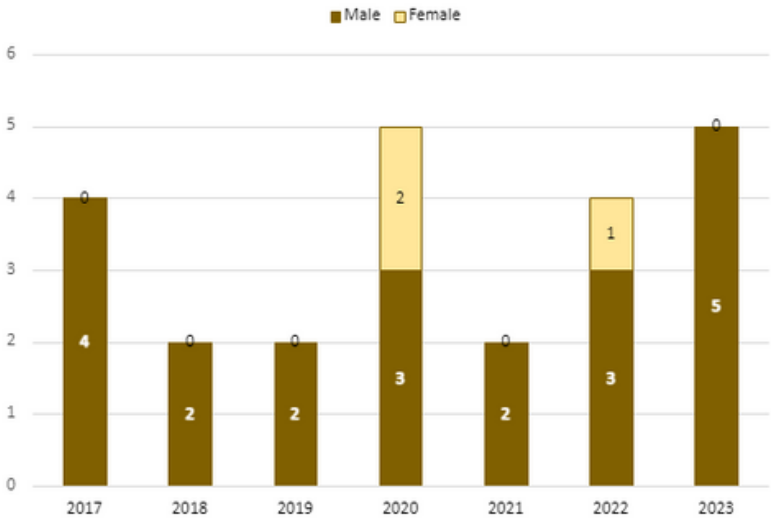
	2017	2018	2019	2020	2021	2022	2023
Accident	1	1	0	1	4	1	1
Suicide	0	0	0	0	0	1	0
Indeterminate	0	0	0	0	0	0	0
Total	1	1	0	1	4	2	1
Total involving opioids(s)	1	0	0	1	3	2	0
% of Accidental and Indeterminate Deaths Involving Opioids	100%	0%	0%	100%	75%	100%	0%

[1] Asphyxia due to choking associated with Tardive Dyskinesia

Suicides by Sex & Age

	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
2021	2	2	0	1	0	1	0	0
2022	4	3	1	0	0	1	2	1
2023	5	5	0	0	0	1	1	3

Deaths by Suicide



Suicides by Mechanism

	2017	2018	2019	2020	2021	2022	2023
Firearm	2	2	2	3	0	1	3
Hanging	1	0	0	2	2	1	2
Carbon Monoxide	0	0	0	0	0	0	0
Drug Intoxication	0	0	0	0	0	1	0
Motor Vehicle	0	0	0	0	0	0	0
Sharp Force Trauma	0	0	0	0	0	0	0
Asphyxia/Suffocation	0	0	0	0	0	0	0
Other	1	0	0	0	0	1	0
Total	4	2	2	5	2	4	5

Summary of All Mason County Cases

	2018	2019	2020	2021	2022	2023
Total Deaths in the County	311	287	344	373	345 ^[1]	308 ^[2]
Deaths Reported to the ME	107	110	111	139	115	105
Deaths Investigated	92	93	97	124	98	96
MEI Scene Investigations	88	84	83	111	88	93
Death Certificates by ME	53	52	34	44	39	46
Bodies Transported to WMed	37	34	22	32	25	35
Complete Autopsy	29	25	12	20	15	22
Limited Autopsy	0	0	3	1	0	2
External Examinations	6	7	7	7	10	11
Storage Only at WMed	2	2	0	4	0	0
Total Cases with Toxicology	32	31	21	28	22	32
Unidentified Remains After Exam	0	0	1	0	0	0
Referrals to Gift of Life	16	10	19	26	26	50
Tissue Donations	3	2	0	2	2	3
Cornea Donations	0	1	0	1	1	1
Unclaimed Investigations	1	0	0	6	1	0
Exhumations	0	0	0	0	0	0

Cremation Permit Authorizations

	2018	2019	2020	2021	2022	2023
Cremation Permits	231	224	288	300	255	264
% of Total Deaths with Cremation	74%	78%	84%	80%	74%	86%

[1] Updated total number of deaths occurring in the county
[2] Provisional total number of deaths occurring in the county

Manners of Death Reported

	2018	2019	2020	2021	2022	2023
Natural	84	82	85	109	95	77
Accident	16	24	17	19	15	16
Suicide	7	2	8	8	2	10
Homicide	0	1	0	0	1	1
Indeterminate	0	1	0	1	0	0
Total	107	110	110	137	113	104 ^[1]

Deaths Reported by Age (in years)^[2]

	<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	0	0	0	0	1	10	28	71
2021	0	0	0	1	2	15	31	88
2022	0	0	0	0	0	12	23	78
2023	1	0	0	0	2	12	26	63

Pediatric Deaths

The one death of individuals under 18 years of age include:

1. <1 year old
- a. (1) Extreme prematurity; natural (no postmortem exam performed)

Infant Deaths (Live Birth to 1 Year)			
	ME-Certified with Autopsy	ME-Certified without Autopsy	Total Certified by ME
2023	0	0	0

[1] Does not include (1) stillbirth or spontaneous abortion (miscarriage) investigation

[2] 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

	2018	2019	2020	2021	2022	2023
Vehicle	5	6	4	5	8	3
Drug-Related	7	2	5	7	6	6
Drowning	1	7	2	2	0	1
Fall	3	6	4	4	1	2
Fire	0	0	0	0	0	0
Environmental Exposure	0	3	0	0	0	0
Asphyxia	0	0	1	1	0	0
Other	0	0	1	0	0	4 ^[1]
Total	16	24	17	19	15	16

Drug-Related Deaths by Manner

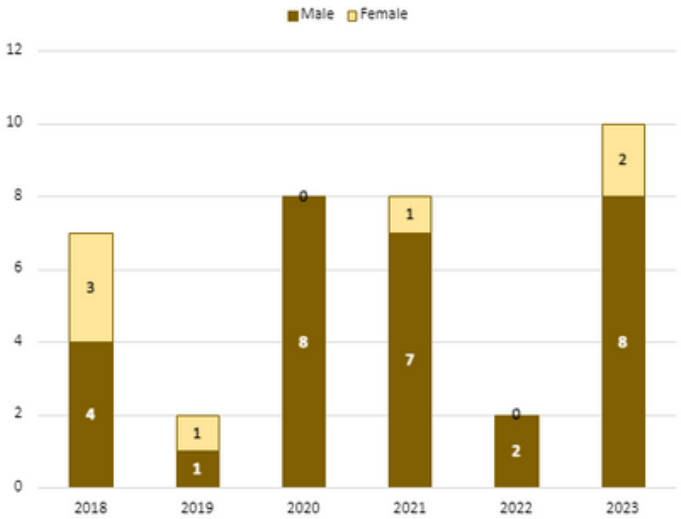
	2018	2019	2020	2021	2022	2023
Accident	7	2	5	7	6	6
Suicide	1	0	0	1	0	2
Indeterminate	0	1	0	0	0	0
Total	8	3	5	8	6	8
Total involving opioids(s)	4	1	5	7	4	7
% of Accidental and Indeterminate Deaths Involving Opioids	57%	33%	100%	100%	67%	100%

[1] (2) Multiple injuries, single-engine plane crash; (1) Bowel obstruction due to fruit pit impaction; (1) Carbon monoxide poisoning

Suicides by Sex & Age

	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
2021	8	7	1	1	0	3	4	0
2022	2	2	0	0	0	2	0	0
2023	10	8	2	0	2	3	2	3

Deaths by Suicide



Suicides by Mechanism

	2018	2019	2020	2021	2022	2023
Firearm	2	2	6	4	0	4
Hanging	4	0	2	2	2	4
Carbon Monoxide	0	0	0	0	0	0
Drug Intoxication	1	0	0	1	0	2
Motor Vehicle	0	0	0	0	0	0
Sharp Force Trauma	0	0	0	1	0	0
Asphyxia/Suffocation	0	0	0	0	0	0
Other	0	0	0	0	0	0
Total	7	2	8	8	2	10

Muskegon County

Summary of All Muskegon County Cases

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Total Deaths in the County	1,707	1,784	1,479	1,784	1,841	1,846	2,222	2,176	2,078 ^[1]	1,988 ^[2]
Deaths Reported to the ME	524	605	585	629	662	670	804	842	786	724
Deaths Investigated	453	530	504	468	504	523	628	642	620	549
MEI Scene Investigations	444	501	469	425	463	467	538	537	532	503
Death Certificates by ME	228	251	231	234	235	248	255	292	317	310
Bodies Transported to WMed	178	159	167	159	161	177	167	191	222	225
Complete Autopsy	144	120	114	108	117	134	125	137	162	147
Limited Autopsy	2	4	2	4	4	5	4	4	11	8
External Examinations	18	35	41	43	35	30	34	39	45	51
Storage Only at WMed	4	0	10	4	4	8	4	11	4	19
Total Cases with Toxicology	152	160	136	140	147	160	158	179	213	186
Unidentified Remains After Exam	0	0	0	0	0	0	0	1	0	0
Referrals to Gift of Life	156	139	109	122	128	104	137	155	176	182
Tissue Donations	14	17	12	9	15	12	9	12	15	9
Cornea Donations	16	20	11	7	8	6	4	8	1	4
Unclaimed Investigations	6	5	7	12	15	14	19	20	21	21
Exhumations	0	0	0	0	0	0	0	2	0	0

Cremation Permit Authorizations

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Cremation Permits	1,007	1,116	1,138	1,188	1,264	1,383	1,600	1,637	1,582	1,561
% of Total Deaths with Cremation	59%	63%	65%	67%	68%	75%	72%	75%	76%	79%

[1] Updated total number of deaths occurring in the county
[2] Provisional total number of deaths occurring in the county

Manners of Death Reported

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Natural	377	440	429	456	500	480	617	628	565	504
Accident	102	103	107	116	107	137	138	158	150	157
Suicide	21	36	25	37	33	23	25	31	46	39
Homicide	14	10	11	12	16	17	14	13	19	13
Indeterminate	10	15	13	8	6	12	9	9	5	10 ^[1]
Total	524	604	585	629	662	669	803	839	785	723 ^[2]

Deaths Reported by Age (in years)^[3]

	<1	1-5	6-10	11-17	18-25	26-44	45-64	65+
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	89	199	488
2021	5	0	0	1	20	92	236	485
2022	4	1	0	4	20	98	203	455
2023	4	1	1	5	12	89	193	418

[1] (3) Acute drug intoxication; (1) Thermal injuries and inhalation of products of combustion, structure fire; (1) Multiple blunt force injuries, motor vehicle collision; (1) Status epilepticus of unknown etiology; (1) Unexplained sudden death associated with unsafe sleep; (1) Unexplained sudden death possibly associated with hypertension and neurofibromatosis mutation; (1) Death in hospital, cause and manner could not be determined; (1) Multisystem failure of uncertain etiology

[2] Does not include (1) fetal remains

[3] 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

52

Pediatric Deaths

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

- 1. <1 year old
 - a. (1) Unexplained sudden death associated with unsafe sleep; indeterminate
 - b. (1) Complications of renal hypoplasia; natural (no postmortem exam performed)
 - c. (1) Unexplained sudden death possibly associated with hypertension and neurofibromatosis mutation; indeterminate
 - d. (1) Gunshot wound of head; homicide
- 2. 1-5 years
 - a. (1) Acute drug intoxication; indeterminate
- 3. 6-10 years
 - a. (1) Multiple gunshot wounds of head; homicide
- 4. 11-17 years
 - a. (2) Hanging; suicide
 - b. (1) Complications of calf muscle injury sustained during athletic activity, complicated by genetic mutation; accident
 - c. (1) Acute drug intoxication; accident
 - d. (1) Gunshot wound of chest; homicide

Infant Deaths (Live Birth to 1 Year)			
	ME-Certified with Autopsy	ME-Certified without Autopsy	Total Certified by ME
2023	3	0	3

Accidental Deaths by Mechanism

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Vehicle	18	22	22	22	21	33	27	28	21	24
Drug-Related	47	39	40	47	40	46	57	59	71	75
Drowning	4	4	2	4	2	5	4	6	5	1
Fall	29	29	32	38	37	43	38	51	42	40
Fire	1	3	1	0	0	1	3	1	1	0
Environmental Exposure	1	1	4	0	1	2	4	7	4	5
Asphyxia	2	3	4	2	5	4	4	3	2	6
Other	1	2	2	3	2	3	1	3	4	5 ^[1]
Total	103	103	107	116	107	137	138	158	150	157

[1] (1) Carbon monoxide poisoning; (1) Gunshot wound of chest; (1) Multiple injuries, crushed by crane; (1) Multiple blunt force injuries, struck by tree limb; (1) Complications of calf muscle injury sustained during athletic activity

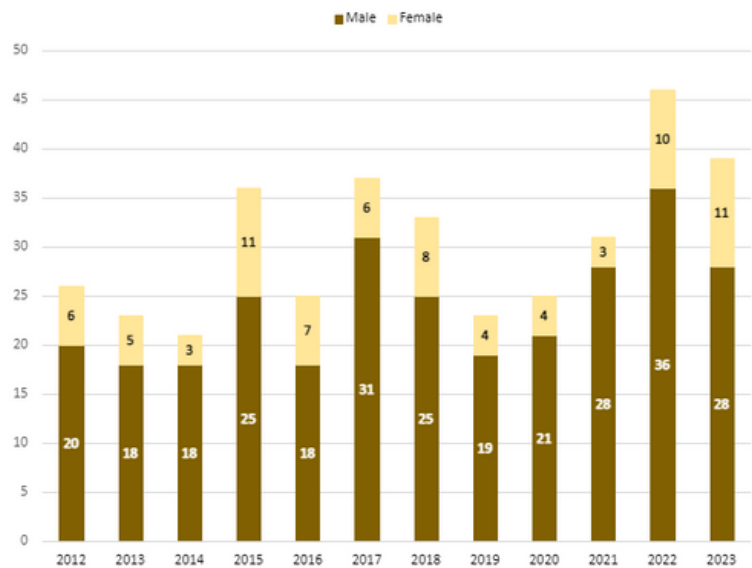
Drug-Related Deaths by Manner

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Accident	47	39	39	47	40	46	57	59	71	75
Suicide	2	7	3	4	10	4	3	5	6	8
Indeterminate	5	4	6	3	1	5	0	0	1	3
Total	54	50	48	54	51	55	60	64	78	86
Total involving opioids(s)	N/A	43	41	43	39	43	50	54	64	67
% of Accidental and Indeterminate Deaths Involving Opioids	N/A	95%	87%	84%	85%	84%	88%	88%	83%	87%

Suicides by Sex & Age

	Total	Male	Female	0-17	18-25	26-44	45-64	65+
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
2021	31	28	3	0	3	12	10	6
2022	46	36	10	1	7	20	12	6
2023	39	28	11	2	6	12	10	9

Deaths by Suicide



Suicides by Mechanism

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Firearm	10	11	15	19	14	13	8	10	23	20
Hanging	7	15	5	10	9	5	9	9	13	8
Carbon Monoxide	0	1	1	1	0	0	1	2	2	0
Drug Intoxication	3	7	2	4	7	4	3	05	6	8 ^[1]
Motor Vehicle	1	0	0	0	0	0	0	0	1	0
Sharp Force Trauma	0	2	1	0	0	1	0	1	0	1
Asphyxia/Suffocation	0	0	1	1	0	0	2	1	1	0
Other	0	0	0	2	3	0	2	3	0	2 ^[2]
Total	21	36	25	37	33	23	25	31	46	39

[1] Includes (1) chemical ingestion (Lysol)
[2] (1) Drowning in river; (1) Multiple blunt force injuries due to fall from height

Summary of All St. Joseph County Cases

	2017	2018	2019	2020	2021	2022	2023
Total Deaths in the County	508	530	507	541	604	562 ^[1]	508 ^[2]
Deaths Reported to the ME	164	157	150	200	220	198	171
Deaths Investigated	155	150	145	196	191	184	165
MEI Scene Investigations	147	141	134	172	173	161	152
Death Certificates by ME	66	69	70	74	73	80	76
Bodies Transported to WMed	56	67	61	64	54	64	57
Complete Autopsy	34	39	34	42	30	39	28
Limited Autopsy	1	2	3	4	1	4	4
External Examinations	14	20	17	11	16	11	21
Storage Only at WMed	7	5	7	7	7	10	4
Total Cases with Toxicology	43	55	1	54	45	50	49
Unidentified Remains After Exam	2	0	1	0	0	0	0
Referrals to Gift of Life	53	45	41	71	70	102	69
Tissue Donations	7	6	6	4	7	5	5
Cornea Donations	2	3	4	1	5	5	4
Unclaimed Investigations	1	4	8	6	4	6	6
Exhumations	0	0	0	0	0	0	0

Cremation Permit Authorizations

	2017	2018	2019	2020	2021	2022	2023
Cremation Permits	309	306	327	386	424	408	370
% of Total Deaths with Cremation	61%	58%	65%	71%	71%	73%	73%

[1] Updated total number of deaths occurring in the county
[2] Provisional total number of deaths occurring in the county

Manners of Death Reported

	2017	2018	2019	2020	2021	2022	2023
Natural	126	107	103	153	181	148	124
Accident	19	27	29	32	23	37	28
Suicide	12	16	11	10	12	9	15
Homicide	2	1	6	2	1	0	1
Indeterminate	5	4	0	1	3	4	2 ^[1]
Total	164	155	149	198	220	198	170 ^[2]

Deaths Reported by Age (in years)^[3]

	<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
2021	1	0	0	1	3	18	71	126
2022	2	2	0	2	5	15	58	114
2023	1	0	0	3	7	20	46	93

Pediatric Deaths

The one death of individuals under 18 years of age include:

1. <1 year old
- a. (1) Unexplained sudden death associated with unsafe sleep; indeterminate

Infant Deaths (Live Birth to 1 Year)			
	ME-Certified with Autopsy	ME-Certified without Autopsy	Total Certified by ME
2023	1	0	1

[1] (1) Hanging, circumstances unclear; (1) Unexplained sudden death associated with unsafe sleep

[2] Does not include (1) stillbirth investigation

[3] 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

	2017	2018	2019	2020	2021	2022	2023
Vehicle	8	15	11	13	6	10	10
Drug-Related	6	4	10	11	6	11	8
Drowning	2	1	3	2	3	3	1
Fall	1	3	4	3	5	7	5
Fire	1	4	0	2	0	4	3
Environmental Exposure	0	0	1	0	0	1	0
Asphyxia	1	1	0	1	1	0	0
Other	0	0	0	0	2	1	1 ^[1]
Total	19	27	29	32	23	37	28

Drug-Related Deaths by Manner

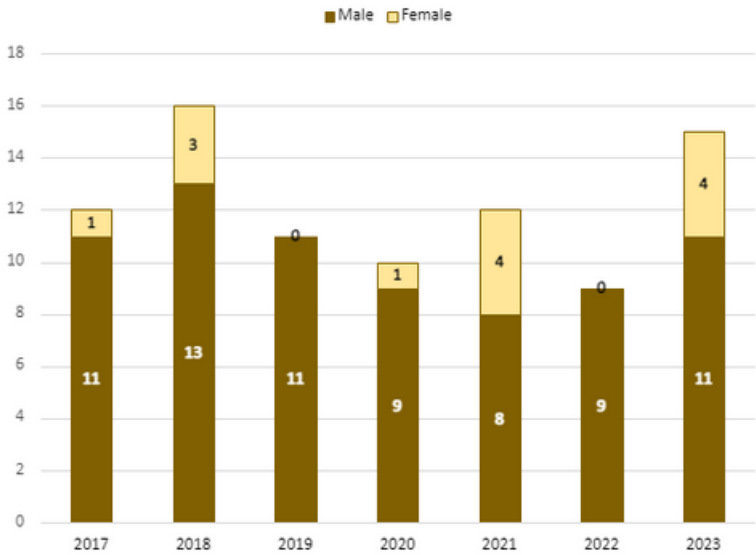
	2017	2018	2019	2020	2021	2022	2023
Accident	6	4	10	11	6	11	8
Suicide	0	2	1	1	2	1	1
Indeterminate	1	0	0	0	2	0	0
Total	7	6	11	12	10	12	9
Total involving opioids(s)	6	4	4	11	7	5	6
% of Accidental and Indeterminate Deaths Involving Opioids	86%	75%	40%	91%	88%	45%	75%

[1] (1) Anaphylaxis due to insect sting

Suicides by Sex & Age

	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
2021	12	8	4	1	1	4	5	1
2022	9	9	0	0	2	0	3	4
2023	15	11	4	1	1	6	4	3

Deaths by Suicide



Suicides by Mechanism

	2017	2018	2019	2020	2021	2022	2023
Firearm	4	7	8	7	2	7	7
Hanging	5	6	1	0	6	1	6
Carbon Monoxide	3	0	1	0	0	0	0
Drug Intoxication	0	2	1	1	2	1	1
Motor Vehicle	0	0	0	0	0	0	1
Sharp Force Trauma	0	0	0	1	1	0	0
Asphyxia/Suffocation	0	1	0	1	1	0	0
Other	0	0	0	0	0	0	0
Total	12	16	11	10	12	9	15

Summary of All Van Buren County Cases

	2018	2019	2020	2021	2022	2023
Total Deaths in the County	514	496	605	612	606 ^[1]	543 ^[2]
Deaths Reported to the ME	162	180	220	241	250	206
Deaths Investigated	146	164	203	229	238	202
MEI Scene Investigations	142	158	188	217	229	195
Death Certificates by ME	61	74	89	96	95	81
Bodies Transported to WMed	56	62	62	86	82	71
Complete Autopsy	31	40	37	54	48	39
Limited Autopsy	2	2	1	0	1	2
External Examinations	20	15	17	18	22	21
Storage Only at WMed	3	5	6	14	11	9
Total Cases with Toxicology	44	53	52	69	63	55
Unidentified Remains After Exam	0	0	0	1	0	0
Referrals to Gift of Life	55	45	39	95	109	113
Tissue Donations	8	1	2	7	7	9
Cornea Donations	3	1	2	1	4	6
Unclaimed Investigations	2	3	4	9	11	8
Exhumations	1	0	0	0	0	0

Cremation Permit Authorizations

	2018	2019	2020	2021	2022	2023
Cremation Permits	322	327	420	439	440	384
% of Total Deaths with Cremation	63%	67%	70%	72%	73%	71%

[1] Updated total number of deaths occurring in the county
[2] Provisional total number of deaths occurring in the county

Manners of Death Reported

	2018	2019	2020	2021	2022	2023
Natural	116	127	163	176	200	151
Accident	25	35	44	45	39	33
Suicide	16	9	8	6	6	16
Homicide	5	2	1	7	0	3
Indeterminate	0	6	3	4	5	3 ^[1]
Total	162	179	219	238	250	206

Deaths Reported by Age (in years) ^[2]

	<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
2021	0	0	0	0	3	30	83	122
2022	3	0	1	0	6	22	70	148
2023	0	0	0	3	8	16	63	116

Pediatric Deaths

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

- 1. 11-17 years
 - a. (2) Gunshot wound of head; suicide
 - b. (1) Intraoral shotgun wound; suicide

[1] (3) Inhalation of products of combustion, structure fire
[2] 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

	2018	2019	2020	2021	2022	2023
Vehicle	8	9	11	14	11	3
Drug-Related	10	15	17	19	13	14
Drowning	1	2	4	2	5	1
Fall	4	5	11	7	9	8
Fire	0	0	0	1	1	0
Environmental Exposure	1	2	0	1	0	0
Asphyxia	1	1	1	1	0	0
Other	0	1	0	0	0	2 ^[1]
Total	25	35	44	45	39	33

Drug-Related Deaths by Manner

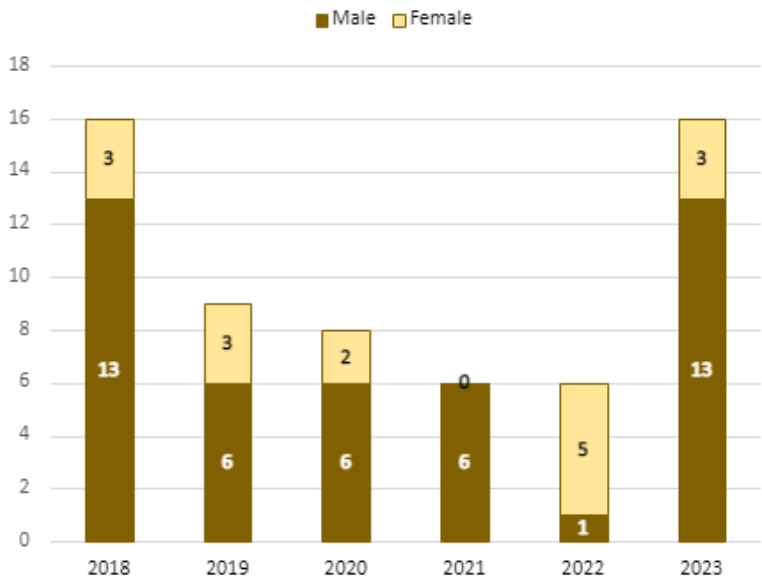
	2018	2019	2020	2021	2022	2023
Accident	10	15	17	19	13	14
Suicide	1	1	1	1	3	0
Indeterminate	0	0	0	1	0	0
Homicide	0	0	0	1	0	0
Total	11	16	18	22	16	14
Total involving opioids(s)	9	12	11	14	10	9
% of Accidental and Indeterminate Deaths Involving Opioids	90%	80%	59%	70%	69%	64%

[1] (1) Anaphylaxis due to insect sting; (1) Carbon monoxide poisoning

Suicides by Sex & Age

	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
2021	6	6	0	0	1	1	4	0
2022	6	1	5	0	0	1	3	2
2023	16	13	3	3	1	5	3	4

Deaths by Suicide



Suicides by Mechanism

	2018	2019	2020	2021	2022	2023
Firearm	11	5	4	2	1	14
Hanging	3	2	2	3	1	2
Carbon Monoxide	0	0	1	0	0	0
Drug Intoxication	1	1	1	1	3	0
Motor Vehicle	0	0	0	0	0	0
Sharp Force Trauma	0	1	0	0	0	0
Asphyxia/Suffocation	1	0	0	0	0	0
Other	0	0	0	0	1	0
Total	16	9	8	6	6	16

Additional Services & Statistics

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 inquiring families, hospital consultations, and is involved in several research projects. Since 2016, the Division of Neuropathology at WMed has partnered with the Lieber Institute for Brain Development located in Baltimore, Maryland.

	WMed Forensic Cases	Consulting Forensic Cases	Hospital Specimens	Research Specimens	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
2021	57	99	1	460	2	619
2022	51	91	0	697	3	842
2023	29	108	0	607	1	745

Additional Services & Statistics

Forensic Anthropology

Forensic Anthropology services are provided to all WMed Medical Examiner counties led by board-certified forensic anthropologists, Drs. Jered Cornelison and Christine Pink. 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, including trauma reconstruction and analysis and determination of biological sex, age, ancestry, stature; and input and case management of unidentified individuals in the National Missing and Unidentified Persons System (NamUs). The team of forensic anthropologists at WMed also assists in the coordination of all scientific identification via multiple corresponding factors. In 2022, our team grew with the addition of a two-year post-doctoral fellowship program, which was filled by Dr. Jessica Juarez.

	Comparative Medical Radiography	Comparative Dental Radiography	Fingerprint Analysis	Multiple Corresponding Factors	DNA Analysis	Recoveries	Non-Human	Skeletal Analysis
2016	38	12	24	2	0	2	6	14
2017	65	16	29	2	4	11	8	11
2018	55	27	48	5	4	9	17	18
2019	60	18	49	3	4	8	20	14
2020	83	10	52	5	4	7	17	15
2021	116	9	42	4	5	13	7	22
2022	135	16	27	7	4	3	14	15
2023	125	13	20	10	3	3	10	13

Other Postmortem Examinations

Hospital, Private, and Consultant Postmortem Examinations

Our office provides autopsy services to multiple area hospitals, private examinations to families searching for answers, and forensic autopsies to various counties in Michigan and Northern Indiana at their request.

	Hospital	Private	Consultant (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	198	222
2021	11	12	310	333
2022	10	17	316	343
2023	14	11	300	325

Referrals to Organ Procurement Organization

	Referrals to Gift of Life	Tissue Donations	Cornea Donations
Allegan	98	9	4
Barry	53	2	3
Berrien	216	24	12
Calhoun	200	24	15
Cass	69	12	6
Grand Traverse	92	5	0
Kalamazoo	267	23	15
Leelanau	13	0	0
Mason	50	3	1
Muskegon	182	9	4
St. Joseph	69	5	4
Van Buren	113	9	6
2023 Total	1422	125	70

Comparison of All Medical Examiner Counties

	Total ^[1] Population	Total Sq. Miles	Deaths in the County	Deaths Reported	Deaths Investigated	MEI Scene Investigations	DCs by ME	Cremation Permits	Unclaimed Investigations
Allegan	121,939	1,833	865	225	217	194	107	618	11
Barry	63,808	577	440	132	120	112	57	313	1
Berrien	152,261	1,581	1,695	626	520	466	271	1,193	15
Calhoun	133,366	718	1,444	509	459	407	209	1,074	32
Cass	51,642	508	372	157	150	145	70	285	5
Grand Traverse	96,421	601	1,618	515	411	308	228	1,379	11
Kalamazoo	262,215	580	3,250	1,083	850	751	475	2,458	39
Leelanau	23,019	2,532	187	38	38	28	12	163	2
Mason	29,159	1,242	308	105	96	93	46	264	0
Muskegon	176,564	1,459	1,988	724	549	503	310	1,561	21
St. Joseph	60,878	521	508	171	165	152	76	370	6
Van Buren	75,798	1,090	543	206	202	195	81	384	8
2023 Total	1,247,070	13,242	13,218	4,491	3,777	3,354	1,942	10,062	151
2022 Total	1,243,805	13,815	14,364	4,884	3,770	3,536	2,021	10,428	187

[1] Total county populations based on 2023 estimates by the US Census Bureau

Forensic Postmortem Examinations

	Complete Autopsies	% Complete Autopsies [1]	Limited Exams	External Exams	Total Postmortem Exams	% Postmortem Exams [2]	Cardiovascular Consults
Allegan	37	4.3%	8	38	83	9.6%	0
Barry	23	5.2%	1	15	39	8.9%	0
Berrien	130	7.7%	6	49	185	10.9%	1
Calhoun	106	7.3%	7	38	151	10.5%	0
Cass	35	9.4%	1	16	52	14.0%	0
Grand Traverse	75	4.6%	7	31	113	7.0%	1
Kalamazoo	193	5.9%	14	100	307	9.4%	0
Leelanau	1	0.5%	1	7	9	4.8%	0
Mason	22	7.1%	2	11	35	11.4%	0
Muskegon	147	7.4%	8	51	206	10.4%	0
St. Joseph	28	5.5%	4	21	53	10.4%	0
Van Buren	39	7.2%	2	21	62	11.4%	0
Consultant Counties	299	---	0	1	300	---	0
2023 Total	1,135	8.6% ^[3]	62	399	1,596	12.1% ^[4]	2
2022 Total	1,245	6.5% ^[3]	52	328	1,626	9.1% ^[4]	6 ^[5]

[1] Percent of all deaths in county with a complete autopsy
[2] Percent of all deaths in county with a postmortem examination
[3] Average percentage of all deaths in county with a complete autopsy
[4] Average percentage of all deaths in county with a postmortem examination
[5] This number was updated from 12 to 6 to reflect the accurate total of cardiovascular consults in 2022.

Manners of Death, All Medical Examiner Counties

	Natural	Accident	Suicide	Homicide	Indeterminate	2023 Total
Allegan	151	41	27	3	2	224
Barry	99	28	5	0	0	132
Berrien	449	120	29	13	14	625
Calhoun	375	84	26	15	8	508
Cass	114	24	10	1	6	155
Grand Traverse	331	152	16	1	9	509
Kalamazoo	732	273	35	28	10	1,078
Leelanau	29	4	5	0	0	38
Mason	77	16	10	1	0	104
Muskegon	504	157	39	13	10	723
St. Joseph	124	28	15	1	2	170
Van Buren	151	33	16	3	3	206
2023 Total	3,136	960	233	79	64	4,472
% of 2023 ^[1] Total	70%	21%	5%	2%	2%	100%
2022 Total	3,569	944	219	85	53	4,870

[1] Percent of all deaths reported to our office

Significant Death Statistics

	2023 Accidental Drug-Related Deaths	2023 Indeterminate Drug-Related Deaths	2023 Opioid- Related Deaths	Accidental Motor Vehicle-Related Deaths	Accidental Fall- Related Deaths
Allegan	9	0	6	13	15
Barry	9	0	7	7	10
Berrien	50	4	38	16	38
Calhoun	37	0	30	19	18
Cass	9	0	8	8	3
Grand Traverse	32	1	22	43	65
Kalamazoo	86	1	67	62	102
Leelanau	1	0	0	0	0
Mason	6	0	7	3	2
Muskegon	75	3	67	24	40
St. Joseph	8	0	6	10	5
Van Buren	14	0	9	3	8
2023 Total	336	9	267	208	306
2022 Total	311	7	255	208	312



MEDICAL EXAMINER AND
FORENSIC SERVICES

mimedicalexaminer.com

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1000 Oakland Drive

Kalamazoo, MI 49008

Monday-Friday

8am - 5pm

Holiday Exceptions

