



WESTERN MICHIGAN UNIVERSITY
Homer Stryker M.D.
SCHOOL OF MEDICINE

MEDICAL EXAMINER AND FORENSIC SERVICES



2021 Annual Report

OFFICE OF THE MEDICAL EXAMINER

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

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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.

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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.

- **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. 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, 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 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.
- ***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 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 in 2020 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 were able to resume this respectful disposition of remains in October, 2021.

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.

ALLEGAN COUNTY

Summary of All Allegan County Cases

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total Deaths in the County	602	657	705	753	745	788	772	819	974 ¹	958 ²
Deaths Reported to the ME	162	182	193	176	203	188	197	219	291	279
Deaths Investigated	145	164	189	170	192	164	191	199	278	264
MEI Scene Investigations	143	160	177	152	174	158	185	179	250	228
Death Certificates by ME	78	76	97	77	85	76	88	88	120	108
Bodies Transported to WMed	63	58	74	66	62	69	72	69	90	80
Complete Autopsy	43	49	63	32	36	45	41	37	54	51
Limited Autopsy	6	1	2	2	5	2	2	3	6	3
External Examination	11	5	7	18	17	13	24	21	23	19
Storage Only at WMed	3	3	2	14	4	9	5	8	7	7
Total Cases with Toxicology	54	54	70	47	52	54	59	55	79	69
Unidentified Remains After Exam	0	0	2	1	0	0	1	2	0	0
Referrals to Gift of Life	38	32	62	64	63	73	61	55	97	103
Tissue Donations	4	0	5	8	5	6	4	11	9	8
Cornea Donations	5	0	6	7	4	7	4	5	5	2
Unclaimed Investigations	2	1	2	3	1	2	2	8	9	10
Exhumations	0	0	0	0	0	0	0	0	0	0

Cremation Permit Authorizations, Allegan County

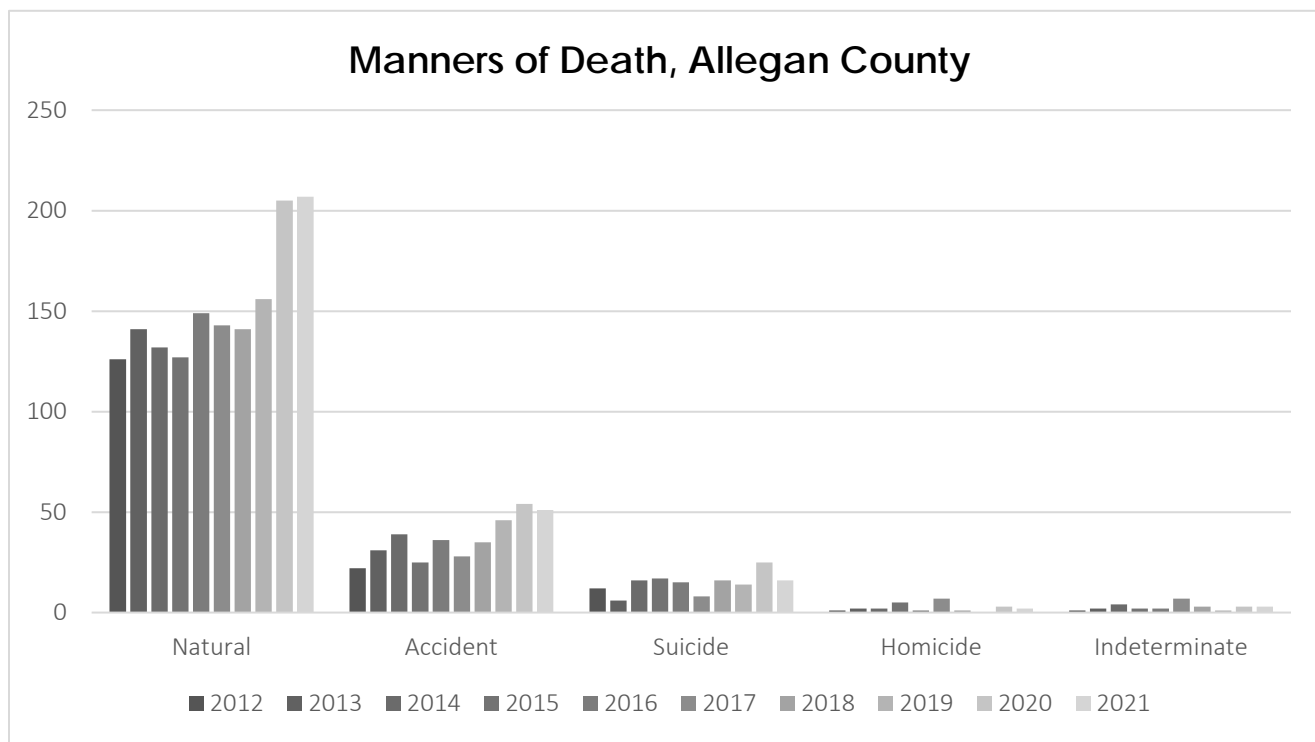
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Cremation Permits	299	350	409	404	442	469	487	519	650	644
% of Total Deaths with Cremation	50%	53%	58%	54%	60%	60%	63%	63%	67%	67%

¹ Updated total number of deaths occurring in the county

² Provisional total number of deaths occurring in the county

Manners of Death Reported, Allegan County

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Natural	126	141	132	127	149	143	141	156	205	207
Accident	22	31	39	25	36	28	35	46	54	51
Suicide	12	6	16	17	15	8	16	14	25	16
Homicide	1	2	2	5	1	2	1	0	3	2
Indeterminate	1	2	4	2	2	7	3	1	3	3 ¹
Total	162	182	193	176	203	188	196	217	290	279



Deaths Reported by Age (in years), Allegan County²

	< 1	1 - 5	6 - 10	11 - 17	18 - 25	26 - 44	45 - 64	65 +
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

¹ (1) Thermal injuries and inhalation of products of combustion, residential fire of unknown etiology; (1) Skeletal remains, unknown cause and manner of death; (1) Blunt force injuries of head of unknown etiology

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

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

Pediatric Deaths, Allegan County

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

1. 11-17 years old
 - a. (1) Cerebral palsy with seizure disorder associated with prematurity; natural

Accidental Deaths by Mechanism, Allegan County

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Vehicle	13	9	11	10	9	12	12	9	18	8 ¹
Drug-Related	3	10	20	7	11	10	9	17	14	13
Drowning	0	1	1	0	1	3	3	1	3	6 ²
Fall	2	7	5	5	10	3	10	12	15	21 ³
Fire	3	1	0	0	0	0	0	1	0	2
Environmental Exposure	0	1 ⁴	0	2	1	0	0	1	2	0
Asphyxia	1	0	0	0	2	0	2	3	2	0
Other	0	2	2	1	2	0	0	2	0	1 ⁵
Total	22	31	39	25	36	28	35⁶	46	54	51

¹ Includes (1) Sudden cardiac event associated with a motor vehicle collision and illicit drug use

² Includes (1) Drowning (bathtub) associated with mixed drug intoxication

³ Includes (1) Fall associated with acute alcohol intoxication

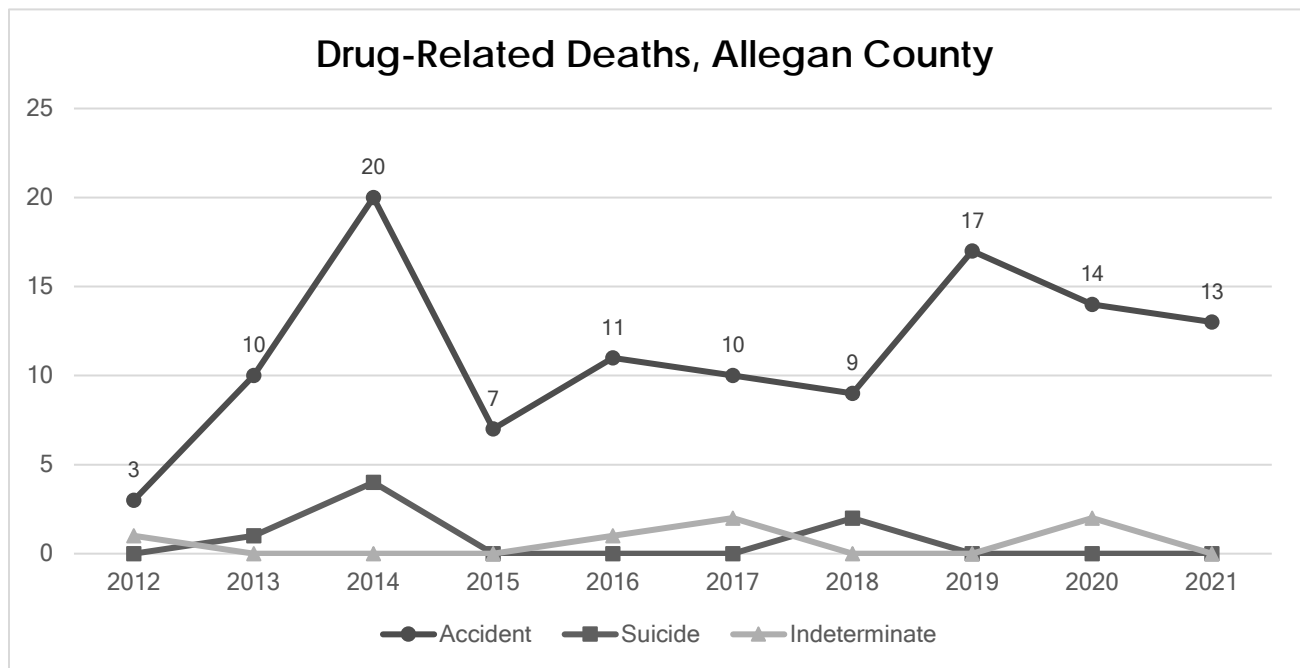
⁴ After careful review, this number was corrected from 2 to 1

⁵ (1) Electrocution (autoerotic)

⁶ (1) Death categorized twice (drowning & drug-related)

Drug-Related Deaths by Manner, Allegan County¹

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Accident	3	10	20	7	11	10	9	17	14	13 ²
Suicide	0	1	4	0	0	0	2	0	0	0
Indeterminate	1	0	0	0	1	2	0	0	2	0
Total	4	11	24	7	12	12	11	17	16	13
Total involving opioid(s)	N/A	N/A	N/A	6	8	6	8	13	11	9
% of Accidental and Indeterminate Deaths Involving Opioids	N/A	N/A	N/A	86%	67%	50%	78%	76%	69%	69%



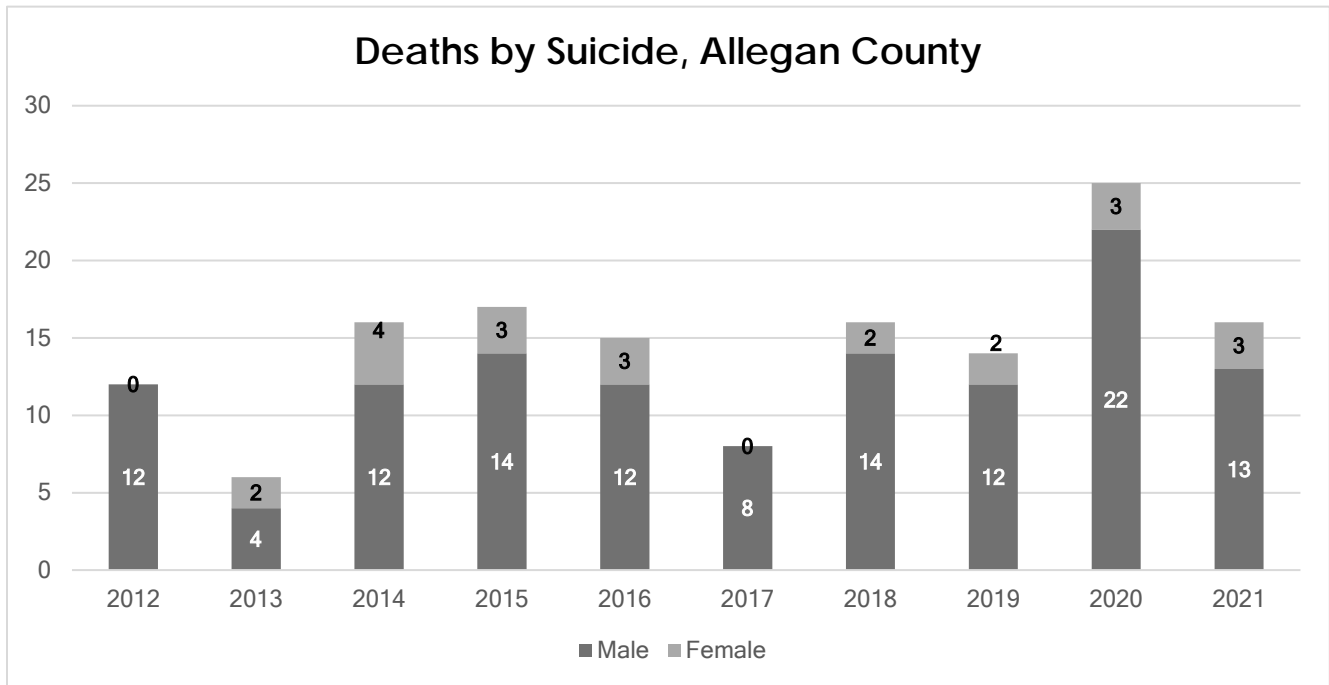
Suicides by Sex & Age, Allegan County

Year	Total	Male	Female	0 – 17	18 - 25	26 - 44	45 - 64	65 +
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

¹ Acute alcohol intoxications are defined as drug-related deaths and are included in this data

² Includes (1) Chloroethane (toxic chemical) inhalation

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



Suicides by Mechanism, Allegan County

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Firearm	9	3	11	11	10	7	8	6	15	12
Hanging	3	0	1	4	4	0	5	6	7	3
Carbon Monoxide	0	1	0	0	1	1	0	0	1	0
Drug Intoxication	0	1	4	0	0	0	1	0	0	0
Motor Vehicle	0	1	0	0	0	0	1	0	1	0
Sharp Force Trauma	0	0	0	0	0	0	0	1	0	1
Asphyxia/Suffocation	0	0	0	2	0	0	0	0	0	0
Other	0	0	0	0	0	0	1	1	1	0
Total	12	6	16	17	15	8	16	14	25	16

BARRY COUNTY

Summary of All Barry County Cases¹

	2015	2016 ²	2018	2019	2020	2021
Total Deaths in the County	416	399	390	399	453 ³	529 ⁴
Deaths Reported to the ME	125	130	146	121	161	155
Deaths Investigated	118	124	131	108	147	143
MEI Scene Investigations	112	120	128	103	132	135
Death Certificates by ME	53	57	52	54	52	53
Bodies Transported to WMed	43	47	41	38	35	41
Complete Autopsy	35	37	25	28	22	23
Limited Autopsy	1	0	1	2	2	1
External Examination	6	8	12	8	7	13
Storage Only at WMed	1	2	3	0	4	4
Total cases with Toxicology	N/A	N/A	35	37	28	35
Unidentified Remains After Exam	N/A	N/A	0	0	0	0
Referrals to Gift of Life	40	48	44	22	44	54
Tissue Donations ⁵	6	17	3	3	2	6
Cornea Donations	N/A	N/A	0	1	1	4
Unclaimed Investigations	1	0	1	0	4	2
Exhumations	N/A	N/A	0	0	0	0

Cremation Permit Authorizations, Barry County

	2018	2019	2020	2021
Cremation Permits	262	251	303	354
% of Total Deaths with Cremation	67%	63%	67%	67%

¹ Data for 2017 is not available at the time this report is authored

² Data from years 2015-2016 obtained from Sparrow Hospital

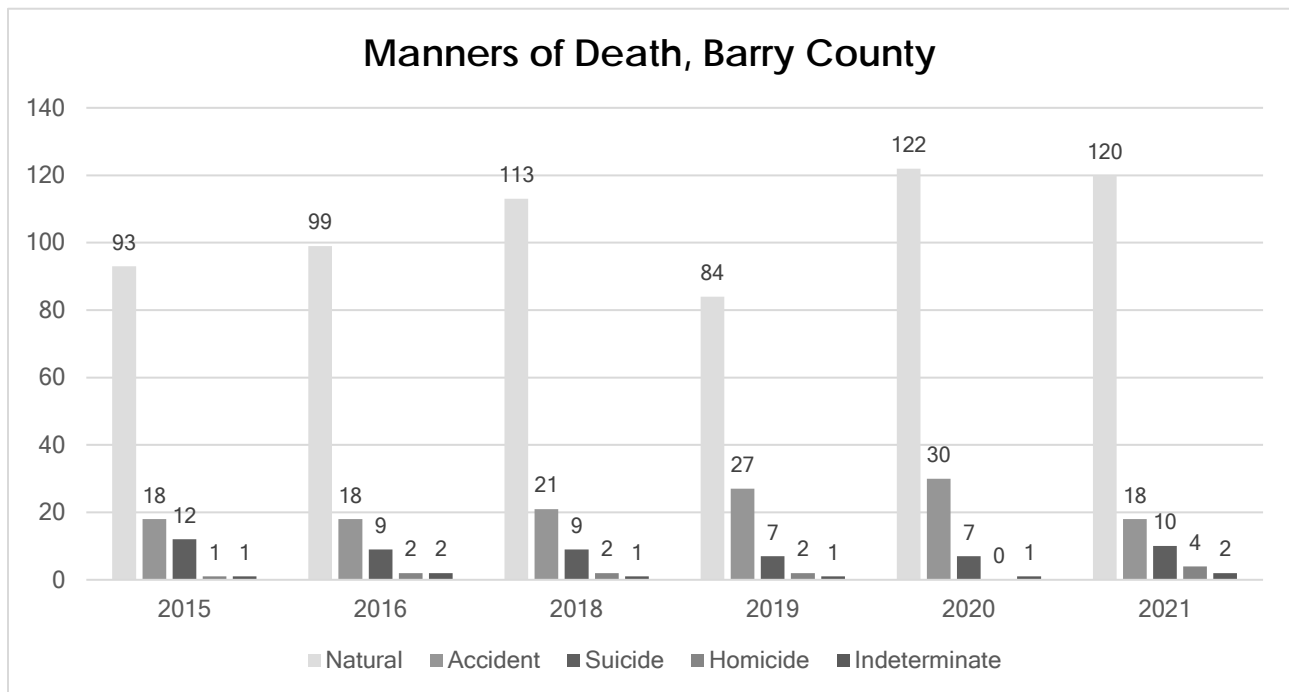
³ Updated total number of deaths occurring in the county

⁴ Provisional total number of deaths occurring in the county

⁵ 2015 and 2016 data include both tissue and cornea donations combined

Manners of Death Reported, Barry County¹

	2015	2016	2018	2019	2020	2021
Natural	93	99	113	84	122	120
Accident	18	18	21	27	30	18
Suicide	12	9	9	7	7	10
Homicide	1	2	2	2	0	4
Indeterminate	1	2	1	1	1	2 ²
Total	125	130	146	121	160	154³



Deaths Reported by Age (in years), Barry County⁴

	< 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

¹ Data from years 2015-2016 obtained from Sparrow Hospital

² (1) Skeletonized remains located outdoors, unknown cause and manner of death; (1) Multiple methods of asphyxiation, skeletonized remains

³ Does not include (1) Stillbirth investigation

⁴ 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 two deaths of individuals under 18 years of age include:

1. 11-17 years old
 - a. (1) Arrow wound of chest; homicide
 - b. (1) Intraoral gunshot wound; suicide

Accidental Deaths by Mechanism, Barry County

	2018	2019	2020	2021
Vehicle	7	11	6	4
Drug-Related	4	5	10	4
Drowning	0	3	1	2 ¹
Fall	8	4	10	7
Fire	0	1	0	0
Environmental Exposure	0	1	0	0
Asphyxia	1	2	1	0
Other	1	0	2	1 ²
Total	21	27	30	18

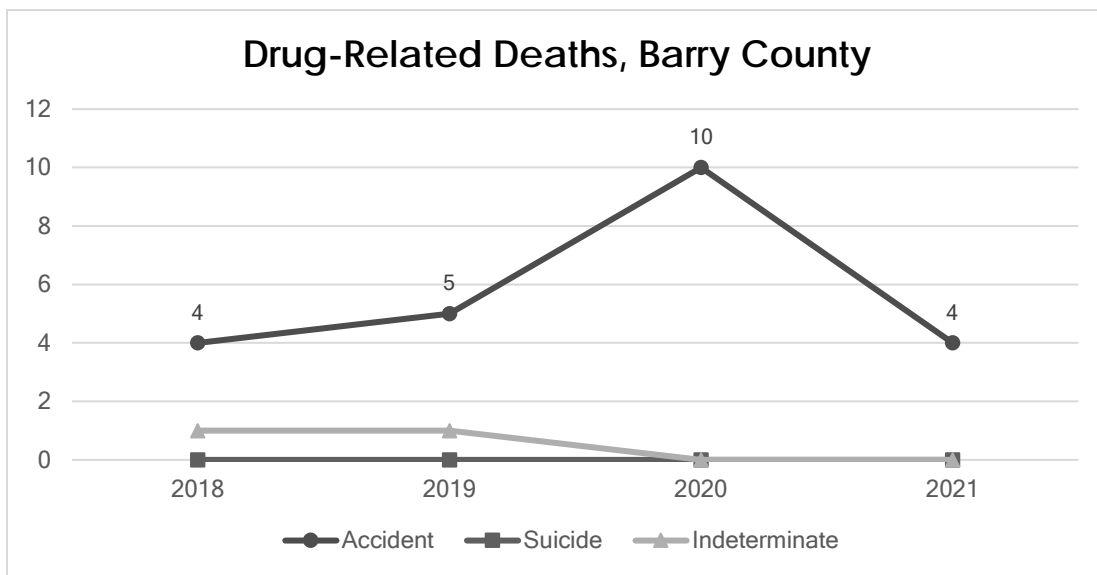
Drug-Related Deaths by Manner, Barry County³

	2018	2019	2020	2021
Accident	4	5	10	4
Suicide	0	0	0	0
Indeterminate	1	1	0	0
Total	5	6	10	4
Total involving opioid(s)	2	4	8	4
% of Accidental and Indeterminate Deaths Involving Opioids	40%	67%	80%	100%

¹ Includes (1) Drowning (in bathtub) associated with illicit drug use

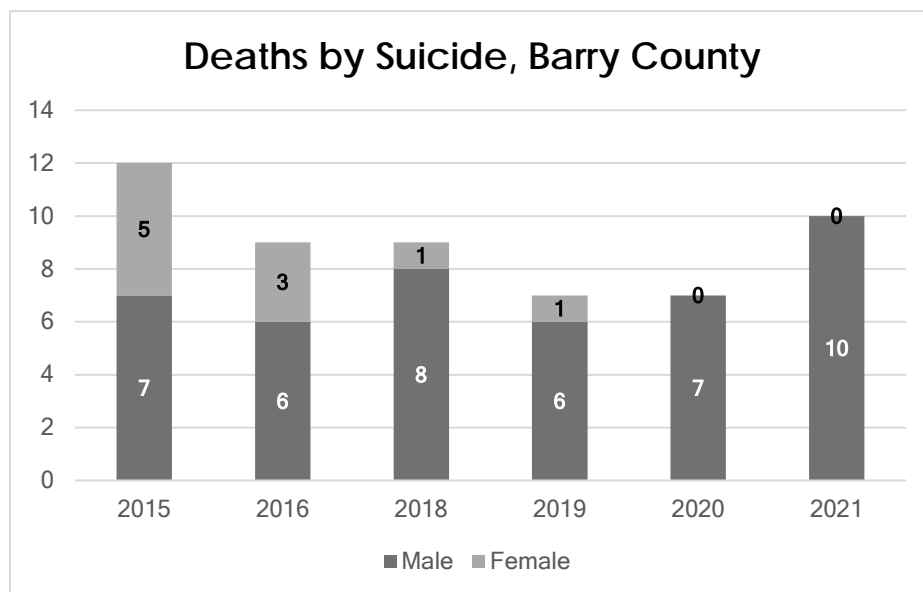
² (1) Acute hemorrhage due to extremity wound of unknown etiology

³ 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
2021	10	10	0	1	1	1	3	4



Suicides by Mechanism, Barry County

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

BERRIEN COUNTY

Summary of All Berrien County Cases

	2019	2020	2021
Total Deaths in the County	1,622	1,873 ¹	1,913 ²
Deaths Reported to the ME	430	596	604
Deaths Investigated	399	540	548
MEI Scene Investigations	353	461	484
Death Certificates by ME	152	207	215
Bodies Transported to WMed	132	152	159
Complete Autopsy	90	103	116
Limited Autopsy	5	4	3
External Examination	26	25	26
Storage Only at WMed	11	20	14
Total Cases with Toxicology	110	126	134
Unidentified Remains After Exam	1	3	1 ³
Referrals to Gift of Life	80	137	156
Tissue Donations	7	8	7
Cornea Donations	4	7	4
Unclaimed Investigations	10	19	17
Exhumations	1	0	2

Cremation Permit Authorizations, Berrien County

	2019	2020	2021
Cremation Permits	1,045	1,218	1,219
% of Total Deaths with Cremation	64%	65%	64%

¹ Updated total number of deaths occurring in the county

² Provisional total number of deaths occurring in the county

³ (1) Human remains exhumed for potential identification purposes

Manners of Death Reported, Berrien County

	2019	2020	2021
Natural	321	470	458
Accident	71	87	105
Suicide	21	21	10
Homicide	8	8	13
Indeterminate	9	6	12 ¹
Total	430	592	598²

Deaths Reported by Age (in years), Berrien County³

	< 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

Pediatric Deaths, Berrien County

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

1. <1 year old
 - a. (1) Viral pneumonitis; natural
 - b. (3) Sudden unexplained infant death associated with unsafe sleep; indeterminate
 - c. (1) Extreme prematurity; natural
2. 11-17 years old
 - a. (1) Gunshot wounds of head; homicide
 - b. (1) Multiple injuries, passenger in motor vehicle collision; accident
 - c. (1) Hanging; suicide
 - d. (1) Sepsis; natural

¹ (1) Choking associated with seizure disorder of unknown etiology (possibly trauma-related); (1) Complications of remote traumatic brain injury of unknown etiology; (1) Complications of splenic laceration of unknown etiology; (1) Acute drug intoxication; (4) Smoke inhalation and thermal injuries, residential fire; (1) Gunshot wound of head; (3) Sudden unexplained infant death associated with unsafe sleep

² Does not include (3) Stillbirth investigations; (1) Human remains exhumed for potential identification purposes; (2) Pending cause and manner at the time of this report

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, Berrien County

	2019	2020	2021
Vehicle	21	15	24
Drug-Related	23	37	36
Drowning	4	9	3
Fall	12	15	34
Fire	2	2	1
Environmental Exposure	3	4	2
Asphyxia	3	4	3 ¹
Other	3	1	2 ²
Total	71	87	105

Drug-Related Deaths by Manner, Berrien County³

	2019	2020	2021
Accident	23	37	36
Suicide	2	1	0
Indeterminate	1	0	1
Total	26	38	37
Total involving opioid(s)	22	29	28
% of Accidental and Indeterminate Deaths Involving Opioids	92%	78%	76%

¹ (3) Asphyxia due to choking (food)

² (1) Probable electrocution; (1) Exsanguination from scalp due to blunt head injury

³ Acute alcohol intoxications are defined as drug-related deaths and are included in this data

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
2021	10	9	1	1	2	3	0	4

Suicides by Mechanism, Berrien County

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

CALHOUN COUNTY

Summary of All Calhoun County Cases

	2014	2015	2016	2017	2018	2019	2020	2021
Total Deaths in the County	1,390	1,378	1,427	1,396	1,495	1,521	1,786 ¹	1,796 ²
Deaths Reported to the ME	377	429	411	443	475	508	585	582
Deaths Investigated	335	392	361	400	415	442	518	534
MEI Scene Investigations	296	311	307	352	387	381	450	444
Death Certificates by ME	178	180	186	191	200	176	194	244
Bodies Transported to WMed	138	164	165	176	170	146	172	188 ³
Complete Autopsy	103	109	103	102	103	81	112	112
Limited Autopsy	1	5	4	3	8	8	6	3
External Examination	20	28	36	46	38	32	27	45
Storage Only at WMed	14	20	22	25	21	25	27	27
Total Cases with Toxicology	122	131	113	141	139	112	136	156
Unidentified Remains After Exam	0	0	0	0	0	0	0	0
Referrals to Gift of Life	119	115	118	146	107	72	102	135
Tissue Donations	8	3	11	10	11	6	11	9
Cornea Donations	8	8	11	8	9	3	5	10
Unclaimed Investigations	13	8	11	23	24	29	40	32
Exhumations	1	0	0	0	0	0	0	0

Cremation Permit Authorizations, Calhoun County

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

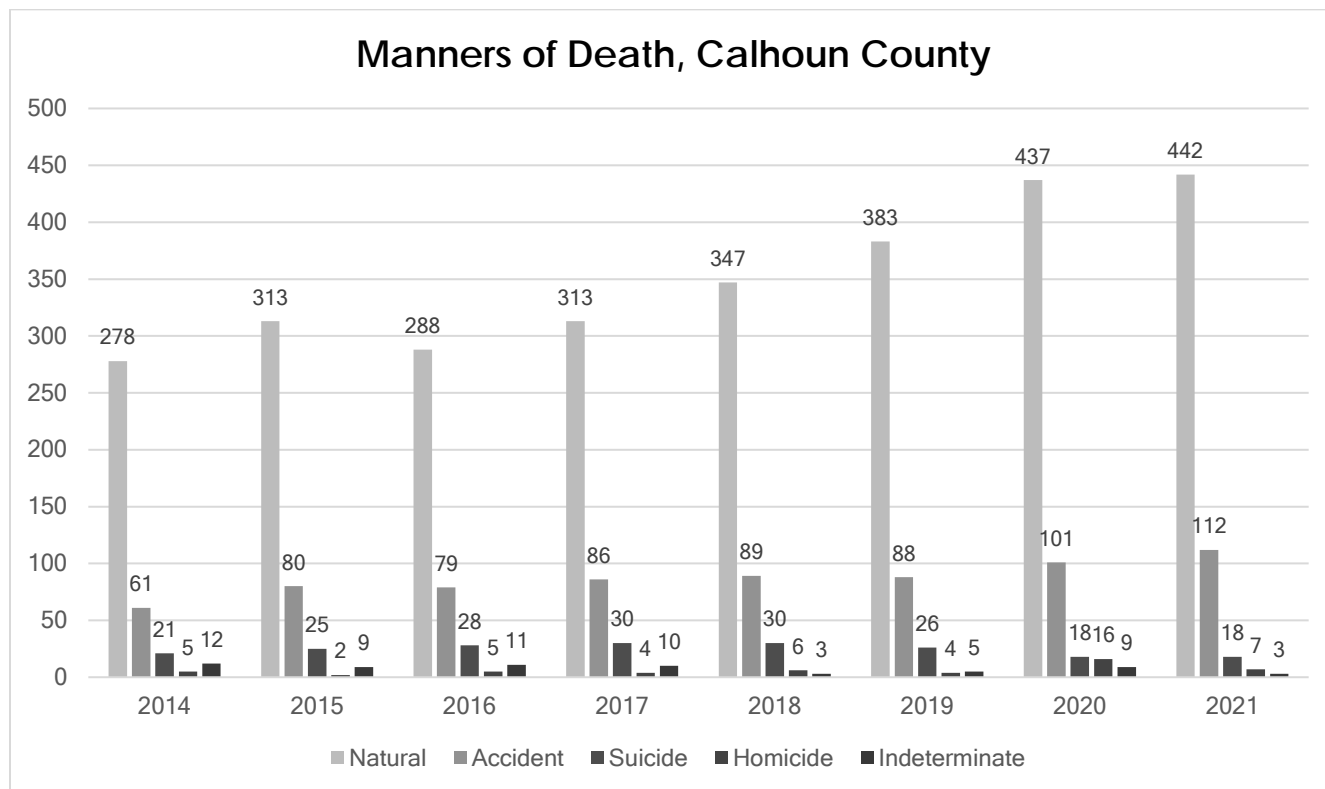
¹ Updated total number of deaths occurring in the county

² Provisional total number of deaths occurring in the county

³ Includes (1) Toxicology only examination

Manners of Death Reported, Calhoun County

	2014	2015	2016	2017	2018	2019	2020	2021
Natural	278	313	288	313	347	383	437	442
Accident	61 ¹	80	79	86	89	88	101	112
Suicide	21	25	28	30	30	26	18	18
Homicide	5	2	5	4	6	4	16	7
Indeterminate	12	9	11	10	3	5	9	3 ²
Total	377	429	411	443	475	506	581	582



Deaths Reported by Age (in years), Calhoun County³

	< 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

¹ After careful review, this number was corrected from 60 to 61

² (1) Blunt force injuries, pedestrian vs train; (1) Partially skeletonized remains, cause and manner of death could not be determined; (1) Found in river, cause and manner of death could not be determined

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

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

Pediatric Deaths, Calhoun County

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

1. <1 year old
 - a. (1) Sepsis and meningitis due to Haemophilus influenza; natural
 - b. (2) Extreme prematurity; natural

Accidental Deaths by Mechanism, Calhoun County

	2014	2015	2016	2017	2018	2019	2020	2021
Vehicle	11	21	20	14	15	15	20	17 ¹
Drug-Related	26	44	38	44	49	40	50	59 ²
Drowning	0	2	2	3	1	4	2	1
Fall	15	11	14	19	19	20	19	28
Fire	2	0	1	0	1	1	0	0
Environmental Exposure	2	0	0	0	0	3	5	2
Asphyxia	4	2 ³	2	5	3	2	4	1 ⁴
Other	1	1	2	1	1	3	1	4 ⁵
Total	61⁶	81⁷	79	86	89	88	101	112

¹ Includes (1) Multiple injuries, including traumatic asphyxia while entering moving vehicle

² Includes (1) Mixed drug intoxication associated with positional asphyxia

³ After careful review, this number was corrected from 0 to 2

⁴ (1) Choking associated with mixed drug intoxication

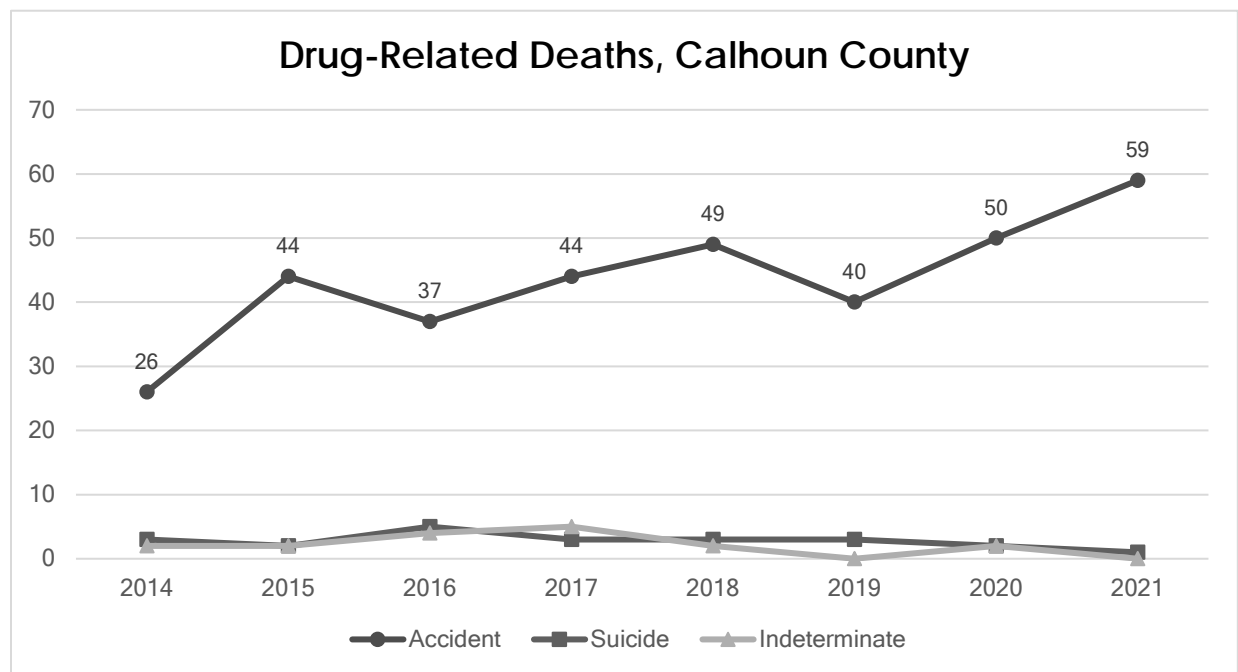
⁵ (1) Carbon monoxide poisoning; (1) Complications of quadriplegia due to diving accident; (1) Caustic ingestion of cleaning solution; (1) Exsanguination due to spontaneous disruption of hemodialysis AV fistula

⁶ After careful review, this number was corrected from 62 to 61 and some of the deaths have been re-categorized

⁷ (1) Death categorized twice (drowning and drug)

Drug-Related Deaths by Manner, Calhoun County¹

	2014	2015	2016	2017	2018	2019	2020	2021
Accident	26	44	37	44	49	40	50	59
Suicide	3	2	5	3	3	3	2	1
Indeterminate	2	2	4	5	2	0	2	0
Total	31	48	46	52	54	43	54	60
Total involving opioid(s)	N/A	42	40	48	48	36	46	49
% of Accidental and Indeterminate Deaths Involving Opioids	N/A	91%	88%	94%	92%	88%	87%	83%

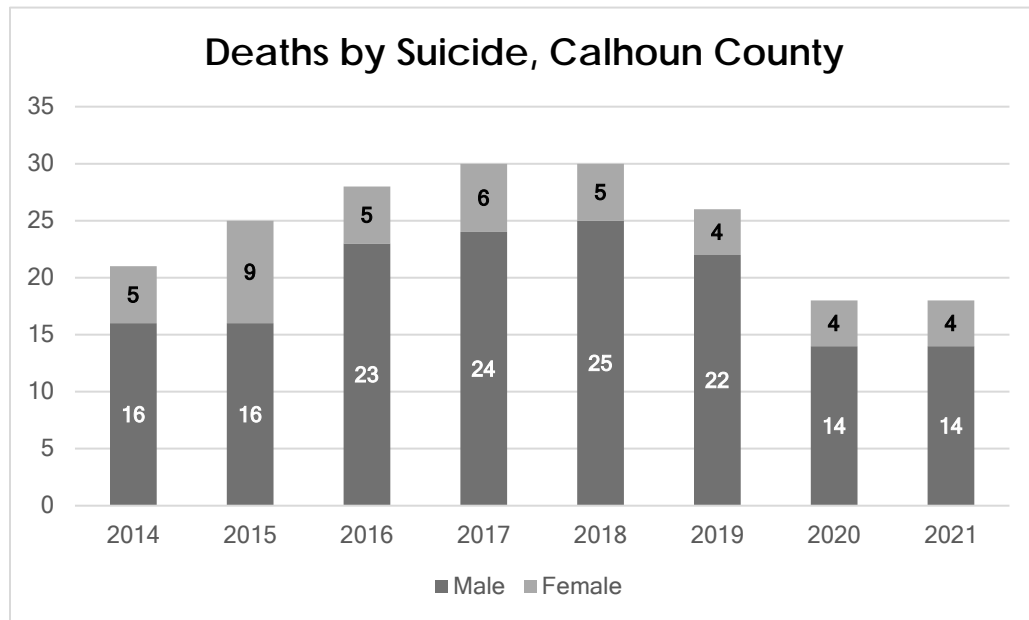


Suicides by Sex & Age, Calhoun County

Year	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

¹ Acute alcohol intoxications are defined as drug-related deaths and are included in this data

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



Suicides by Mechanism, Calhoun County

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

CASS COUNTY

Summary of All Cass County Cases¹

	2021
Total Deaths in the County	419 ²
Deaths Reported to the ME	147
Deaths Investigated	143
MEI Scene Investigations	140
Death Certificates by ME	66
Bodies Transported to WMed	46
Complete Autopsy	28
Limited Autopsy	1
External Examination	13
Storage Only at WMed	4
Total Cases with Toxicology	42
Unidentified Remains After Exam	0
Referrals to Gift of Life	56
Tissue Donations	4
Cornea Donations	2
Unclaimed Investigations	4
Exhumations	0

Cremation Permit Authorizations, Cass County³

	2021
Cremation Permits	262
% of Total Deaths with Cremation	63%

¹ Data provided includes January 1 to December 31, 2021, but WMed served as ME for only February 1 to December 31, 2021

² Provisional total number of deaths occurring in the county

³ Data provided includes February 1 to December 31, 2021

Manners of Death Reported, Cass County¹

2021	
Natural	105
Accident	30
Suicide	7
Homicide	3
Indeterminate	1 ²
Total	146³

Deaths Reported by Age (in years), Cass County⁴

	< 1	1 - 5	6 - 10	11 - 17	18 - 25	26 - 44	45 - 64	65 +
2021	0	1	0	1	8	20	43	73

Pediatric Deaths, Cass County

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

1. 1-5 years old
 - a. (1) Multiple injuries, passenger in motor vehicle collision; accident
2. 11-17 years old
 - a. (1) Gunshot wound of head; homicide

Drug-Related Deaths by Manner, Cass County⁵

2021	
Accident	7
Suicide	1
Indeterminate	1
Total	9
Total involving opioid(s)	8
% of Accidental and Indeterminate Deaths Involving Opioids	88%

¹ Data provided includes January 1 to December 31, 2021, but WMed served as ME for only February 1 to December 31, 2021

² (1) Mixed drug intoxication

³ Does not include (1) stillbirth investigation

⁴ 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

⁵ Acute alcohol intoxications are defined as drug-related deaths and are included in this data

Accidental Deaths by Mechanism, Cass County

2021

Vehicle	17
Drug-Related	7
Drowning	0
Fall	1
Fire	3
Environmental Exposure	1 ¹
Asphyxia	0
Other	1 ²
Total	30

Suicides by Sex & Age, Cass County

<i>Year</i>	Total	Male	Female	0 - 17	18 - 25	26 - 44	45 - 64	65 +
2021	7	5	2	0	0	3	2	2

Suicides by Mechanism, Cass County

2021

Firearm	4 ³
Hanging	1
Carbon Monoxide	0
Drug Intoxication	1
Motor Vehicle	0
Sharp Force Trauma	1
Asphyxia/Suffocation	0
Other	0
Total	7

¹ (1) Hypothermia associated with COVID-19 infection and illicit drug use

² (1) Carbon monoxide intoxication

³ Includes (1) Gunshot wound of head associated with smoke and soot inhalation (intentionally set residential fire)

GRAND TRAVERSE COUNTY

Summary of All Grand Traverse County Cases

	2017	2018	2019	2020	2021
Total Deaths in the County	1,306	1,413	1,345	1,572 ¹	1,780 ²
Deaths Reported to the ME	380	350	384	495	579
Deaths Investigated	249	252	278	375	396
MEI Scene Investigations	122	206	212	211	246
Death Certificates by ME	153	126	131	158	159
Bodies Transported to WMed	77	58	65	69	80
Complete Autopsy	56	45	52	53	60
Limited Autopsy	2	0	2	3	2
External Examination	19	13	12	13	17
Storage Only at WMed	0	0	0	0	1
Total Cases with Toxicology	73	53	61	64	75
Unidentified Remains After Exam	1	2	0	1	0
Referrals to Gift of Life	44	37	43	49	75
Tissue Donations	4	3	1	7	4
Cornea Donations	4	2	0	2	0
Unclaimed Investigations	5	7	10	12	13
Exhumations	0	0	0	0	0

Cremation Permit Authorizations, Grand Traverse County

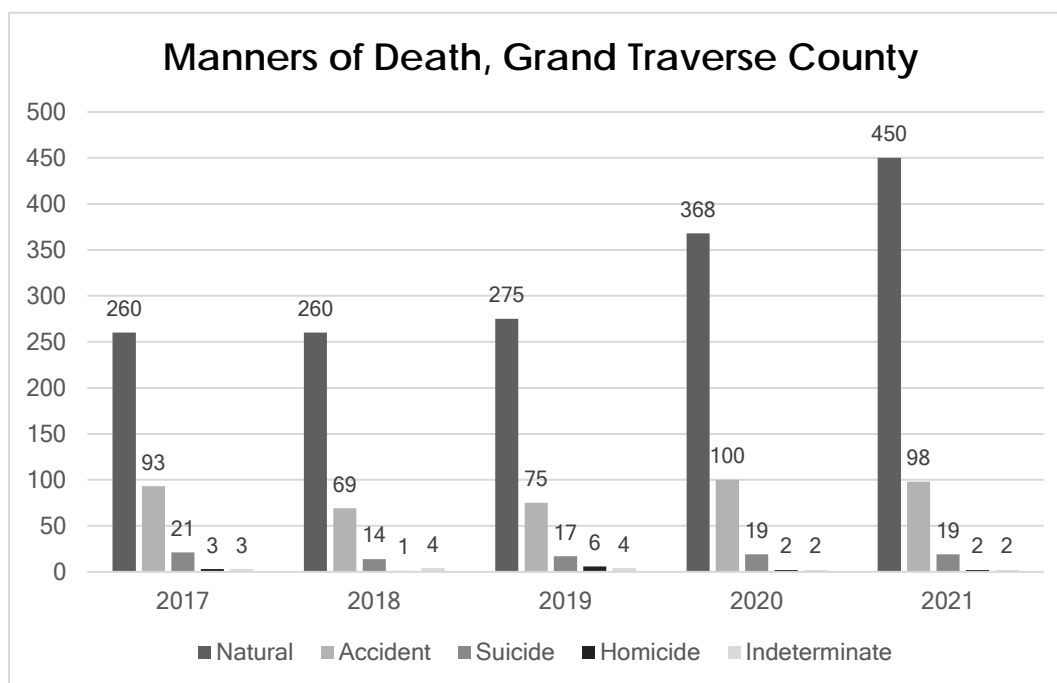
	2017	2018	2019	2020	2021
Cremation Permits	1,005	1,108	1,077	1,283	1,426
% of Total Deaths with Cremation	76%	78%	80%	82%	80%

¹ Updated total number of deaths occurring in the county

² Provisional total number of deaths occurring in the county

Manners of Death Reported, Grand Traverse County

	2017	2018	2019	2020	2021
Natural	260	260	275	368	450
Accident	93	69	75	100	98
Suicide	21	14	17	19	19
Homicide	3	1	6	2	2
Indeterminate	3	4	4	2	2 ¹
Total	380	348	377	491	571²



Deaths Reported by Age (in years), Grand Traverse County³

	< 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	122	314
2021	0	2	0	3	6	45	115	400

¹ (1) Drowning, unwitnessed; (1) Complications of placental abruption

² Does not include (8) 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

Pediatric Deaths, Grand Traverse County

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

1. 1-5 years old
 - a. (1) Gunshot wound of head; homicide
 - b. (1) Multiple injuries, pedestrian vs motor vehicle; accident
2. 11-17 years old
 - a. (2) Hanging; suicide
 - b. (1) Multiple blunt force injuries, bicyclist vs motor vehicle; accident

Accidental Deaths by Mechanism, Grand Traverse County

	2017	2018	2019	2020	2021
Vehicle	23	15	22	18	23
Drug-Related	19	9	10	19	16
Drowning	2	2	2	6	3
Fall	44	35	34	47	46
Fire	2	1	1	1	1
Environmental Exposure	0	1	0	4	2
Asphyxia	1	3	4	3	3 ¹
Other	2	3	2	2	4 ²
Total	93	69	75	100	98

Drug-Related Deaths by Manner, Grand Traverse County³

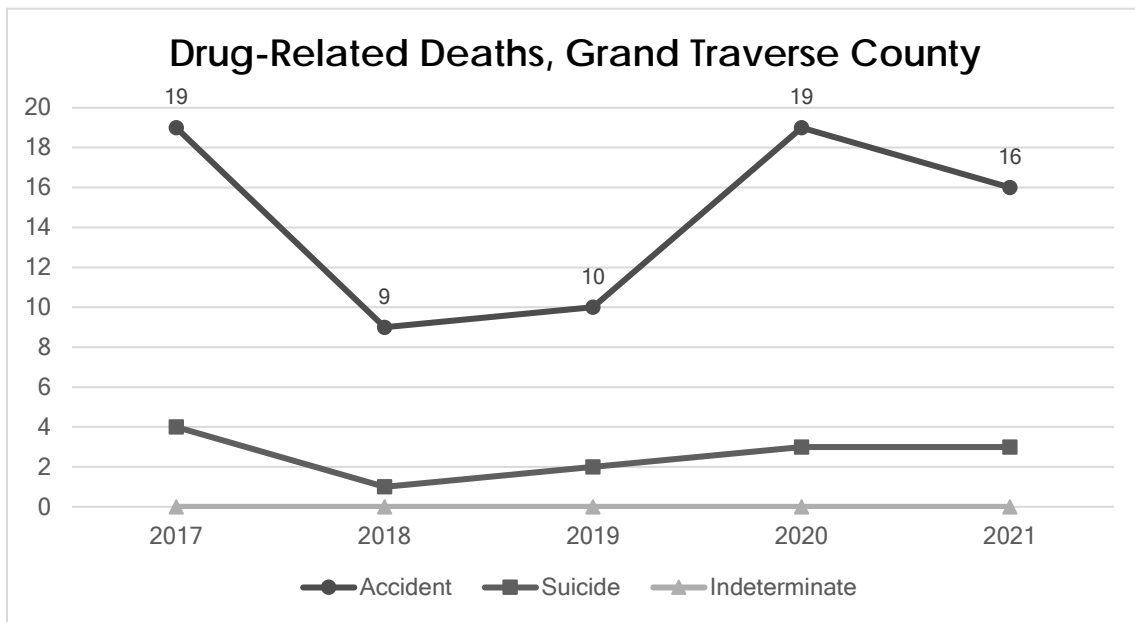
	2017	2018	2019	2020	2021
Accident	19	9	10	19	16
Suicide	4	1	2	3	3 ⁴
Indeterminate	0	0	0	0	0
Total	23	10	12	22	19
Total involving opioid(s)	18	8	8	15	16
% of Accidental and Indeterminate Deaths Involving Opioids	84%	89%	70%	68%	100%

¹ (1) Hanging; (1) Asphyxia due to choking; (1) Traumatic asphyxia due to chest compression

² (1) Carbon monoxide poisoning associated with acute drug intoxication; (1) Complications of quadriplegia due to diving accident; (1) Multiple blunt force injuries, collision with fixed object while skiing; (1) Complications of lower extremity fractures while undergoing transfer from table to chair

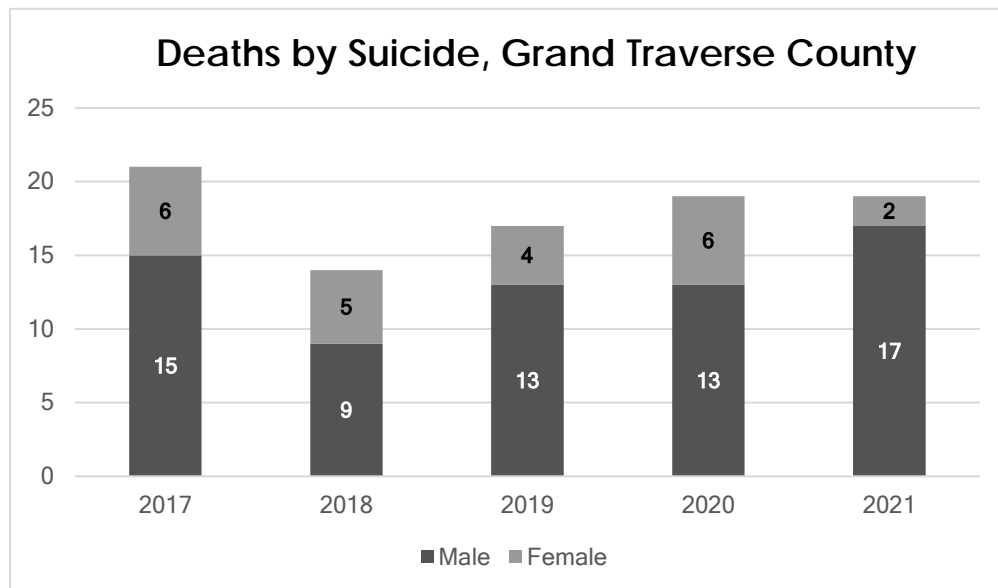
³ Acute alcohol intoxications are defined as drug-related deaths and are included in this data

⁴ Includes (1) Mixed drug intoxication associated with hyperthermia



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
2021	19	17	2	2	1	5	4	7



Suicides by Mechanism, Grand Traverse County

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

¹ Includes (1) Gunshot wound of head associated with smoke and soot inhalation due to motor vehicle crash

² (1) Carbon monoxide poisoning associated with acute drug intoxication; (1) Carbon monoxide poisoning associated with probable other substances (could not be confirmed due to extended hospital stay)

³ Includes (1) Mixed drug intoxication associated with hyperthermia

⁴ (1) Drowning associated with mixed drug intoxication

KALAMAZOO COUNTY

Summary of All Kalamazoo County Cases

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total Deaths in the County	2,540	2,668	2,684	2,733	2,879	2,840	2,977	2,921	3,446 ¹	3,580 ²
Deaths Reported to the ME	778	777	750	810	975	991	1,068	1,060	1,242	1,283
Deaths Investigated	556	580	560	646	745	733	782	781	931	1,002
MEI Scene Investigations	503	549	411	434	560	627	677	650	746	821
Death Certificates by ME	362	358	355	306	390	406	405	401	449	496
Bodies Transported to WMed	233	241	253	247	318	307	330	290	302	366 ³
Complete Autopsy	187	193	174	142	192	189	187	180	188	222
Limited Autopsy	4	4	6	7	7	4	9	7	6	5
External Examination	34	37	37	52	60	64	68	62	60	82
Storage Only at WMed	8	7	36	46	59	50	62	41	44	55
Total Cases with Toxicology	212	222	198	174	222	238	238	224	236	292
Unidentified Remains After Exam	0	0	0	0	0	0	1	0	1	0
Referrals to Gift of Life	46	65	95	113	161	156	129	136	161	226
Tissue Donations	4	4	6	9	22	16	16	17	17	19
Cornea Donations	4	9	9	9	20	10	7	7	10	12
Unclaimed Investigations	9	7	10	10	10	13	41	40	48	51
Exhumations	0	0	0	0	1	0	0	0	0	0

Cremation Permit Authorizations, Kalamazoo County

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Cremation Permits	1,467	1,740	1,782	1,672	1,856	1,920	2,101	2,028	2,492	2,594
% of Total Deaths with Cremation	58%	65%	66%	61%	64%	68%	71%	70%	72%	72%

¹ Updated total number of deaths occurring in the county

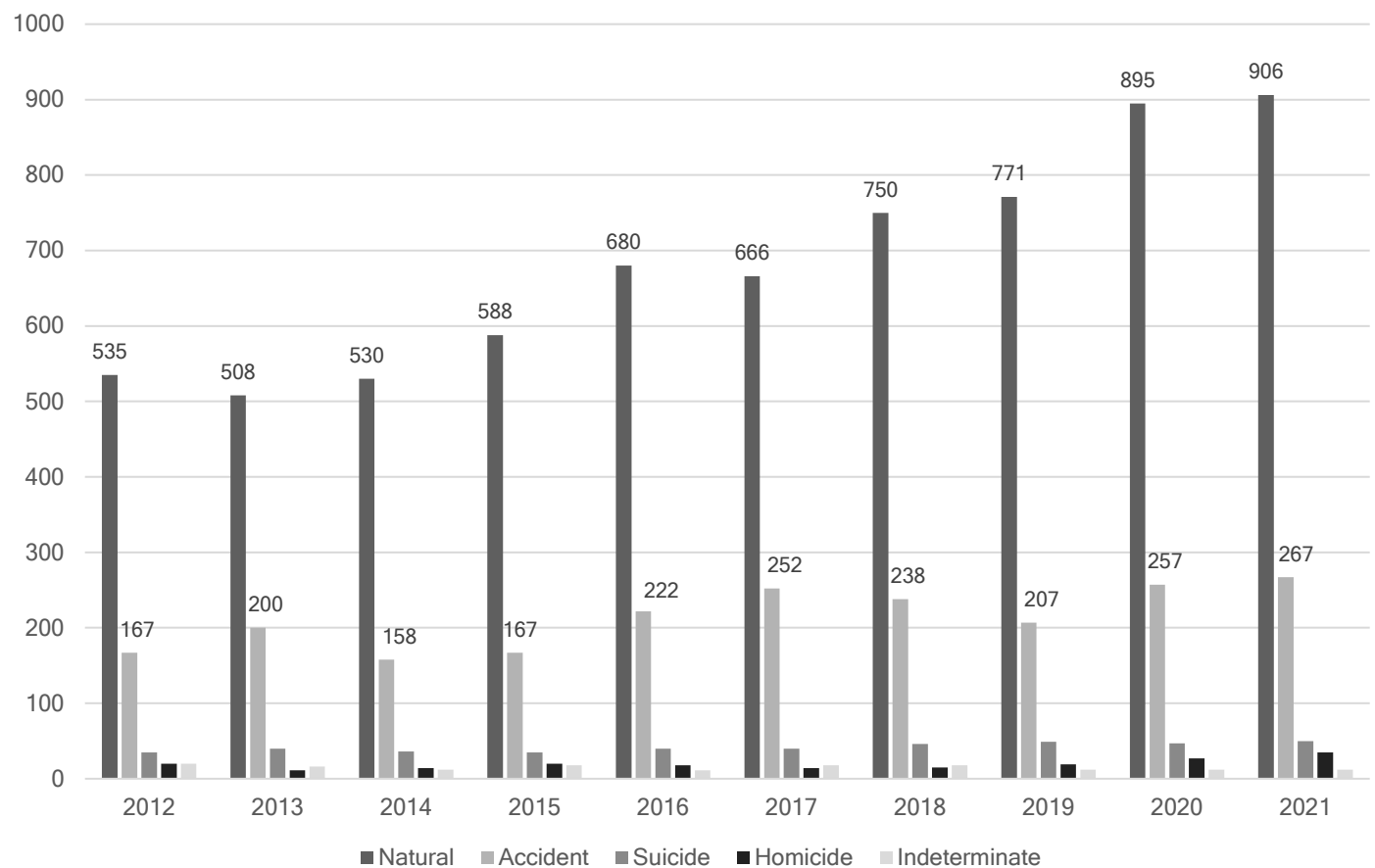
² Provisional total number of deaths occurring in the county

³ Includes (2) Toxicology only examinations

Manners of Death Reported, Kalamazoo County

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Natural	535	508	530	588	680 ¹	666	750	771	895	906
Accident	167	200	158	151	222	252	238	207	257	267
Suicide	35	40	36	38	40	40	46	49	47	50
Homicide	20	11	14	14	18	14	15	19	27	35
Indeterminate	20	16	12	19	11	18	17	12	12	12 ²
Total	777	775	750	810	971	990	1066	1058	1238	1270³

Manners of Death, Kalamazoo County



¹ After careful review, this number was corrected from 681 to 680

² (1) Found dead in bed, family declined autopsy, cause and manner of death could not be determined; (1) Found in water, cause and manner of death could not be determined; (1) Gunshot wound of head, intention of discharge is unknown; (1) Gunshot wound of neck, found adjacent to motor vehicle accident; (1) Mixed drug intoxication; (1) Acute drug intoxication with prolonged hospitalization; (1) Sudden unexplained infant death associated with unsafe sleep and seizure disorder; (1) Sudden unexplained infant death associated with unsafe sleep and small for gestational age; (1) Sudden unexplained infant death associated with unsafe sleep and bronchiolitis of unknown etiology/significance; (1) Complications of head trauma of unknown etiology; (1) Complications of head trauma of unknown etiology associated with substance use; (1) Head trauma of unknown etiology associated with illicit drug use

³ Does not include (2) Pending cause and manner of death at the time of this report; (11) Stillbirth investigations

Deaths Reported by Age (in years), Kalamazoo County¹

	< 1	1 - 5	6 - 10	11 - 17	18 - 25	26 - 44	45 - 64	65 +
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
2021	5	5	1	5	36	153	371	696

Pediatric Deaths, Kalamazoo County

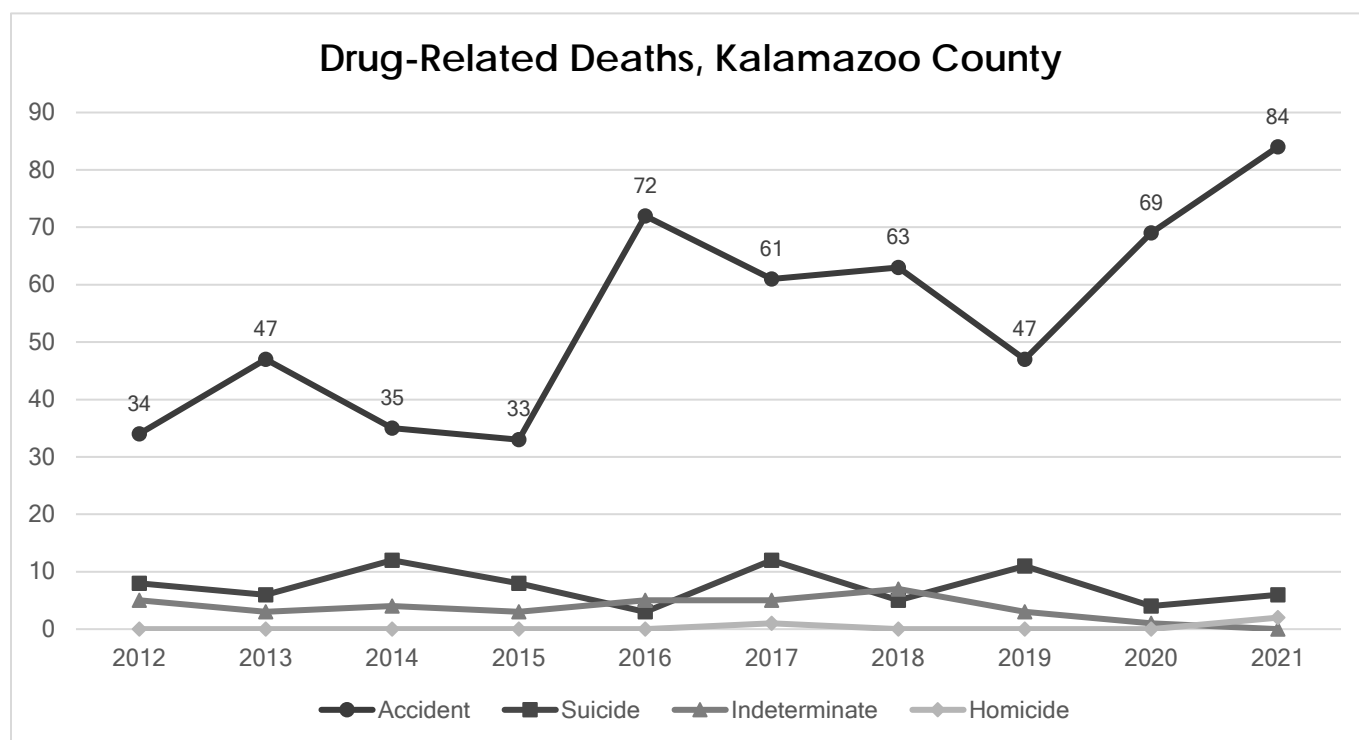
The 16 deaths of individuals under 18 years of age include:

1. <1 year old
 - a. (1) Sudden unexplained infant death associated with unsafe sleep and seizure disorder; indeterminate
 - b. (1) Sudden unexplained infant death associated with unsafe sleep and small for gestational age; indeterminate
 - c. (1) Sudden unexplained infant death associated with unsafe sleep and bronchiolitis of unknown etiology/significance; indeterminate
 - d. (1) Asphyxia due to overlay/wedging; accident
 - e. (1) Extreme prematurity and chromosomal abnormality; natural
2. 1-5 years old
 - a. (1) Blunt force injuries; homicide
 - b. (1) Complications of blunt force injuries; homicide
 - c. (1) Blunt force injuries, restrained passenger in rollover motor vehicle collision; accident
 - d. (1) Complications of asphyxiation due to upper airway obstruction by foreign object; accident
 - e. (1) Complications of tetralogy of Fallot; natural
3. 6-10 years old
 - a. (1) Gunshot wound of head; homicide
4. 11-17 years old
 - a. (1) Multiple injuries, intentionally drove motor vehicle into fixed object; suicide
 - b. (1) Craniocerebral trauma, bicyclist struck by motor vehicle; accident
 - c. (1) Gunshot wound of head; homicide
 - d. (1) Complications of cerebral palsy and extreme prematurity; natural
 - e. (1) Gunshot wound of chest; homicide

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, Kalamazoo County

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Vehicle	48	60	35	46	58	72	51	45	40	74
Drug-Related	34	47	35	33	72	61	63	47	69	84
Drowning	2	2	3	1	4	7	9	5	5	0
Fall	67	76	77	57	80	92	100	85	123	86 ¹
Fire	2	8	3	3	4	5	4	5	6	4
Environmental Exposure	4	1	1	1	1	2	3	5	5	2
Asphyxia	3	4	2	7	3	6	6	12	6	7 ²
Other	7	3	4	3	1	7	3	3	3	10 ³
Total	167	200	160	151	223	252	238⁴	207	257	267



¹ Includes (2) Blunt force injuries due to falling off of bicycle

² (1) Asphyxia due to overlay/wedging; (3) Asphyxia due to choking; (1) Positional asphyxia associated with seizure disorder; (1) Autoerotic asphyxia; (1) Traumatic asphyxia, pinned between cars

³ Includes (1) Blast injuries due to explosion (propane leak); (1) Inhalation of products of combustion associated with illicit drug use; (1) Multiple injuries due to vehicle rolling onto individual while working underneath; (1) Complications of blunt force head and neck injuries due to skiing accident; (1) Complications of adverse drug reaction; (1) Sepsis due to sharp force trauma inflicted unintentionally; (1) Complications of blunt force head trauma due to being struck by falling objects; (1) Multiple blunt force injuries, pinned beneath tractor; (1) Complications of colon perforation during colonoscopy; (1) Gunshot wound of chest

⁴ (1) death is categorized twice (drowning and vehicle-related; vehicle left roadway and entered water)

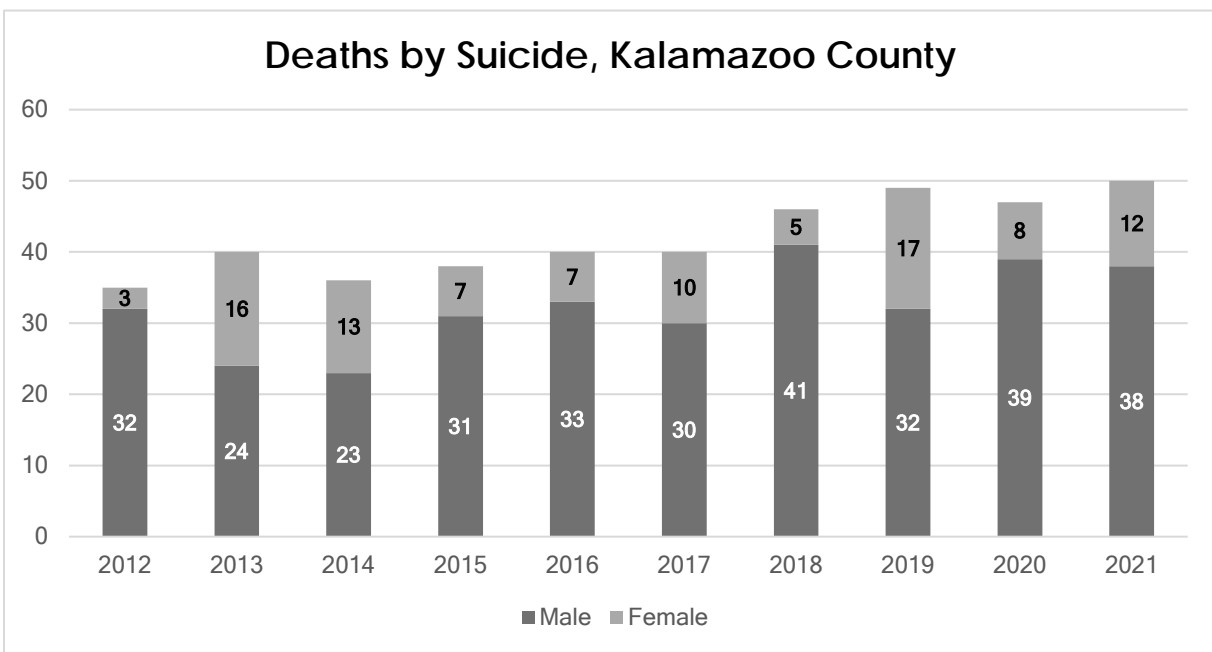
Drug-Related Deaths by Manner, Kalamazoo County¹

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Accident	34	47	35	33	72	61	63	47	69	84
Suicide	8	6	12	8	3	12	5	11	4	6
Homicide	0	0	0	0	0	1	0	0	0	0
Indeterminate	5	3	4	3	5	5	7	3	1	2
Total	47	56	51	44	80	79	75	61	74	92
Total involving opioid(s)	N/A	N/A	N/A	30	64	59	51	32	56	63
% of Accidents and Indeterminate Deaths Involving Opioids	N/A	N/A	N/A	83%	82%	74%	73%	60%	80%	69%

Suicides by Sex & Age, Kalamazoo County

Year	Total	Male	Female	0 - 17	18 - 25	26 - 44	45 - 64	65 +
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
2021	50	38	12	1	8	20	17	4

¹ Acute alcohol intoxications are defined as drug-related deaths and are included in this data



Suicides by Mechanism, Kalamazoo County

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Firearm	15	15	14	19	19	14	26	22	21	22
Hanging	8	13	7	9	13	12	13	12	21	17
Carbon Monoxide	1	0	0	1	2	0	0	0	1	0
Drug Intoxication	8	6	12	8	3	12	5	11	4	6
Motor Vehicle	0	1	1	1	0	0	0	2	0	2
Sharp Force Trauma	1	2	0	0	2	2	0	0	0	1
Asphyxia/Suffocation	1	3	1	0	0	0	1	1	0	0
Other	1	0	1	0	1	0	1	1	0	2 ¹
Total	35	40	36	38	40	40	46	49	47	50

¹ (2) Fire-related injuries due to self-immolation

LEELANAU COUNTY

Summary of All Leelanau County Cases

	2017	2018	2019	2020	2021
Total Deaths in the County	148	175	145	187 ¹	213 ²
Deaths Reported to the ME	39	46	33	45	61
Deaths Investigated	36	45	33	44	60
MEI Scene Investigations	24	41	28	31	43
Death Certificates by ME	21	15	13	11	24
Bodies Transported to WMed	10	9	8	7	12
Complete Autopsy	9	7	6	1	9
Limited Autopsy	1	0	0	0	0
External Examination	0	2	2	6	3
Storage Only	0	0	0	0	0
Total Cases with Toxicology	10	8	8	6	11
Unidentified Remains After Exam	0	0	0	0	0
Referrals to Gift of Life	6	8	6	7	14
Tissue Donations	0	1	1	1	1
Cornea Donations	0	0	0	0	0
Unclaimed Investigations	0	0	0	0	0
Exhumations	0	0	0	0	0

Cremation Permit Authorizations, Leelanau County

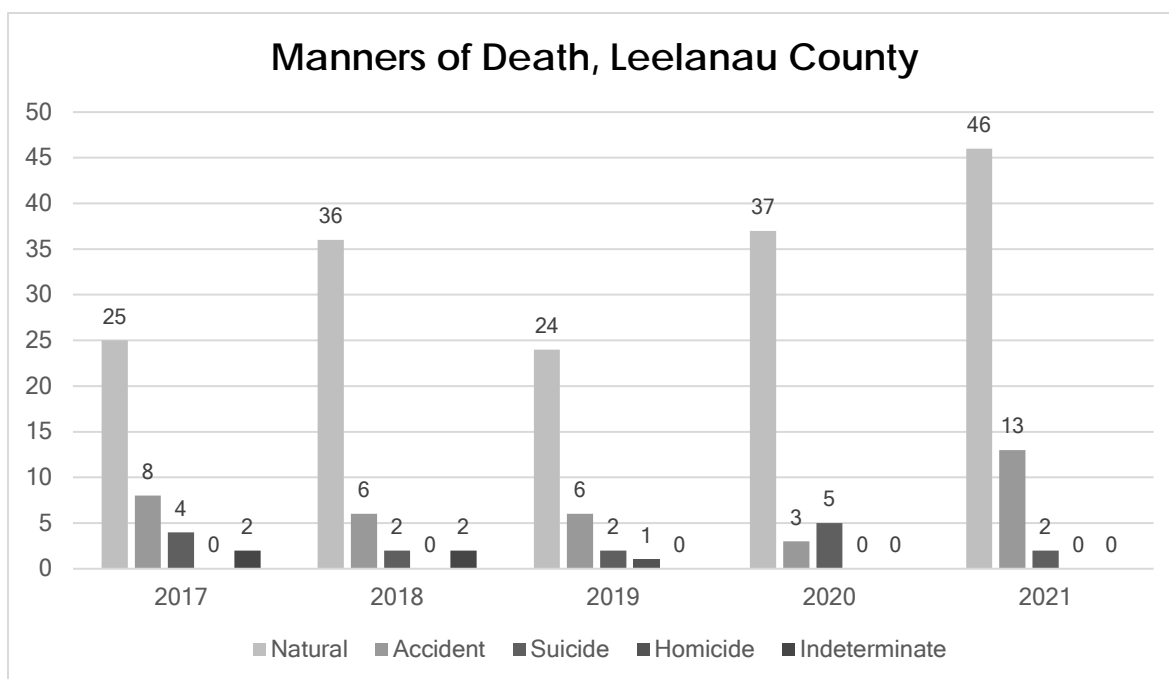
	2017	2018	2019	2020	2021
Cremation Permits	105	130	102	132	164
% of Total Deaths with Cremation	71%	74%	70%	71%	77%

¹ Updated total number of deaths occurring in the county

² Provisional total number of deaths occurring in the county

Manners of Death Reported, Leelanau County

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



Deaths Reported by Age (in years), Leelanau County¹

	< 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

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

Pediatric Deaths, Leelanau County

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

1. 1-5 years old
 - a. (1) Hyperthermia; accident
2. 11-17 years old
 - a. (1) Hanging; suicide

Accidental Deaths by Mechanism, Leelanau County

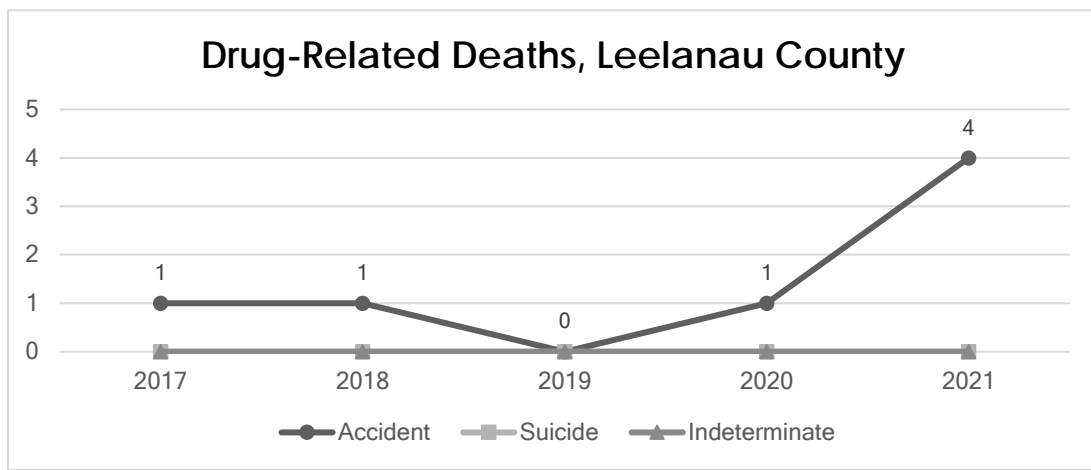
	2017	2018	2019	2020	2021
Vehicle	2	1	3	1	1
Drug-Related	1	1	0	1	4
Drowning	0	2	2	0	1
Fall	0	1	1	0	5
Fire	0	0	0	0	0
Environmental Exposure	0	0	0	0	1
Asphyxia	0	1	0	1	0
Other	1	0	0	0	1 ¹
Total	4	6	6	3	13

Drug-Related Deaths by Manner, Leelanau County²

	2017	2018	2019	2020	2021
Accident	1	1	0	1	4
Suicide	0	0	0	0	0
Indeterminate	0	0	0	0	0
Total	1	1	0	1	4
Total involving opioid(s)	1	0	0	1	3
% of Accidents and Indeterminate Manners Involving Opioids	100%	0%	0%	100%	75%

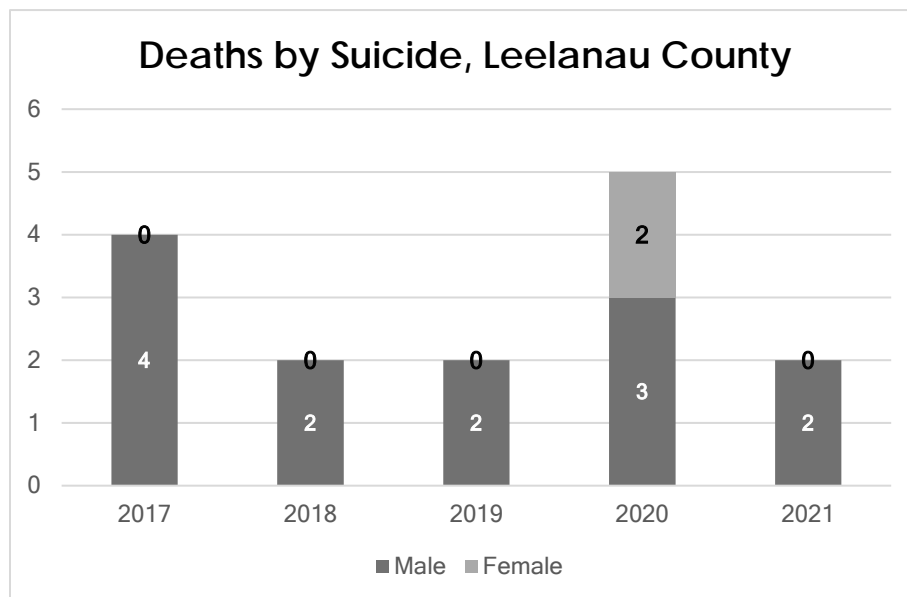
¹ (1) Electrocution

² Acute alcohol intoxications are defined as drug-related deaths and are included in this data



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
2021	2	2	0	1	0	1	0	0



Suicides by Mechanism, Leelanau County

	2017	2018	2019	2020	2021
Firearm	2	2	2	3	0
Hanging	1	0	0	2	2
Carbon Monoxide	0	0	0	0	0
Drug Intoxication	0	0	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	1	0	0	0	0
Total	4	2	2	5	2

MASON COUNTY

Summary of All Mason County Cases

	2018	2019	2020	2021
Total Deaths in the County	311	287	344 ¹	373 ²
Deaths Reported to the ME	107	110	111	139
Deaths Investigated	92	93	97	124
MEI Scene Investigations	88	84	83	111
Death Certificates by ME	53	52	34	44
Bodies Transported to WMed	37	34	22	32
Complete Autopsy	29	25	12	20
Limited Autopsy	0	0	3	1
External Examination	6	7	7	7
Storage Only	2	2	0	4
Total cases with Toxicology	32	31	21	28
Unidentified Remains After Exam	0	0	1	0
Referrals to Gift of Life	16	10	19	26
Tissue Donations	3	2	0	2
Cornea Donations	0	1	0	1
Unclaimed Investigations	1	0	0	6
Exhumations	0	0	0	0

Cremation Permit Authorizations, Mason County

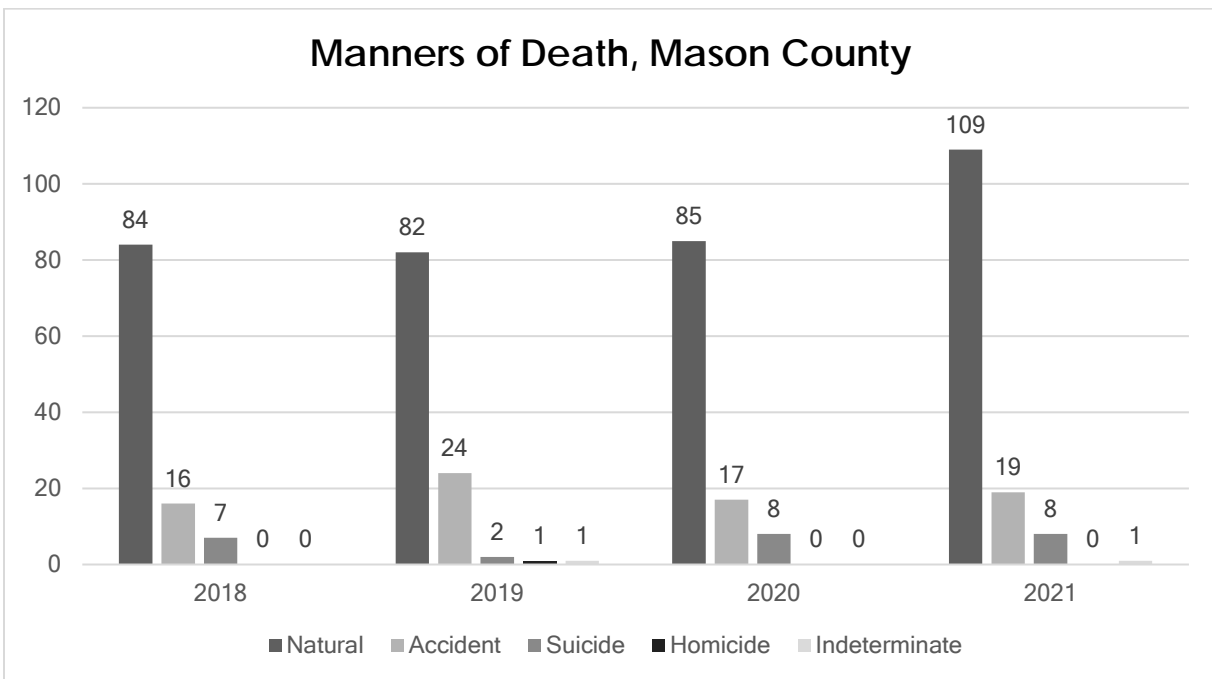
	2018	2019	2020	2021
Cremation Permits	231	224	288	300
% of Total Deaths with Cremation	74%	78%	84%	80%

¹ Updated total number of deaths occurring in the county

² Provisional total number of deaths occurring in the county

Manners of Death Reported, Mason County

	2018	2019	2020	2021
Natural	84	82	85	109
Accident	16	24	17	19
Suicide	7	2	8	8
Homicide	0	1	0	0
Indeterminate	0	1	0	1 ¹
Total	107	110	110	137²



Deaths Reported by Age (in years), Mason County³

	< 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

¹ (1) Inhalation of products of combustion, residential fire of unknown etiology

² Does not include (2) 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

Pediatric Deaths, Mason County

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

1. 11-17 years old
 - a. (1) Ligature injuries sustained in hanging attempt; suicide

Accidental Deaths by Mechanism, Mason County

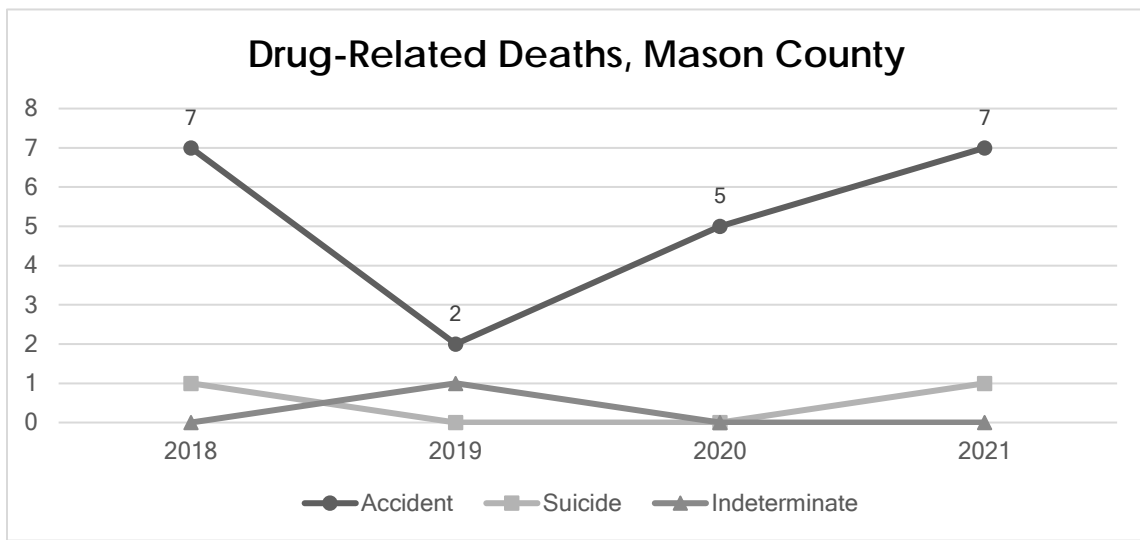
	2018	2019	2020	2021
Vehicle	5	6	4	5
Drug-Related	7	2	5	7
Drowning	1	7	2	2
Fall	3	6	4	4
Fire	0	0	0	0
Environmental Exposure	0	3	0	0
Asphyxia	0	0	1	1
Other	0	0	1	0
Total	16¹	24	17	19

Drug-Related Deaths by Manner, Mason County²

	2018	2019	2020	2021
Accident	7	2	5	7
Suicide	1	0	0	1
Indeterminate	0	1	0	0
Total	8	3	5	8
Total involving opioid(s)	4	1	5	7
% of Accidents and Indeterminate Deaths Involving Opioids	57%	33%	100%	100%

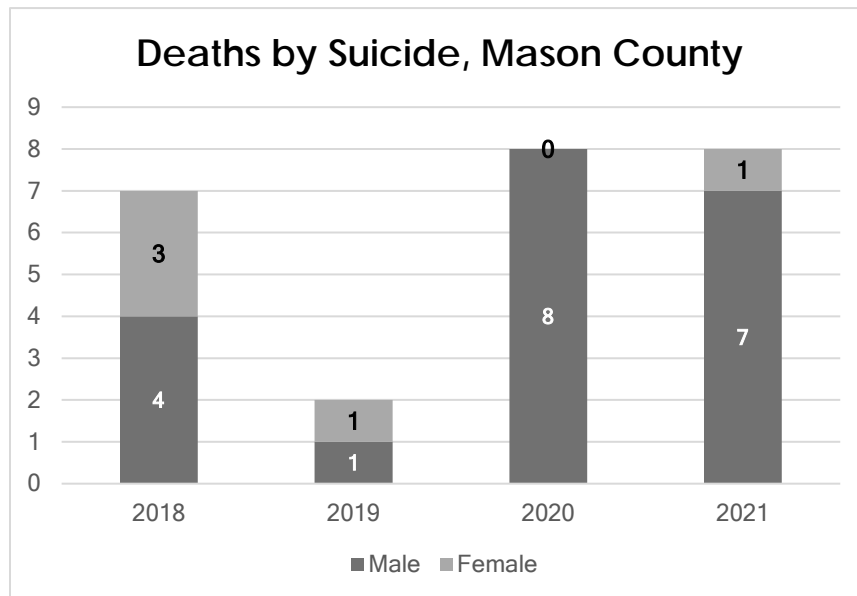
¹ (1) death is categorized twice (drug-related and environmental exposure)

² Acute alcohol intoxications are defined as drug-related deaths and are included in this data



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
2021	8	7	1	1	0	3	4	0



Suicides by Mechanism, Mason County

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

MUSKEGON COUNTY

Summary of All Muskegon County Cases

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total Deaths in the County	1,600	1,730	1,707	1,784	1,759	1,784	1,841	1,846	2,222 ¹	2,171 ²
Deaths Reported to the ME	481	527	524	605	585	629	662	670	804	842
Deaths Investigated	412	424	453	530	504	468	504	523	628	642
MEI Scene Investigations	384	420	444	501	469	425	463	467	538	537
Death Certificates by ME	203	216	228	251	231	234	235	248	255	292
Bodies Transported to WMed	132	148	178	159	167	159	161	177	167	191
Complete Autopsy	106	120	144	120	114	108	117	134	125	137
Limited Autopsy	2	6	2	4	2	4	4	5	4	4
External Examination	22	18	18	35	41	43	35	30	34	39
Storage Only	2	4	4	0	10	4	4	8	4	11
Total Cases with Toxicology	119	142	152	160	136	140	147	160	158	179
Unidentified Remains After Exam	0	0	0	0	0	0	0	0	0	1 ³
Referrals to Gift of Life	81	93	156	139	109	122	128	104	137	155
Tissue Donations	8	9	14	17	12	9	15	12	9	12
Cornea Donations	11	12	16	20	11	7	8	6	4	8
Unclaimed Investigations	4	3	6	5	7	12	15	14	19	20
Exhumations	0	0	0	0	0	0	0	0	0	2 ⁴

¹ Updated total number of deaths occurring in the county

² Provisional total number of deaths occurring in the county

³ (1) Unidentified human remains (exhumation for DNA analysis)

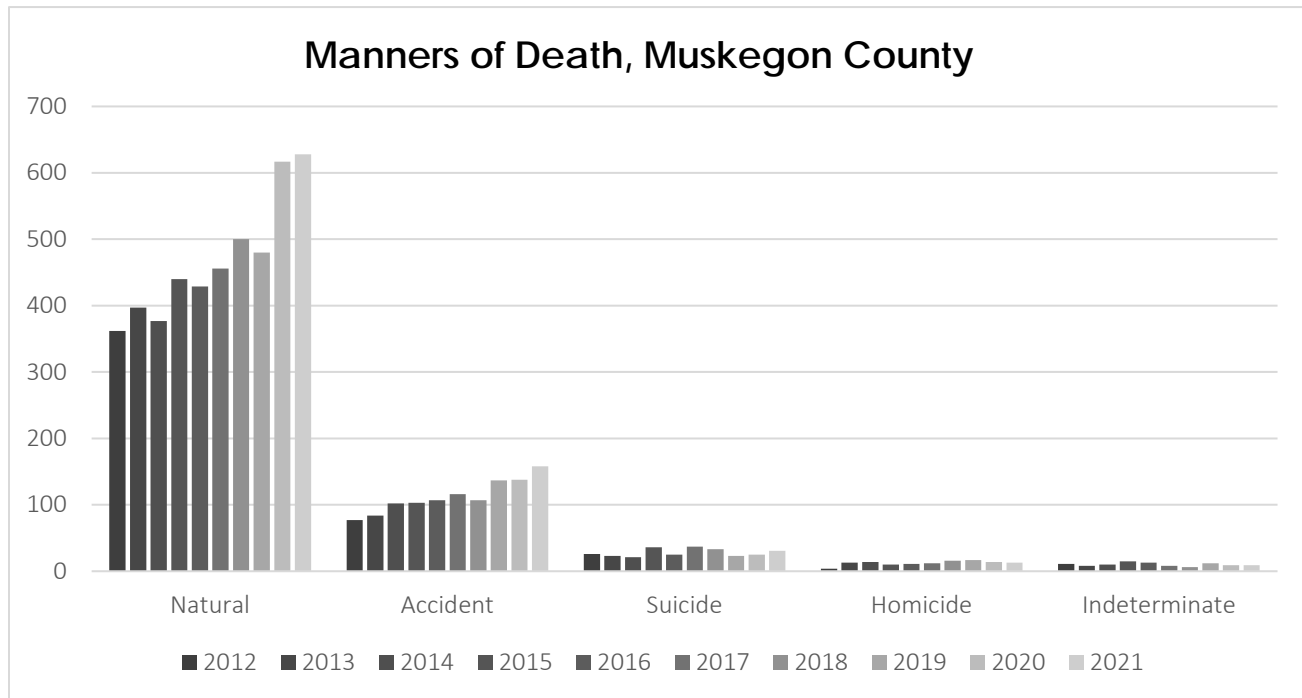
⁴ Includes (1) Family requested exhumation for reburial of remains elsewhere

Cremation Permit Authorizations, Muskegon County

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Cremation Permits	952	986	1,007	1,116	1,138	1,188	1,264	1,383	1,600	1,637
% of Total Deaths with Cremation	60%	57%	59%	63%	65%	67%	68%	75%	72%	75%

Manners of Death Reported, Muskegon County

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Natural	362	397	377 ¹	440	429	456	500	480	617	628
Accident	77	84	102	103	107	116	107	137	138	158
Suicide	26	23	21	36	25	37	33	23	25	31
Homicide	4	13	14	10	11	12	16	17	14	13
Indeterminate	11	8	10 ²	15	13	8	6	12	9	9 ³
Total	480	525	524	604	585	629	662	669	803	839⁴



¹ After careful review, this number was corrected from 375 to 377

² After careful review, this number was corrected from 9 to 10

³ (1) Epilepsy due to blunt head injury of uncertain etiology; (1) Acute and chronic head injury of uncertain etiology; (1) Inhalation of products of combustion, residential fire; (1) Inhalation of products of combustion and thermal injuries, residential fire; (3) Sudden unexplained infant death associated with unsafe sleep; (2) Sudden unexplained infant death associated with viral infection and unsafe sleep

⁴ Does not include (1) Unidentified human remains (exhumation for DNA analysis); (2) Stillbirth investigations

Deaths Reported by Age (in years), Muskegon County¹

	< 1	1 - 5	6 - 10	11 - 17	18 - 25	26 - 44	45 - 64	65 +
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
2021 ²	5	0	0	1	20	92	236	485

Pediatric Deaths, Muskegon County

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

1. <1 year old
 - a. (3) Sudden unexplained infant death associated with unsafe sleep; indeterminate
 - b. (2) Sudden unexplained infant death associated with viral infection and unsafe sleep; indeterminate
2. 11-17 years old
 - a. (1) Complications of microcephaly; natural

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

² Does not include (1) Unidentified human remains (exhumation for DNA analysis)

Accidental Deaths by Mechanism, Muskegon County

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Vehicle	18	13	18	22	22	22	21	33	27	28
Drug-Related	20	37	47	39	40	47	40	46	57	59
Drowning	4	4	4	4	2	4	2	5	4	6 ¹
Fall	27	26	29	29	32	38	37	43	38	51
Fire	0	0	1	3	1	0	0	1	3	1
Environmental Exposure	0	0	1	1	4	0	1	2	4	7 ²
Asphyxia	4	2	2	3	4	2	5	4	4	3 ³
Other	3	0	1	2	2	3	2	3	1	3 ⁴
Total	76	82	103	103	107	116	107⁵	137	138	158

Drug-Related Deaths by Manner, Muskegon County⁶

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Accident	20	37	47	39	39	47	40	46	57	59
Suicide	5	1	2	7	3	4	10	4	3	5
Indeterminate	2	2	5	4	6	3	1	5	0	0
Total	27	40	54	50	48	54	51	55	60	64
Total involving opioid(s)	N/A	N/A	N/A	43	41	43	39	43	50	54
% of Accidents and Indeterminate Deaths Involving Opioids	N/A	N/A	N/A	95%	87%	84%	85%	84%	88%	88%

¹ Includes (1) Drowning associated with mixed drug intoxication

² Includes (2) Natural disease associated with probable hypothermia; (1) Hypothermia associated with acute drug intoxication and natural disease; (1) Hypothermia associated with acute and chronic alcohol use and natural disease

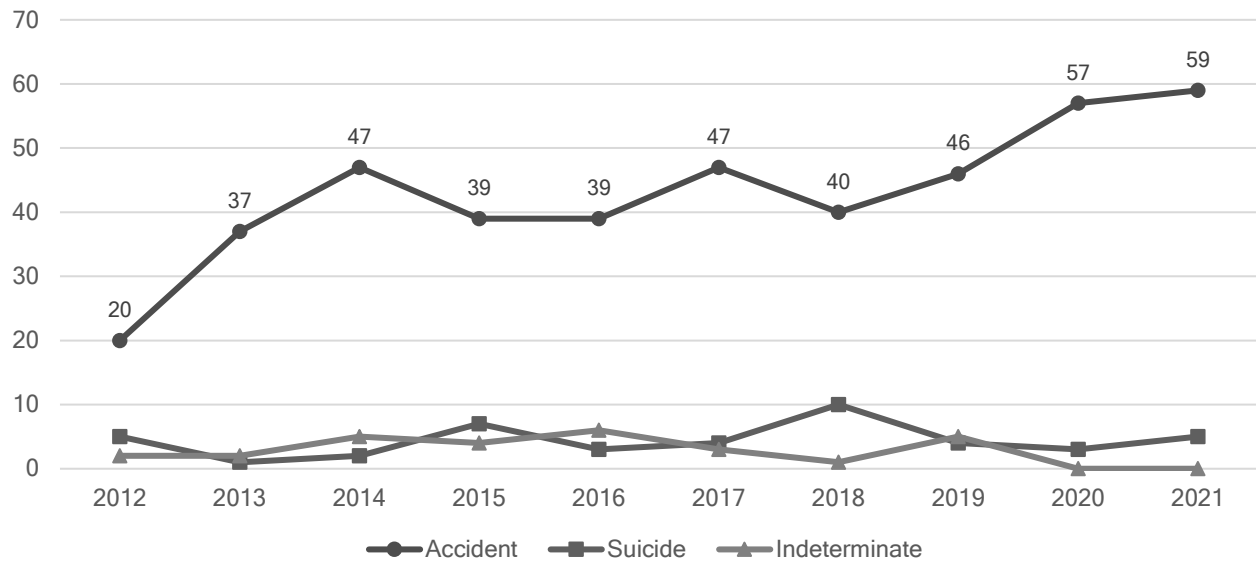
³ (3) Asphyxia due to choking

⁴ (2) Carbon monoxide poisoning; (1) Natural disease associated with multiple blunt and sharp force injuries (dog bites)

⁵ (1) Death is categorized twice (drug-related and drowning)

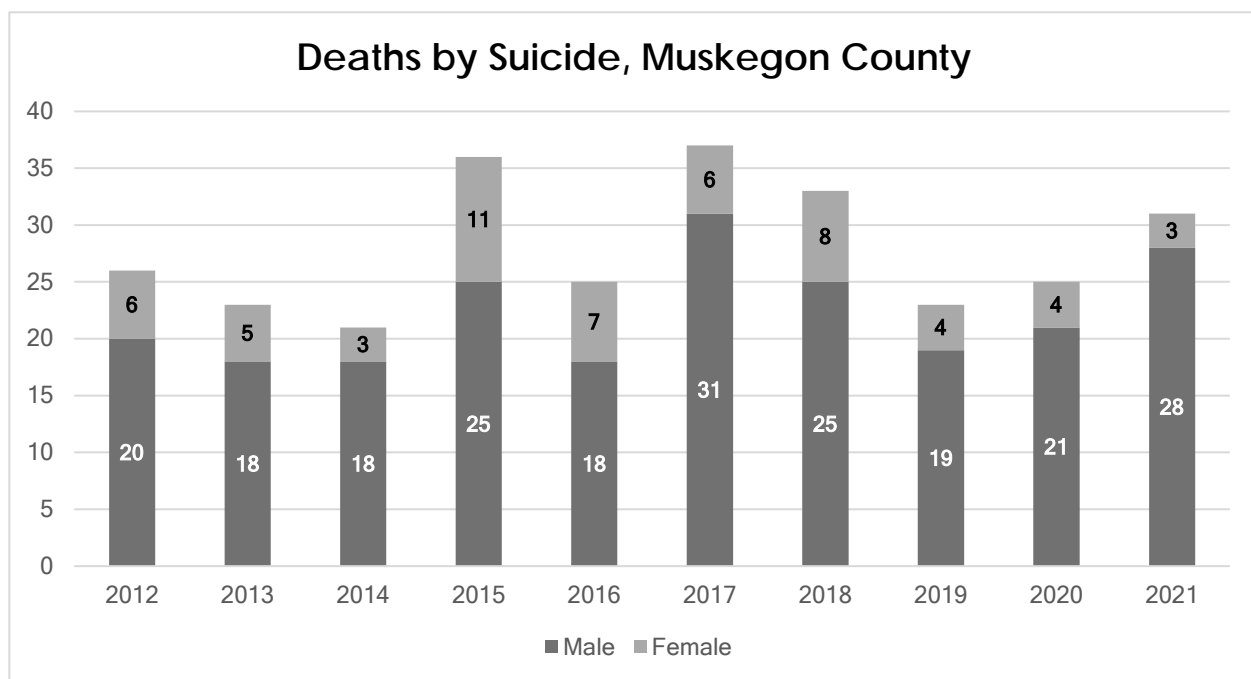
⁶ Acute alcohol intoxications are defined as drug-related deaths and are included in this data

Drug-Related Deaths, Muskegon County



Suicides by Sex & Age, Muskegon County

Year	Total	Male	Female	0 - 17	18 - 25	26 - 44	45 - 64	65 +
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
2021	31	28	3	0	3	12	10	6



Suicides by Mechanism, Muskegon County

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Firearm	13	9	10	11	15	19	14	13	8	10
Hanging	7	7	7	15	5	10	9	5	9	9
Carbon Monoxide	0	1	0	1	1	1	0	0	1	2
Drug Intoxication	5	1	3	7	2	4	7	4	3	5
Motor Vehicle	0	2	1	0 ¹	0	0	0	0	0	0
Sharp Force Trauma	0	3	0	2	1	0	0	1	0	1
Asphyxia/Suffocation	1	0	0	0	1	1	0	0	2	1 ²
Other	0	0	0	0	0	2	3	0	2	3 ³
Total	26	23	21	36	25	37	33	23	25	31

¹ After careful review, this number was corrected from 2 to 0

² (1) Self-inflicted strangulation with cord

³ (1) Drowning; (1) Drowning associated with mixed drug intoxication; (1) Intentionally induced diabetic ketoacidosis

OSCEOLA COUNTY

Summary of Osceola County Cases

	2018 ¹	2019	2020	2021
Total Deaths in the County	187	175	211 ²	153 ³
Deaths Reported to the ME	62	72	78	60
Deaths Investigated	58	63	72	54
MEI Scene Investigations	55	62	66	47
Death Certificates by ME	31	29	32	14
Bodies Transported to WMed	17	23	22	12
Complete Autopsy	12	12	13	10
Limited Autopsy	0	2	1	0
External Examination	4	7	8	2
Storage Only	1	2	0	0
Total Cases with Toxicology	16	20	21	12
Unidentified Remains After Exam	1	1	0	0
Referrals to Gift of Life	10	16	16	14
Tissue Donations	1	1	1	0
Cornea Donations	1	1	1	1
Unclaimed Investigations	0	1	2	0
Exhumations	0	0	0	0

Cremation Permit Authorizations, Osceola County

	2018 ⁴	2019	2020	2021
Cremation Permits	86	128	151	113
% of Total Deaths with Cremation	46%	73%	72%	74%

¹ 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

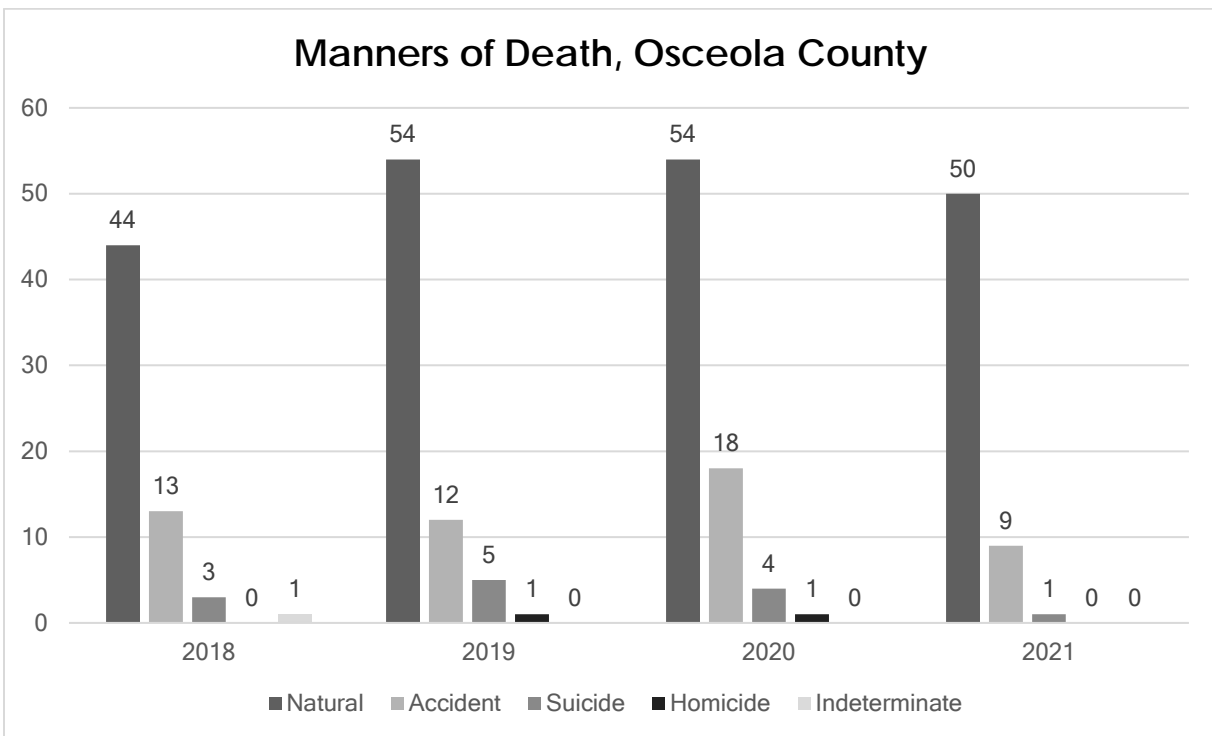
² Updated total number of deaths occurring in the county

³ Provisional total number of deaths occurring in the county

⁴ Data includes only those cremation permits reviewed and approved at WMed

Manners of Death Reported, Osceola County

	2018	2019	2020	2021
Natural	44	54	54	50
Accident	13	12	18	9
Suicide	3	5	4	1
Homicide	0	1	1	0
Indeterminate	1	0	0	0
Total	61	72	77	60



Deaths Reported by Age (in years), Osceola County¹

	< 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
2021	0	0	0	0	0	5	20	35

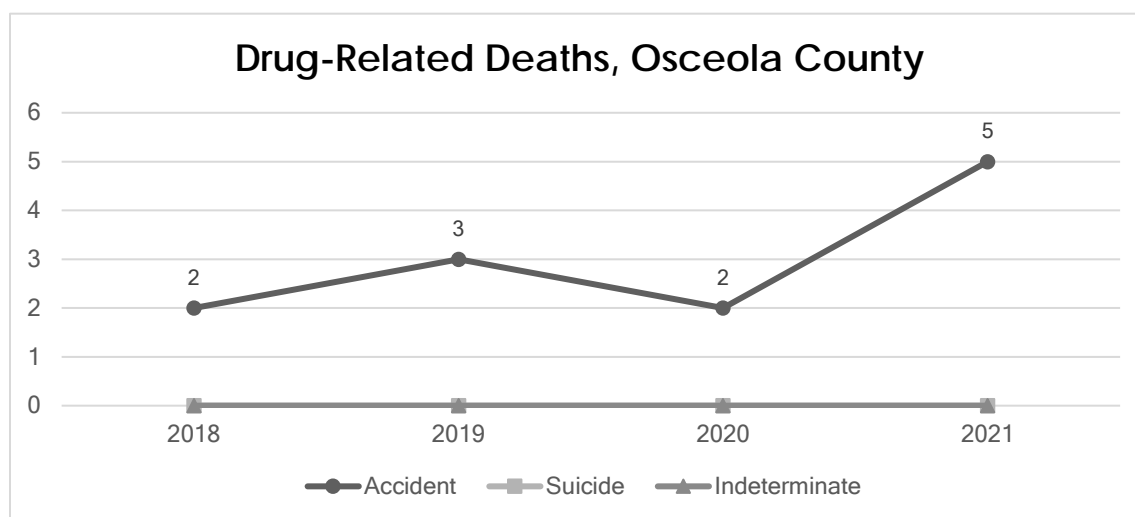
¹ All stillbirths and spontaneous abortions (miscarriages) investigated but not requiring an examination have been removed from this table for a more accurate representation of deaths reported under the age of one year

Accidental Deaths by Mechanism, Osceola County

	2018	2019	2020	2021
Vehicle	4	6	11	1
Drug-Related	2	3	2	5
Drowning	0	2	0	1
Fall	3	0	4	0
Fire	0	0	0	0
Environmental Exposure	0	0	1	2 ¹
Asphyxia	2	1	0	0
Other	2	0	0	0
Total	13	12	18	9

Drug-Related Deaths by Manner, Osceola County²

	2018	2019	2020	2021
Accident	2	3	2	5
Suicide	0	0	0	0
Indeterminate	0	0	0	0
Total	2	3	2	5
Total involving opioid(s)	1	2	0	4
% of Accidents and Indeterminate Deaths Involving Opioids	50%	66%	0%	80%

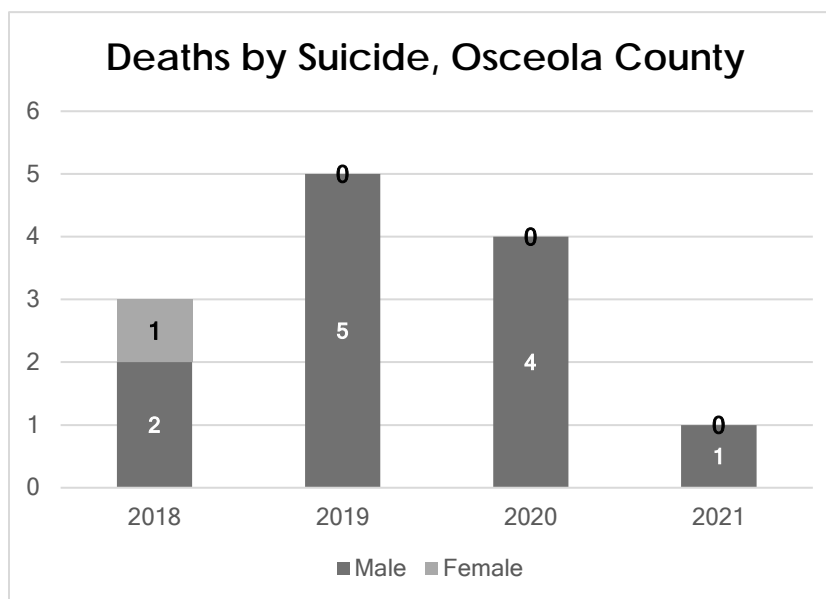


¹ Includes (1) Probable hypothermia

² Acute alcohol intoxications are defined as drug-related deaths and are included in this data

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
2021	1	1	0	0	0	1	0	0



Suicides by Mechanism, Osceola County

	2018	2019	2020	2021
Firearm	2	4	3	1
Hanging	1	1	1	0
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	0	0	0	0
Total	3	5	4	1

ST. JOSEPH COUNTY

Summary of St. Joseph County Cases

	2017	2018	2019	2020	2021
Total Deaths in the County	508	530	507	541 ¹	601 ²
Deaths Reported to the ME	164	157	150	200	220
Deaths Investigated	155	150	145	196	191
MEI Scene Investigations	147	141	134	172	173
Death Certificates by ME	66	69	70	74	73
Bodies Transported to WMed	56	67	61	64	54
Complete Autopsy	34	39	34	42	30
Limited Autopsy	1	2	3	4	1
External Examination	14	20	17	11	16
Storage Only	7	5	7	7	7
Total Cases with Toxicology	43	55	51	54	45
Unidentified Remains After Exam	2	0	1	0	0
Referrals to Gift of Life	53	45	41	71	70
Tissue Donations	7	6	6	4	7
Cornea Donations	2	3	4	1	5
Unclaimed Investigations	1	4	8	6	4
Exhumations	0	0	0	0	0

Cremation Permit Authorizations, St. Joseph County

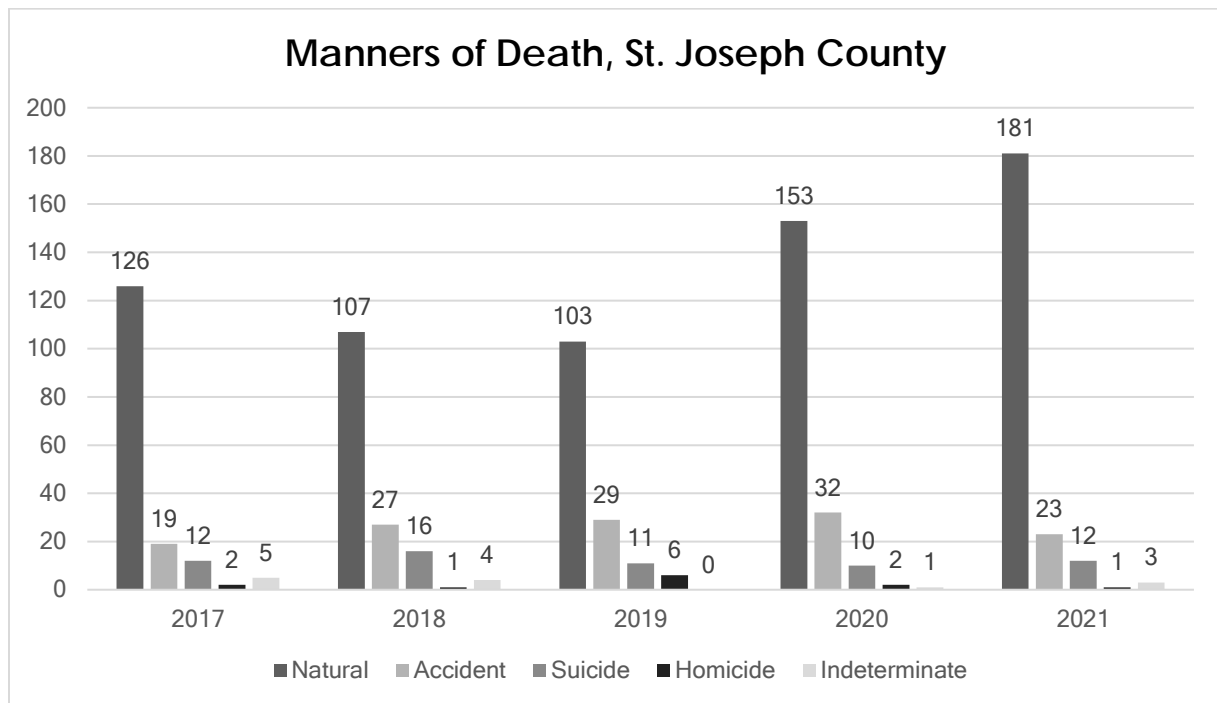
	2017	2018	2019	2020	2021
Cremation Permits	309	306	327	386	424
% of Total Deaths with Cremation	61%	58%	65%	71%	71%

¹ Updated total number of deaths occurring in the county

² Provisional total number of deaths occurring in the county

Manners of Death Reported, St. Joseph County

	2017	2018	2019	2020	2021
Natural	126	107	103	153	181
Accident	19	27	29	32	23
Suicide	12	16	11	10	12
Homicide	2	1	6	2	1
Indeterminate	5	4	0	1	3 ¹
Total	164	155	149	198	220



Deaths Reported by Age (in years), St. Joseph County²

	< 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

¹ (1) Mixed drug intoxication associated with hypothermia; (1) Sudden unexplained infant death associated with unsafe sleep and interstitial pneumonitis; (1) Sepsis of unknown etiology associated with illicit drug use

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

Pediatric Deaths, St. Joseph County

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

1. <1 year old
 - a. (1) Sudden unexplained infant death associated with unsafe sleep and interstitial pneumonitis; indeterminate
2. 11-17 years old
 - a. (1) Asphyxia due to suffocation; suicide

Accidental Deaths by Mechanism, St. Joseph County

	2017	2018	2019	2020	2021
Vehicle	8	15	11	13	6
Drug-Related	6	4	10	11	6
Drowning	2	1	3	2	3
Fall	1	3	4	3	5 ¹
Fire	1	4	0	2	0
Environmental Exposure	0	0	1	0	0
Asphyxia	1	1	0	1	1 ²
Other	0	0	0	0	2 ³
Total	19	27⁴	29	32	23

Drug-Related Deaths by Manner, St. Joseph County⁵

	2017	2018	2019	2020	2021
Accident	6	4	10	11	6
Suicide	0	2	1	1	2 ⁶
Indeterminate	1	0	0	0	2 ⁷
Total	7	6	11	12	10
Total involving opioid(s)	6	4	4	11	7
% of Accidents and Indeterminate Deaths Involving Opioids	86%	75%	40%	91%	88%

¹ Includes (1) Multiple blunt force injuries due to tree branch falling on decedent in elevated bucket and subsequent fall from height

² (1) Positional asphyxia (compression between two semi-truck trailers)

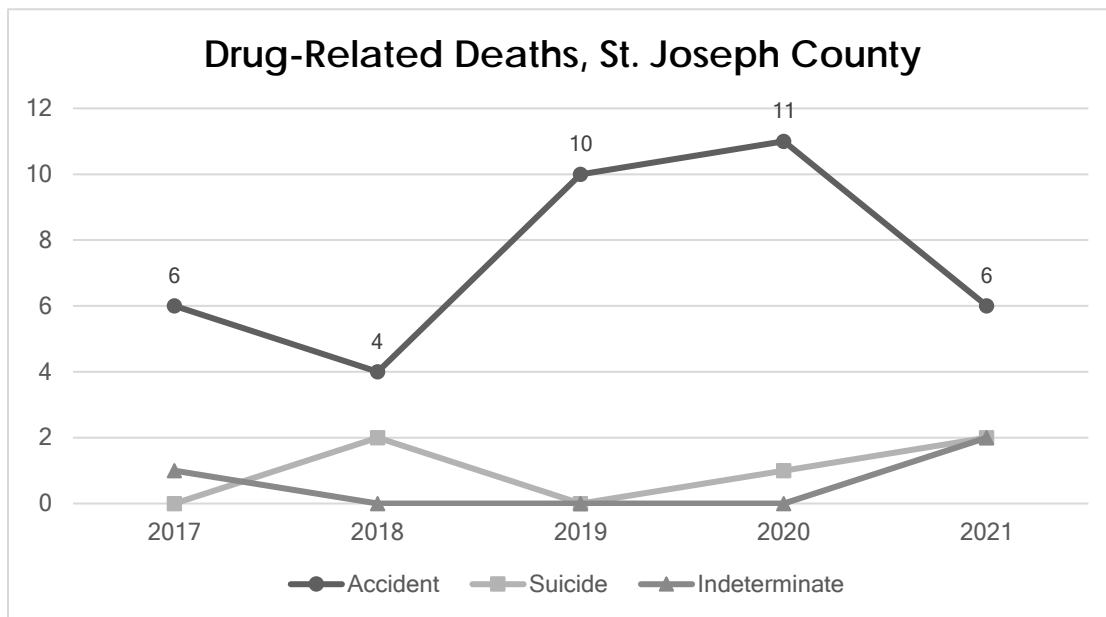
³ (2) Carbon monoxide intoxication

⁴ (1) Death is categorized twice (drowning and vehicle-related)

⁵ Acute alcohol intoxications are defined as drug-related deaths and are included in this data

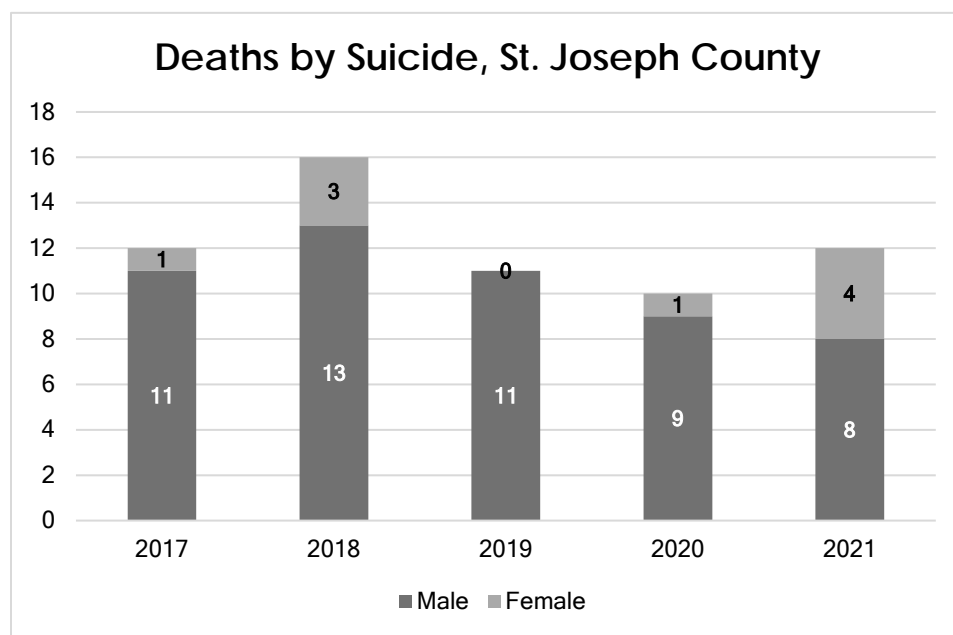
⁶ Includes (1) Intentional ingestion of toxic chemical (antifreeze)

⁷ (1) Mixed drug intoxication associated with hypothermia; (1) Sepsis of unknown etiology associated with illicit drug use



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
2021	12	8	4	1	1	4	5	1



Suicides by Mechanism, St. Joseph County

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

¹ Includes (1) Intentional ingestion of toxic chemical (antifreeze)

² (1) Suffocation via plastic bag

VAN BUREN COUNTY

Summary of Van Buren County Cases

	2018	2019	2020	2021
Total Deaths in the County	514	496	605 ¹	609 ²
Deaths Reported to the ME	162	180	220	241
Deaths Investigated	146	164	203	229
MEI Scene Investigations	142	158	188	217
Death Certificates by ME	61	74	89	96
Bodies Transported to WMed	56	62	62	86
Complete Autopsy	31	40	37	54
Limited Autopsy	2	2	1	0
External Examination	20	15	17	18
Storage Only	3	5	6	14 ³
Total Cases with Toxicology	44	53	52	69
Unidentified Remains After Exam	0	0	0	1 ⁴
Referrals to Gift of Life	55	45	39	95
Tissue Donations	8	1	2	7
Cornea Donations	3	1	2	1
Unclaimed Investigations	2	3	4	9
Exhumations	1	0	0	0

Cremation Permit Authorizations, Van Buren County

	2018	2019	2020	2021
Cremation Permits	322	327	420	439
% of Total Deaths with Cremation	63%	67%	70%	72%

¹ Updated total number of deaths occurring in the county

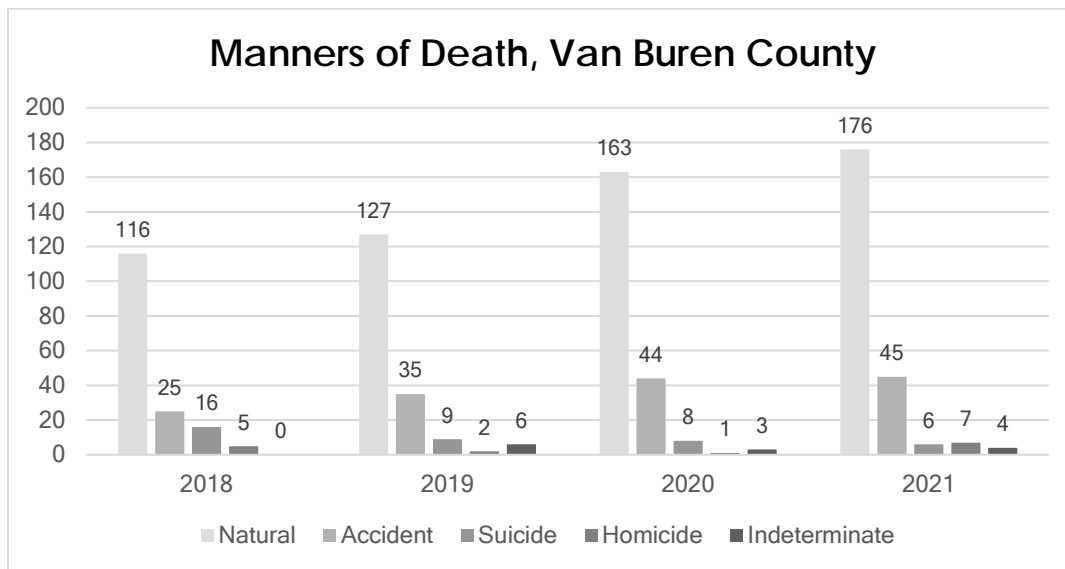
² Provisional total number of deaths occurring in the county

³ Includes (1) Human remains (associated with a multi-vehicle accident involving multiple decedents and subsequently re-associated with appropriate individual)

⁴ (1) Skeletonized human remains (historical) located at excavation site, repatriated

Manners of Death Reported, Van Buren County

	2018	2019	2020	2021
Natural	116	127	163	176
Accident	25	35	44	45
Suicide	16	9	8	6
Homicide	5	2	1	7
Indeterminate	0	6	3	4 ¹
Total	162	179	219	238²



Deaths Reported by Age (in years), Van Buren County³

	< 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

¹ (1) Gunshot wound of chest; (1) Mixed drug intoxication; (1) Thermal and inhalation injuries, residential fire; (1) Partially skeletonized remains, cause and manner of death cannot be determined

² Does not include (1) Non-human remains; (1) Unidentified skeletal remains (historical); (1) Human remains (associated with a multi-vehicle accident involving multiple decedents and subsequently re-associated with appropriate individual)

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, Van Buren County

	2018	2019	2020	2021
Vehicle	8	9	11	14
Drug-Related	10	15	17	19 ¹
Drowning	1	2	4	2
Fall	4	5	11	7
Fire	0	0	0	1
Environmental Exposure	1	2	0	1
Asphyxia	1	1	1	1 ²
Other	0	1	0	0
Total	25	35	44	45

Drug-Related Deaths by Manner, Van Buren County³

	2018	2019	2020	2021
Accident	10	15	17	19
Suicide	1	1	1	1 ⁴
Indeterminate	0	0	0	1
Homicide	0	0	0	1 ⁵
Total	11	16	18	22
Total involving opioid(s)	9	12	11	14
% of Accidents and Indeterminate Deaths Involving Opioids	90%	80%	59%	70%

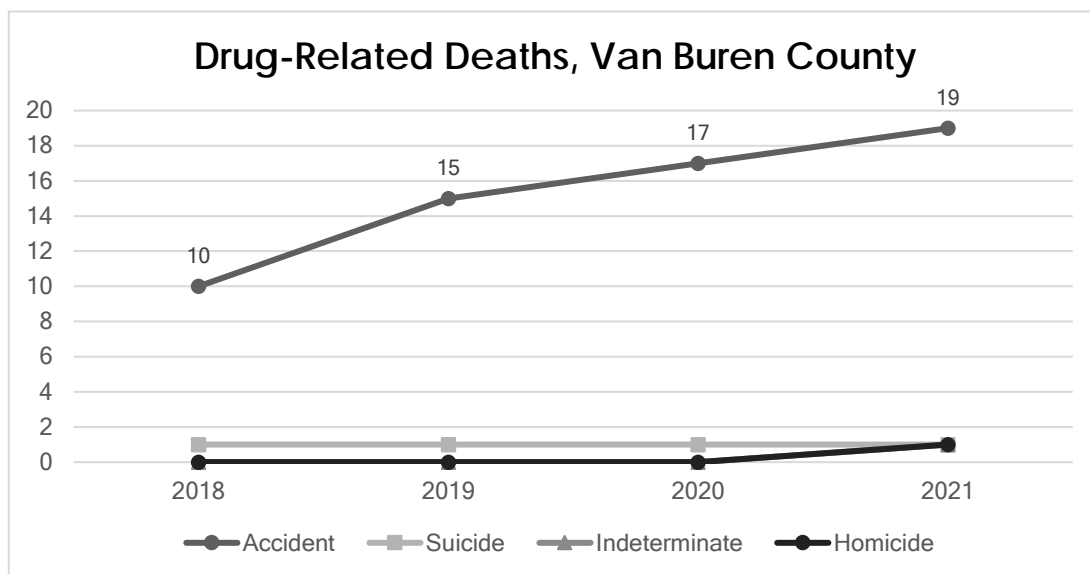
¹ Includes (1) Mixed drug intoxication associated with possible hypothermia

² (1) Asphyxia due to choking

³ Acute alcohol intoxications are defined as drug-related deaths and are included in this data

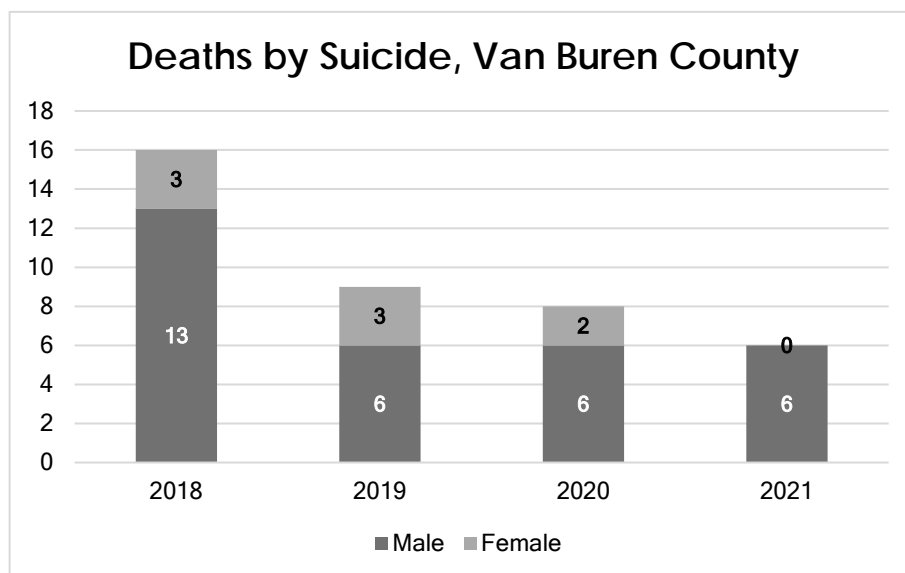
⁴ (1) Mixed drug intoxication, including toxic chemical ingestion (sodium nitrate)

⁵ (1) Intentional excess administration of medication by another



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
2021	6	6	0	0	1	1	4	0



Suicides by Mechanism, Van Buren County

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

¹ (1) Mixed drug intoxication, including toxic chemical ingestion (sodium nitrate)

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. Since 2016, the Division of Neuropathology at WMed has partnered with the Lieber Institute for Brain Development 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

Forensic Anthropology

Forensic Anthropology services are provided to all WMed Medical Examiner counties led by 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 assist in the coordination of all scientific identifications performed via fingerprint or DNA analysis. As necessary, they also contribute to the determination of identification via multiple corresponding factors.

	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

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 (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 ¹	310	333

Referrals to organ procurement organization (Gift of Life Michigan), 2021

	Referrals to Gift of Life	Tissue Donations	Cornea Donations
Allegan	103	8	2
Barry	54	6	4
Berrien	156	7	4
Calhoun	135	9	10
Cass	56	4	2
Grand Traverse	75	4	0
Kalamazoo	226	19	12
Leelanau	14	1	0
Mason	26	2	1
Muskegon	155	12	8
Osceola	14	0	1
St. Joseph	70	7	5
Van Buren	95	7	1
Total	1179	86	50

¹ Includes (2) neuropathology only examinations

Comparison of All Medical Examiner Counties, 2021

	Total Population ¹	Total Sq. Miles	Deaths in the County ²	Deaths Reported	Deaths Investigated	MEI Scene Investigations	DCs by ME	Cremation Permits	% Cremated	Unclaimed Investigations
Allegan	120,502	1,833	958	279	264	228	108	644	67%	10
Barry	62,423	577	529	155	143	135	53	354	67%	2
Berrien	154,316	1,581	1,913	604	548	484	215	1,219	64%	17
Calhoun	134,310	718	1,796	582	534	444	244	1,224	68%	32
Cass ³	51,589	508	419	147	143	140	66	262	63%	4
Grand Traverse	95,238	601	1,780	579	396	246	159	1,426	80%	13
Kalamazoo	261,670	580	3,580	1,283	1,002	821	496	1,594	72%	51
Leelanau	22,301	2,532	213	61	60	43	24	164	77%	0
Mason	29,052	1,242	373	139	124	111	44	300	80%	6
Muskegon	175,824	1,459	2,171	842	642	537	292	1,637	75%	20
Osceola	22,891	573	153	60	54	47	14	113	74%	0
St. Joseph	60,939	521	601	220	191	173	73	424	71%	4
Van Buren	75,587	1,090	609	241	229	217	96	439	72%	9
2021 Total	1,266,642	13,815	15,095	5,192	4,330	3,626	1,884	9,800	65%	168
2020 Total ⁴	1,209,917	13,307	14,197	4,848	4,029	3,328	1,675	10,099	71% ⁵	163

For all counties, about 34% of deaths are reported; jurisdiction is accepted, and deaths are investigated in about 29% of the deaths in the counties. Complete autopsies are conducted in nearly 6% of all deaths within the county and in about 17% 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 23% of deaths reported.

¹ Total county populations based on 2020 estimates by the US Census Bureau

² Provisional number of deaths occurring in each county

³ Data provided includes February 1 to December 31, 2021

⁴ Note: 2020 data does not include Cass County, as we took over as the MEO in February 2021

⁵ Average percentage cremated

Forensic Postmortem Examinations, 2021

	Complete Autopsies	% Complete Autopsies ¹	Limited Exams	External Exams	Total Postmortem Exams	% Postmortem Exams ²	Cardiovascular Consults
Allegan	51	5.3%	3	19	73	7.6%	0
Barry	23	4.3%	1	13	37	7.0%	0
Berrien	116	6.1%	3	26	145	7.6%	2
Calhoun	112	6.2%	3	45	160	8.9%	0
Cass	28	6.7%	1	13	42	10.0%	0
Grand Traverse	60	3.4%	2	17	79	4.4%	0
Kalamazoo	222	6.2%	5	82	309	8.6%	1
Leelanau	9	4.2%	0	3	12	5.6%	0
Mason	20	5.4%	1	7	28	7.5%	0
Muskegon	137	6.3%	4	39	180	8.3%	1
Osceola	10	6.5%	0	2	12	7.8%	0
St. Joseph	30	5.0%	1	16	47	7.8%	0
Van Buren	54	8.9%	0	18	72	11.8%	1
Consultant Counties	310	---	0	0	310	---	2
2021 Total	1,182	5.8%³	24	300	1,506	7.9%⁴	7
2020 Total ⁵	959	5.4% ³	40	239	1,238	7.3% ⁴	3

¹ Percent of all deaths in county with complete autopsies

² Percent of all deaths in county with a postmortem examination

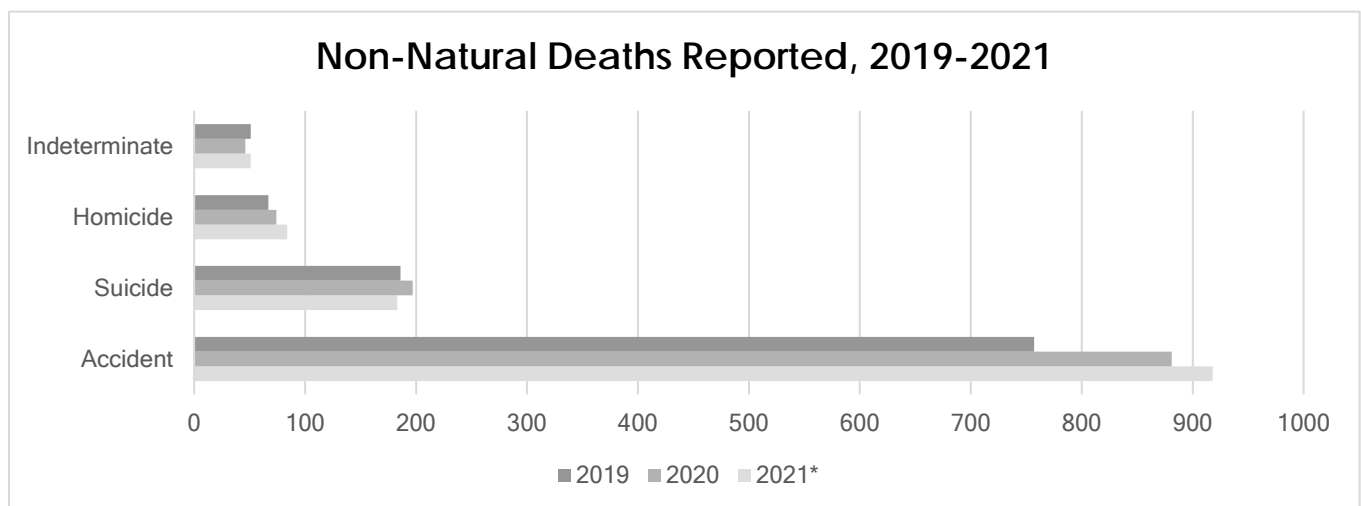
³ Average percentage of all deaths in county with complete autopsies

⁴ Average percentage of all deaths in county with a postmortem examination

⁵ Note: 2020 data does not include Cass County, as we took over as the MEO in February 2021

Manners of Death, All Medical Examiner Counties, 2021

	Natural	Accident	Suicide	Homicide	Indeterminate	2021 Total
Allegan	207	51	16	2	3	279
Barry	120	18	10	4	2	154
Berrien	458	105	10	13	12	598 ¹
Calhoun	442	112	18	7	3	582
Cass	105	30	7	3	1	146
Grand Traverse	450	98	19	2	2	571
Kalamazoo	906	267	50	35	12	1,270 ²
Leelanau	46	13	2	0	0	61
Mason	109	19	8	0	1	137
Muskegon	628	158	31	13	9	839
Osceola	50	9	1	0	0	60
St. Joseph	181	23	12	1	3	220
Van Buren	176	45	6	7	4	238
2021 Total	3,878	948	190	87	52	5,155
% of 2021 Total ³	74.7%	18.3%	3.7%	1.7%	1.0%	---
2020 Total ⁴	3,606	881	197	74	46	4,804



*2021 data does not include Cass County for a more accurate comparison

¹ Does not include (2) Pending cause and manner at the time of this report

² Does not include (2) Pending cause and manner at the time of this report

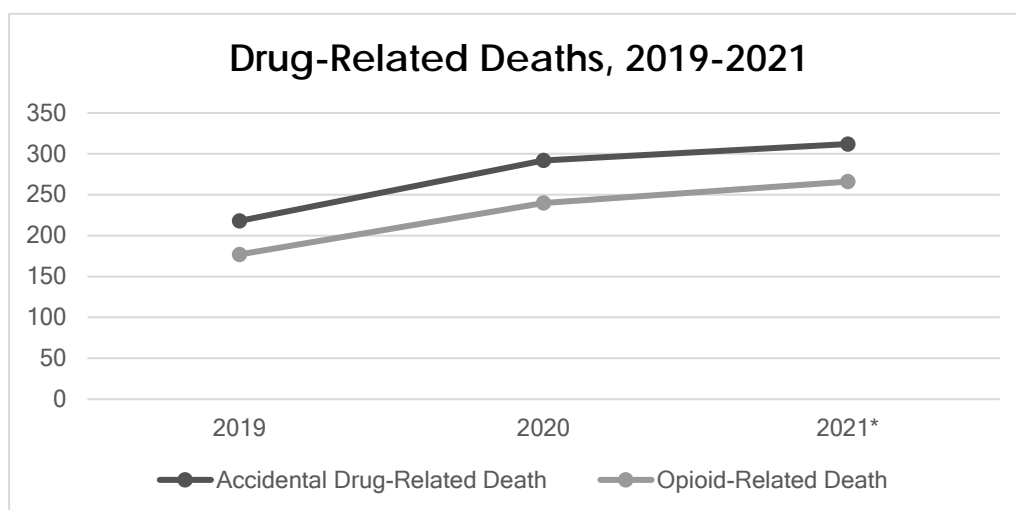
³ Percent of all deaths reported to our office; this will not add up to exactly 100% due to deaths reported to our office that do not require a manner of death (e.g., stillbirth investigations)

⁴ Note: 2020 data does not include Cass County, as we took over as the MEO in February 2021

Significant Death Statistics, 2021

	Accidental Drug-Related Deaths	Indeterminate Drug-Related Deaths	Opioid-Related Deaths	Accidental Traffic-Related Deaths	Accidental Fall-Related Deaths
Allegan	13	0	9	8	21
Barry	4	0	4	4	7
Berrien	36	1	28	24	34
Calhoun	59	0	49	17	28
Cass	7	1	8	17	1
Grand Traverse	16	0	16	23	46
Kalamazoo	84	2	63	74	86
Leelanau	4	0	3	1	5
Mason	7	0	7	5	4
Muskegon	59	0	54	28	51
Osceola	5	0	4	1	0
St. Joseph	6	2	7	6	5
Van Buren	19	1	14	14	7
2021 Total	319	7	266	222	295
2020 Total ¹	292	5	240	185	289

Although the Office of the Medical Examiner at WMed did not provide services to Cass County before February of 2021, each of these categories still increased from 2020 to 2021. As the number of accidental drug-related deaths has increased, the number of opioid-related deaths (of all manners) has also increased.



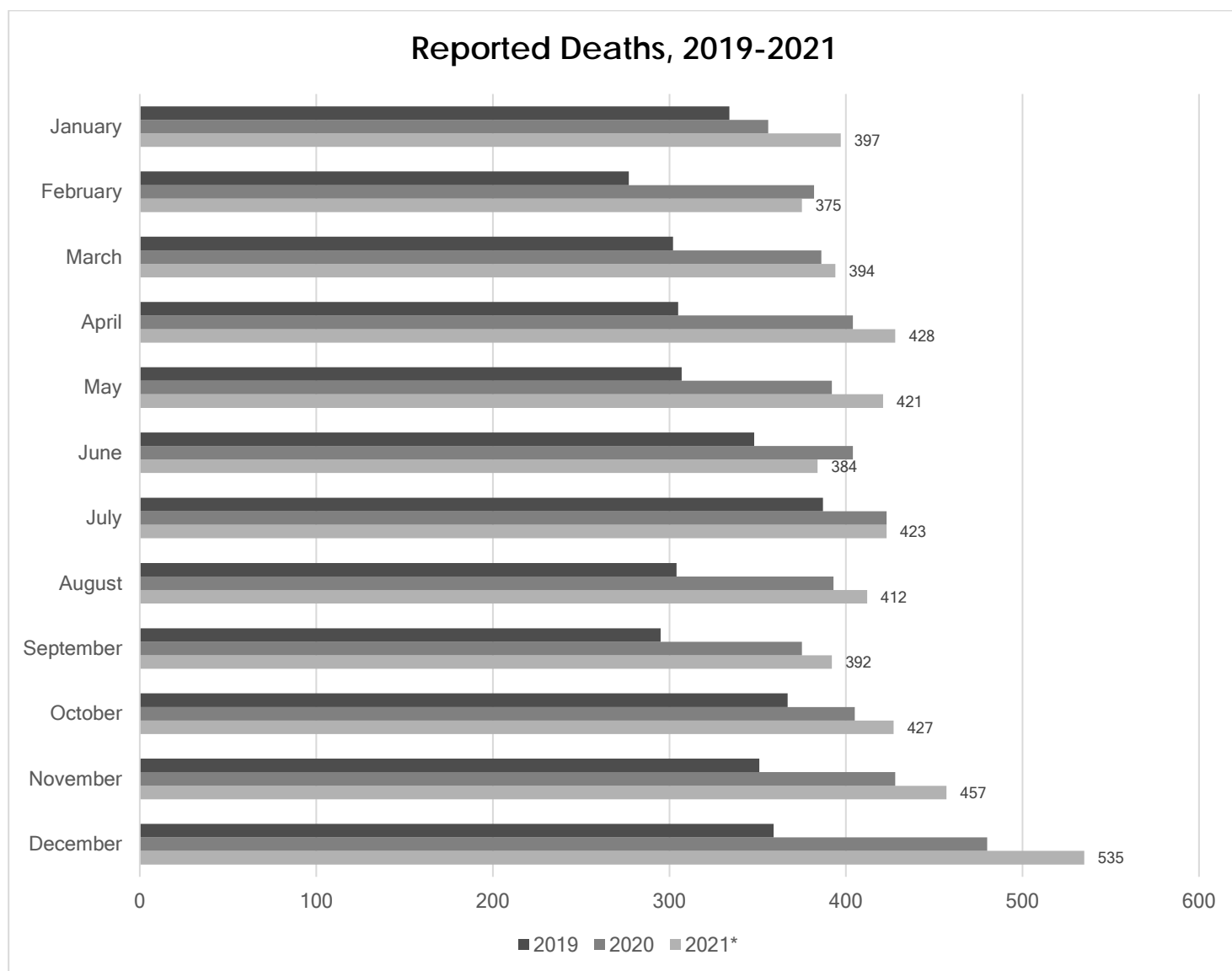
*2021 data does not include Cass County for a more accurate comparison

¹ Note: 2020 data does not include Cass County, as we took over as the MEO in February 2021

Significant Statistics Related to COVID-19 Pandemic

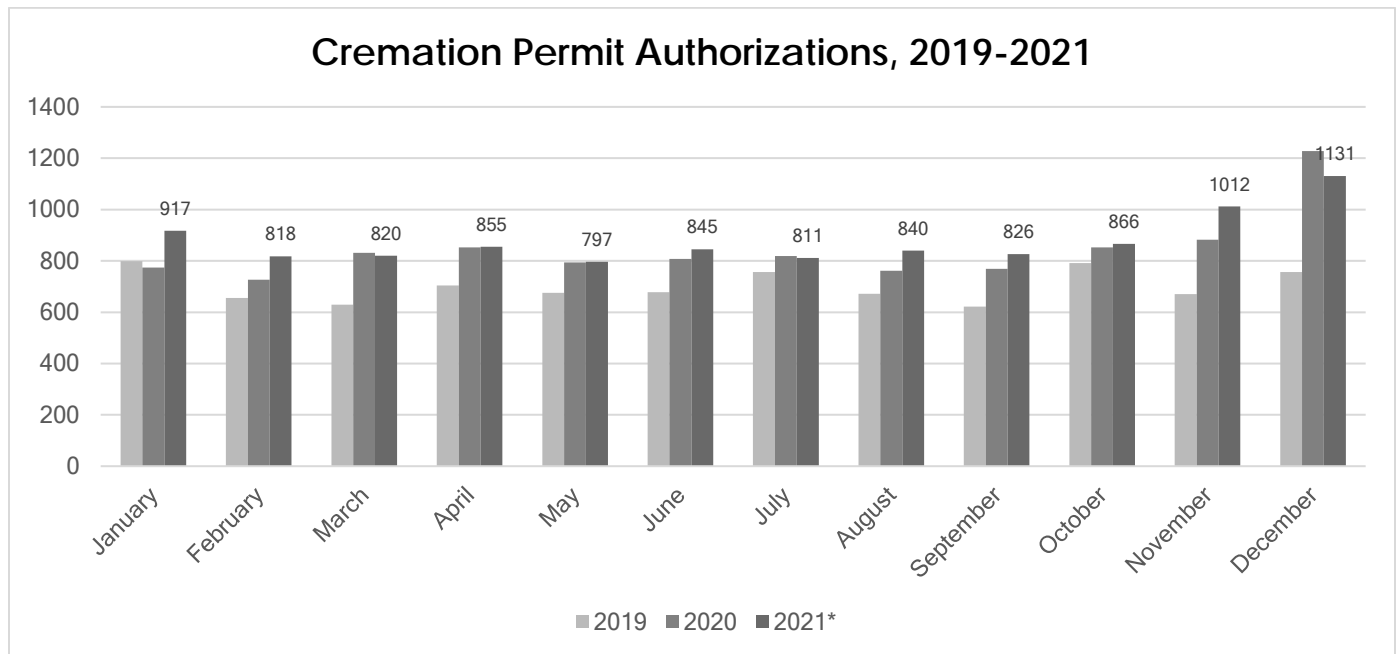
Shortly after the start of the pandemic, our team recognized an increase in reported deaths with a specific increase in deaths occurring outside of a healthcare setting, thus requiring notification to our office. The number of deaths released directly from the scene to the funeral home increased from 1,727 in 2019 to an extraordinary 2,265 in 2020 (31.2% increase from 2019 to 2020). In 2021, the number of deaths released directly from the scene decreased to 2,237 (1.2% decrease from 2020 to 2021).

The graph below shows the number of reported deaths to our office broken down by month and includes 11 counties we serve as the Medical Examiner. As we began serving Cass County in February 2021, the graph below does not include this county for a more accurate comparison to previous years. The total number of reported deaths increased by 28% from 2019 to 2021. In the month of December alone, the number of reported deaths for these 11 counties increased by 49% from 2019 to 2021.



*2021 data does not include Cass County for a more accurate comparison

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 and again in December of 2021, 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.



*2021 data does not include Cass County for a more accurate comparison

Deaths related to opioids and other drugs

Annual Report 2021

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

This report is in memory of those who lost their life or a loved one to substance use.

These losses must motivate us all to prevent future deaths.

Purpose: This data was collected by the Office of the Medical Examiner (MEO) in the Department of Pathology at Western Michigan University Homer Stryker M.D. School of Medicine (WMed). Unless otherwise noted, data is from 2021 and includes deaths where drugs were the immediate cause of death. This report is meant to provide up to date statistics to those involved in efforts to reduce the number of drug-related deaths.

Sections with the following headings are approximations and frequencies may be higher than what is reported: Health Factors, Mental Health Factors, Social Factors, Children and Substance Use History.

Sources: All data was extracted from a Medical Examiner database, law enforcement (LE) reports, EMS runsheets, death certificates, obituaries, medical records, toxicology reports, and autopsy reports.

Note: Cass county started working with this MEO in 2021. Comparison data for previous years is excluded where indicated (page 3).

AI/H: American Indian and Hispanic; A=Asian; B=Black/African-American; B/H=Black and Hispanic; H=Hispanic; ME=Middle Eastern; W=White; W/AI=White/American Indian; E=Female; M=Male

Please email questions to pathology@med.wmich.edu

County reports are available here: <https://mimedicalexaminer.com/node/27>

Office of the Medical Examiner
Department of Pathology
Homer Stryker M.D. School of Medicine

Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

All drug-related deaths: Allegan

Age	Race	Sex	Death certificate: Substances contributing to death	Injury Zip code
19	B	M	fentanyl	49010
27	W	M	fentanyl, ethanol	49010
28	W	M	fentanyl, ethanol, cocaine	49078
36	W	F	fentanyl, methamphetamine, xylazine, alprazolam, hydroxyzine	49080
41	H	M	fentanyl	49423
45	W	M	fentanyl, methamphetamine	49348
45	W	M	methamphetamine	49408
50	W	M	fentanyl, cocaine	unknown
54	W	F	alprazolam, oxycodone, duloxetine, gabapentin, trazodone, diphenhydramine	49078
58	W	M	methamphetamine	unknown
60	H	M	methamphetamine, ethanol	49423
61	W	M	tramadol, gabapentin, trazodone, duloxetine	49078
66	W	M	chloroethane	49080

Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

All drug-related deaths: Barry.

Age	Race	Sex	Death certificate: Substances contributing to death	Injury Zip code
30	W	F	methamphetamine, fentanyl	49058
35	W	F	fentanyl, alprazolam	49046
39	W	M	fentanyl, heroin, etizolam, diphenhydramine	49348
46	W	F	oxycodone, zolpidem, gabapentin	49058

Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

All drug-related deaths: Berrien

Age	Race	Sex	Death certificate: Substances contributing to death	Injury Zip code
22	W	M	cocaine metabolites, ethanol, fentanyl, promethazine	49106
27	W	M	fentanyl, para-fluorofentanyl, methamphetamine	49038
29	B	M	fentanyl	49022
30	W	M	fentanyl, methamphetamine	49085
32	W	F	acetyl-fentanyl, fentanyl, methamphetamine, para-fluorofentanyl	49117
32	ME	M	diazepam, fentanyl, heroin, methamphetamine	49120
32	W	M	fentanyl, heroin, methamphetamine	Unknown
33	W	F	fentanyl, methadone, methamphetamine, para-fluorofentanyl	49022
33	W	M	fentanyl, methamphetamine	49120
34	B	M	ethanol, fentanyl, para-fluorofentanyl	49022
34	W	M	fentanyl, para-fluorofentanyl	49085
34	W	M	Pt. I: cardiac tamponade due to hemopericardium; Pt. II: methamphetamine*	49107
35	W	M	ethanol, etizolam, methamphetamine	49107
37	W	M	fentanyl, heroin, methamphetamine	49120
38	B	F	acute ethanol intoxication*	Unknown
39	W	M	chlordiazepoxide, ethanol, fentanyl	49022
39	W	F	fentanyl, hydroxyzine, methamphetamine, oxycodone, para-flourofentanyl, tramadol	49022
40	W	M	ethanol, methadone	49120
41	W	F	ethanol, fentanyl, methamphetamine, para-flourofentanyl	49120

Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

All drug-related deaths: Berrien

Age	Race	Sex	Death certificate: Substances contributing to death	Injury Zip code
45	W	F	alprazolam, fentanyl, heroin	49107
45	W	M	cocaine-metabolite, fentanyl, para-fluorofentanyl	49127
48	W	F	methamphetamine	49002
48	W	F	cocaine, methamphetamine	49111
52	B	M	cocaine, fentanyl, tramadol	49022
53	B	M	fentanyl	49022
54	W	F	7-amino clonazepam, alprazolam, dicyclomine, methadone, olanzapine, paroxetine, venlafaxine	Unknown
54	H	M	fentanyl	49022
55	W	M	alprazolam, diphenhydramine, fentanyl, hydrocodone, tramadol	49128
57	W	M	fentanyl, mitragynine	49085
57	W	M	fentanyl, methamphetamine	49127
58	W	M	morphine, oxycodone	49038
58	W	M	methamphetamine	49022
62	B	F	acetaminophen	49022
67	B	F	cyclobenzaprine, diphenhydramine, hydrocodone, gabapentin	49022
71	W	M	7-amino clonazepam, methadone	49120
72	B	M	Pt. I: intracerebral hemorrhage; Pt. II: cocaine*	49022
73	W	M	amphetamine, methamphetamine	49128

Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

All drug-related deaths: Cass

Age	Race	Sex	Death certificate: Substances contributing to death	Injury Zip code
25	W	M	fentanyl, heroin, methamphetamine	49112
28	W	M	fentanyl, heroin	49120
29	W	M	fentanyl, heroin, para-fluorofentanyl, xylazine	49047
36	W	F	fentanyl, mitragynine	49047
41	W	M	diphenhydramine, fentanyl, heroin, methamphetamine	49120
42	W	F	amlodipine, citalopram/escitalopram	49031
44	W	F	fentanyl, para-fluorofentanyl	49047
53	W	M	fentanyl, methamphetamine	49061
60	W	F	fentanyl, gabapentin, methamphetamine	49120

Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

All drug-related deaths: Calhoun

Age	Race	Sex	Death certificate: Substances contributing to death	Injury Zip code
23	B	F	fentanyl, para-fluorofentanyl, xylazine	49015
23	W	M	fentanyl, methamphetamine, para-fluorofentanyl	unknown
27	W	M	fentanyl, methamphetamine, para-fluorofentanyl	49037
29	W	M	fentanyl, methamphetamine, para-fluorofentanyl, tramadol, xylazine	49068
31	W	M	fentanyl, gabapentin	49033
31	W	F	fentanyl, para-fluorofentanyl	49011
32	W	M	ethanol, fentanyl	49037
32	W	F	methamphetamine	unknown
32	B	M	methamphetamine	49017
33	W	M	fentanyl, para-fluorofentanyl	unknown
34	W	M	etizolam, fentanyl, morphine, para-fluorofentanyl, xylazine	49037
34	W	M	acetyl-fentanyl, fentanyl	49037
35	W	F	fentanyl, para-fluorofentanyl	49017
36	H	M	alprazolam, fentanyl, methamphetamine	49037
36	W	F	fentanyl	49037
37	W	M	fentanyl, heroin, methamphetamine, para-fluorofentanyl	49014
37	H	F	fentanyl, methamphetamine	49017
37	W	F	ethanol, fentanyl, gabapentin, hydrocodone, tramadol	49037
37	B	M	Pt. I: Brainstem intraparenchymal hemorrhage; Pt. II: MDMA*	49017
38	W	F	fentanyl, heroin, methadone, para-fluorofentanyl	49017

Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

All drug-related deaths: Calhoun

Age	Race	Sex	Death certificate: Substances contributing to death	Injury Zip code
39	W	F	methamphetamine	49017
39	W	M	fentanyl, methamphetamine, para-fluorofentanyl, tramadol, xylazine,	49015
39	W	M	alprazolam, fentanyl	49015
39	W	F	fentanyl, para-fluorofentanyl	49014
39	W	M	methamphetamine	unknown
40	W	M	fentanyl, xylazine	49037
40	W	M	fentanyl, morphine	49037
40	W	M	ethanol, cocaethylene, fentanyl, hydrocodone, para-fluorofentanyl	49037
41	B	F	fentanyl, heroin, methamphetamine, para-fluorofentanyl	49015
41	W	M	fentanyl, methamphetamine, para-fluorofentanyl	49017
41	H	M	fentanyl	49015
41	W	M	cocaine	49017
42	W	M	methamphetamine	49037
42	W	F	ethanol, fentanyl, methamphetamine	49037
45	W	M	fentanyl, methamphetamine	49037
48	B/H	M	fentanyl	49017
48	W	M	ethanol, fentanyl, para-fluorofentanyl	unknown
49	W	F	ethanol, hydroxyzine, mitragynine	49017
50	B	M	ethanol, fentanyl	49037
51	W	F	cocaine	49015

Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

All drug-related deaths: Calhoun

Age	Race	Sex	Death certificate: Substances contributing to death	Injury Zip code
52	W	F	tramadol	49015
53	W	M	methamphetamine	49068
53	W	M	clonazepam, clozapine	49014
54	W	F	fentanyl, hydroxyzine, methamphetamine, morphine, trazodone	49014
54	W	M	cocaethylene, cocaine, ethanol, fentanyl	49015
54	W	M	alprazolam, cyclobenzaprine, fentanyl, heroin, tramadol	49017
56	W	M	ethanol	49017
56	W	M	cocaine, fentanyl	49015
57	W	M	fentanyl, methamphetamine	49029
58	W	M	cyclobenzaprine, fentanyl, gabapentin, tramadol	49068
58	W	F	alprazolam, methadone	49037
59	W	F	duloxetine, gabapentin, hydrocodone, methadone	49014
59	B	M	ethanol, fentanyl, methamphetamine	49037
60	W	F	fentanyl, methadone	49015
60	B	M	cocaine, fentanyl	49014
62	W	M	fentanyl, methamphetamine	49015
66	B	M	fentanyl	49015
68	W	M	alprazolam, diazepam, fentanyl, heroin,	49015
72	B	M	cocaine, fentanyl, morphine, para-fluorofentanyl, xylazine	49037
81	B	M	fentanyl, tramadol, xyalzine	49037

Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

All drug-related deaths: Grand Traverse

Age	Race	Sex	Death certificate: Substances contributing to death	Injury Zip code
29	W	M	fentanyl, methamphetamine	49685
31	W	M	fentanyl, methamphetamine	49685
32	W	M	fentanyl, heroin	49686
32	H	M	fentanyl	49617
32	W	F	mitragynine	49686
36	A	M	diazepam, fentanyl	49685
38	W	M	fentanyl, methamphetamine, para-fluorofentanyl	49601
39	W	M	diazepam, fentanyl	49650
41	AI/H	M	acetyl-fentanyl, fentanyl, mitragynine, para-fluorofentanyl	49643
42	W	M	7-amino clonazepam, acetyl-fentanyl, cocaine, fentanyl, heroin, meth-amphetamine, mitragynine, nordiazepam, para-fluorofentanyl, xylazine	49686
43	W	F	fentanyl, methamphetamine	Unknown
44	W	M	fentanyl	49685
48	W	M	fentanyl	49686
56	W	F	amitriptyline, gabapentin	49686
57	W	M	acetyl-fentanyl, fentanyl, heroin, methamphetamine, para-fluorofentanyl	49633
66	W	M	clonazepam, diphenhydramine	49616
68	B	M	fentanyl, methamphetamine, para-fluorofentanyl	49643
68	W	F	bupropion	49649
68	B	M	ethanol, fentanyl, methylphenidate, para-fluorofentanyl, ritalinic acid, xylazine	49686

Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

All drug-related deaths: Kalamazoo

Age	Race	Sex	Death certificate: Substances contributing to death	Injury Zip code
23	W	F	fentanyl	49008
23	B	M	methamphetamine	Unknown
24	B	M	acetyl-fentanyl, fentanyl, heroin, methamphetamine	49009
25	W	F	fentanyl, methamphetamine	49017
25	W	F	fentanyl, methamphetamine, morphine	49002
25	W	M	Acute and chronic ethanol use*	Unknown
26	B	M	fentanyl, methamphetamine	49048
26	W	M	alprazolam, fentanyl, methamphetamine	49009
27	W	F	fentanyl, methamphetamine, para-fluorofentanyl	49001
27	W	F	alprazolam, fentanyl, heroin, para-fluorofentanyl	49007
30	W	M	methamphetamine	Unknown
30	W	M	fentanyl	49004
31	W	M	Pt. I: cardiac tamponade due to aortic dissection; Pt. II: methamphetamine*	49048
32	B	M	cocaine	Unknown
33	W	M	fentanyl, tramadol	49007
33	W	M	fentanyl, heroin, methadone, para-fluorofentanyl	49024
35	A	F	alprazolam, fentanyl, heroin, methamphetamine, para-fluorofentanyl, sertraline,	49002
35	W	M	acetyl fentanyl, alprazolam, cocaine, fentanyl, hydrocodone, para-fluorofentanyl	49007
35	W	F	fentanyl, methamphetamine	49037
36	W	M	fentanyl	49014

Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

All drug-related deaths: Kalamazoo

Age	Race	Sex	Death certificate: Substances contributing to death	Injury Zip code
36	W	M	ethanol, fentanyl, mitragynine	49006
36	B	F	fentanyl, cocaine, cocaethylene, ethanol	49008
36	W	M	fentanyl	49008
37	W	F	methamphetamine	49008
37	W	M	alprazolam, fentanyl, para-fluorofentanyl	49048
38	W	F	alprazolam, methamphetamine, oxycodone	49245
38	W	F	Pt. I: complications of type I diabetes mellitus; Pt. II: methamphetamine*	49024
39	W	M	fentanyl, para-fluorofentanyl	Unknown
39	B	M	acetyl-fentanyl, fentanyl, methamphetamine, para-fluorofentanyl	49007
39	W	F	fentanyl, fluoxetine, methamphetamine, norfluoxetine	49007
39	W	M	ethanol, fentanyl	49007
40	W	M	Acute and chronic ethanol use*	49009
41	W	M	chlordiazepoxide, diphenhydramine, fentanyl, heroin, para-fluorofentanyl, tramadol, xylazine	49012
41	W	M	cocaethylene, cocaine, ethanol, fentanyl, para-fluorofentanyl	49024
42	W	M	fentanyl, methamphetamine, mitragynine, para-fluorofentanyl	49007
42	B	M	methamphetamine	Unknown
42	B	M	Pt I: hypertensive cardiovascular disease; Pt. II: cocaine*	49001
43	W	M	methamphetamine, nordiazepam, orphenadrine, oxycodone	49093
44	W	M	fentanyl, para-fluorofentanyl, acetyl-fentanyl	49006
45	B	M	butalbital, ethanol, heroin	49008

Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

All drug-related deaths: Kalamazoo

Age	Race	Sex	Death certificate: Substances contributing to death	Injury Zip code
45	B	F	cocaethylene, cocaine, ethanol, fentanyl, para-fluorofentanyl	49007
45	W	M	fentanyl, gabapentin	49006
45	B	M	methamphetamine	49001
47	W	F	fentanyl	Unknown
49	W	F	Pt. I: gastrointestinal hemorrhage, uncertain source; Pt. II: chronic alcohol use, methamphetamine*	49001
50	W	F	fentanyl, methamphetamine, para-fluorofentanyl	49048
50	W	M	fentanyl, methamphetamine	49009
50	W	F	diphenhydramine, gabapentin, hydrocodone	49002
50	B	M	cocaethylene, cocaine, ethanol, fentanyl, methamphetamine	49007
50	B	M	methamphetamine	49048
50	W	F	diazepam, fentanyl, gabapentin, morphine	49048
52	W	M	amitriptyline, hydrocodone, methamphetamine	49001
54	W	M	methamphetamine	49007
54	B	M	methamphetamine	49001
54	B	M	acetyl-fentanyl, fentanyl, methamphetamine, para-fluorofentanyl	49007
55	W	M	methamphetamine	49001
55	B	M	cocaethylene, ethanol, fentanyl	49048
55	W	F	alprazolam, diphenhydramine, methadone, trazodone	49001
55	W	F	methamphetamine	Unknown
55	W	F	fentanyl, gabapentin, methadone, para-fluorofentanyl, promethazine, tramadol	49048

Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

All drug-related deaths: Kalamazoo

Age	Race	Sex	Death certificate: Substances contributing to death	Injury Zip code
56	W	F	acetyl-fentanyl, fentanyl, gabapentin, hydroxyzine, mitragynine, morphine	49006
56	B	M	methamphetamine	49007
56	W	M	fentanyl, methamphetamine	Unknown
57	W	M	acetaminophen	49002
57	B	F	fentanyl, para-fluorofentanyl, methamphetamine	49048
57	W	F	methamphetamine	49001
58	B	M	hydrocodone	49001
58	W	F	fentanyl, methamphetamine	49009
58	W	F	fentanyl, gabapentin	49079
58	W	M	amlodipine, ethanol, metoprolol, venlafaxine	49009
60	W	F	ethanol, fentanyl	49048
60	W	M	doxepin, duloxetine, methadone	49090
60	B	M	methamphetamine	49007
60	W	F	ethanol, fentanyl, methamphetamine,	49001
60	W	M	acetyl-fentanyl, ethanol, fentanyl, para-fluorofentanyl,	49053
61	W	M	Pt. I: sudden cardiac event; Pt. II: cocaine*	49001
61	W	M	gabapentin, methadone	49001
61	B	F	clonazepam, duloxetine, fentanyl, fluoxetine, morphine	49007
62	W	M	gabapentin, tramadol	49034
62	W	F	1,1-difluoroethane, bromazolam, fentanyl, methamphetamine, para-fluorofentanyl,	49006

Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

All drug-related deaths: Kalamazoo

Age	Race	Sex	Death certificate: Substances contributing to death	Injury Zip code
62	W	M	Pt. I: pulmonary thromboemboli; Pt. II: fentanyl, methadone*	49048
63	W	M	1,1-difluoroethane, bromazolam, fentanyl, methamphetamine, para-fluorofentanyl,	49048
63	W	M	Pt. I: pulmonary thromboemboli; Pt. II: fentanyl, methadone*	49007
64	B	M	cocaine	49048
65	W	F	methamphetamine	Unknown
66	B	M	fentanyl, nordiazepam, para-fluorofentanyl	49048
66	B	M	Pt. I: intracerebral hemorrhage; Pt. II: cocaine*	49007
69	W	F	cocaine, ethanol	49048
70	W	F	sertraline	49080
70	B	M	Pt. I: gastric ulcer (perforated); Pt. II: acetyl-fentanyl, fentanyl, heroin*	49001
71	B	F	fentanyl, heroin	49048
76	W	F	methamphetamine	49002

Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

All drug-related deaths: Leelanau

Age	Race	Sex	Death certificate: Substances contributing to death	Injury zip code
33	W	M	fentanyl	49654
38	W	M	ethanol, hydroxyzine, nordiazepam	49670
41	W	M	acetyl-fentanyl, diphenhydramine, fentanyl, methadone, methamphetamine, morphine	49682
60	W	M	diphenhydramine, fentanyl	49664

All drug-related deaths: Mason

Age	Race	Sex	Death certificate: Substances contributing to death	Injury zip code
27	W	F	amitriptyline, citalopram, fluoxetine, mirtazapine, topiramate	49431
28	W	M	fentanyl, methamphetamine	49454
35	W	M	alprazolam, fentanyl, methamphetamine, mitragynine, para-fluorofentanyl	49431
35	W	M	cocaine, fentanyl, methamphetamine	Unknown
36	W	M	fentanyl, methamphetamine, para-fluorofentanyl	49431
38	W	F	buprenorphine, bupropion, methamphetamine, venlafaxine	49431
57	W	F	7-aminoclonazepam, acetyl-fentanyl, cocaine, fentanyl	49431
69	W	F	diphenhydramine, duloxetine, oxycodone, topiramate	49449

All drug-related deaths: Osceola

Age	Race	Sex	Death certificate: Substances contributing to death	Injury zip code
32	W	M	fentanyl, methamphetamine	49631
34	W	M	cyclobenzaprine, fentanyl, methamphetamine, para-fluorofentanyl, xylazine	49655
51	W	M	fentanyl, methamphetamine, methadone, tramadol	49631
53	B	M	fentanyl, methamphetamine	49639
61	W	M	methamphetamine	49677

Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

All drug-related deaths: Muskegon

Age	Race	Sex	Death certificate: Substances contributing to death	Injury Zip code
19	W	F	fentanyl, mitragynine	49440
19	B	M	amitriptyline	49442
20	W	M	fentanyl, heroin	49441
21	W	F	fentanyl, methamphetamine	49444
22	W	M	mitragynine	49461
23	B	M	ethanol, fentanyl	49441
26	W	F	cocaine, ethanol, fentanyl	49441
28	W	F	cocaine, fentanyl	49440
29	W	M	fentanyl, methamphetamine	49441
29	B	F	alprazolam, fentanyl, hydrocodone	49441
29	W	F	fentanyl, methamphetamine, morphine	49442
30	W	M	fentanyl, methamphetamine	49456
30	W	M	fentanyl, methamphetamine, para-fluorofentanyl	49442
30	H	M	methamphetamine	Unknown
32	B	M	acetyl fentanyl, chlorpheniramine, diphenhydramine, fentanyl, hydrocodone	49442
33	W	F	fentanyl, gabapentin, morphine, para-fluorofentanyl, tramadol	49461
33	W	F	fentanyl, heroin, methamphetamine, para-fluorofentanyl	49444
33	ME	M	cocaine, fentanyl, hydroxyzine, gabapentin	49442
34	W	F	1,1-difluoroethane	49437
35	W	F	cocaine, fentanyl, para-fluorofentanyl	49441

Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

All drug-related deaths: Muskegon

Age	Race	Sex	Death certificate: Substances contributing to death	Injury Zip code
36	B	M	cocaine, ethanol, fentanyl	49442
36	W	M	diphenhydramine, fentanyl, methamphetamine, para-fluorofentanyl	49445
37	W	F	methamphetamine, mitragynine	49444
37	W	M	fentanyl	49442
38	W	F	diphenhydramine, fentanyl, gabapentin, trazodone	49441
39	W	M	cocaine, fentanyl	49442
40	W	M	fentanyl, methamphetamine, xylazine	49451
40	W	F	fentanyl, methamphetamine, para-fluorofentanyl	49441
40	W	M	amphetamine, cyclobenzaprine, diazepam, fentanyl, heroin, oxycodone	49445
43	W	F	fentanyl	49442
45	W	M	methamphetamine	49437
46	B	M	cocaine, cocaethylene, ethanol, fentanyl, methamphetamine	49442
47	W	M	fentanyl	49441
47	W	M	butyrylfentanyl, diphenhydramine, fentanyl	49442
48	W	M	fentanyl, hydrocodone, para-fluorofentanyl	Unknown
49	W	F	methamphetamine, methylphenidate	49444
49	B	M	cocaine, ethanol, fentanyl, morphine, para-fluorofentanyl	49444
49	W	F	fentanyl, methamphetamine, nordiazepam, para-Flourofentanyl	49441
51	W	M	fentanyl, methamphetamine	49442
51	W	M	cocaethylene, cocaine, ethanol, fentanyl, heroin	49441

Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

All drug-related deaths: Muskegon

Age	Race	Sex	Death certificate: Substances contributing to death	Injury Zip code
52	W	M	cocaethylene, cocaine, ethanol, fentanyl	49442
53	B	M	cocaine, fentanyl	49442
53	W	F	fentanyl, methamphetamine	49461
54	W	M	cyclobenzaprine, ethanol, fentanyl, gabapentin	49441
56	W	F	cocaine, fentanyl	49441
56	B	F	cocaine, fentanyl	49441
56	A	F	ibuprofen	49445
57	B	M	cocaine, fentanyl, heroin	49442
57	W	F	fentanyl, gabapentin	49442
57	B	M	cocaethylene, cocaine, ethanol, fentanyl, flubromazepam, para-fluorofentanyl, xylazine	49444
58	B	M	carisoprodol, fentanyl, hydrocodone, oxycodone, para-fluorofentanyl	49444
59	W	M	amphetamine, ethanol, fentanyl, hydrocodone	49444
59	B	F	fentanyl, methadone, methamphetamine	49444
60	W	M	salicylate	49442
60	W	M	fentanyl	49440
61	W	M	cocaine	49457
61	W	M	cocaethylene, cocaine, ethanol, fentanyl	49442
64	W	M	fentanyl, para-fluorofentanyl	49415
66	W	M	fentanyl	49421
66	W	F	acute and chronic ethanol use*	49441

Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

All drug-related deaths: Muskegon

Age	Race	Sex	Death certificate: Substances contributing to death	Injury Zip code
66	B	F	cocaethylene, cocaine, ethanol	49444
68	B	M	acetyl-fentanyl, fentanyl, heroin	49441
73	B	M	cocaine, hydrocodone, para-fluorofentanyl	49444
90	W	M	apixaban, hydrocodone, morphine	49441

Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

All drug-related deaths: St. Joseph

Age	Race	Sex	Death certificate: Substances contributing to death	Injury Zip code
30	B	F	alprazolam, fentanyl, hydrocodone	49093
31	W	F	ethylene glycol	49040
32	B	M	alprazolam, amphetamine, cocaine, fentanyl, methamphetamine	49093
37	W	F	fentanyl, methamphetamine	unknown
38	W	M	7-amino clonazapam, cyclobenzaprine, fentanyl, hydrocodone	49093
41	W	M	Pt. I: Staphylococcus aureus sepsis, source uncertain; Pt. II: methamphetamine*	Unknown
49	W	F	alprazolam, cyclobenzaprine, methamphetamine	unknown
59	W	F	Pt. I: Colonic perforation; Pt. II: methamphetamine, morphine, oxycodone, alprazolam, and gabapentin*	49072
60	B	M	cocaine, fentanyl	49093
61	W	M	fentanyl, methamphetamine, morphine, oxycodone	49093

Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

All drug-related deaths: Van Buren

Age	Race	Sex	Death certificate: Substances contributing to death	Injury Zip code
26	W	M	ethanol, fentanyl	49064
27	W	F	methamphetamine	49057
32	W	M	amphetamine, ethanol, fentanyl	49047
32	W	F	7-amino clonazepam, alprazolam, cocaine, fentanyl, hydrocodone, morphine	49090
33	W	M	methamphetamine	49079
35	W	M	fentanyl, gabapentin, mitragynine	49079
38	W	M	acetyl fentanyl, fentanyl, methamphetamine, para-flourofentanyl	49045
39	W	F	amitriptyline, methamphetamine, tramadol	49079
40	W/AI	M	ethanol, fentanyl, heroin, methamphetamine	49026
41	W	M	fentanyl, para-fluorofentanyl	49079
42	W	M	clonazepam/7-amino clonazepam, fentanyl, oxycodone	49071
45	W	F	cyclobenzaprine, ethanol, lorazepam, morphine	49026
48	W	M	fentanyl, methadone, morphine, para-fluorofentanyl	49013
49	W	M	acetyl-fentanyl, alprazolam, clonazepam, fentanyl, methamphetamine	49043
51	W	M	hydroxyzine, mirtazapine, sodium nitrite	49027
51	W	M	Pt. I: inferior right temporal lobe hemorrhage with subarachnoid hemorrhage; Pt. II: methamphetamine*	49056
54	W	F	fentanyl	49090
55	W	M	methamphetamine	49045
58	W	M	Pt. I: hypertensive cardiovascular disease; Pt. II: methamphetamine*	49026

Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

All drug-related deaths: Van Buren

Age	Race	Sex	Death certificate: Substances contributing to death	Injury Zip code
59	W	M	methamphetamine	49064
63	W	F	alprazolam, hydromorphone, morphine, methamphetamine	49079
75	W	M	phentermine	49038

*Not included in report (n=19)

Deaths Related to Opioids and Other Drugs

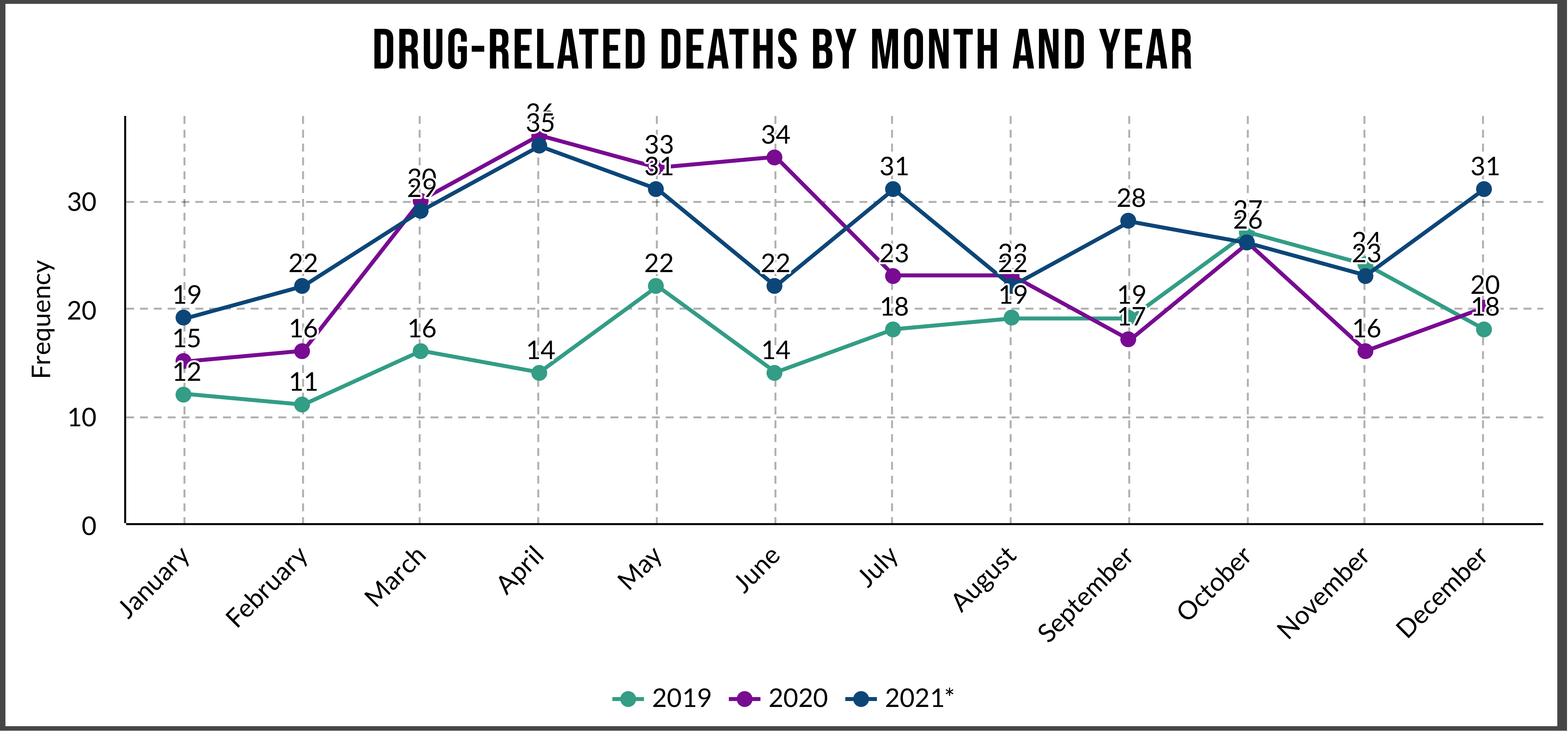
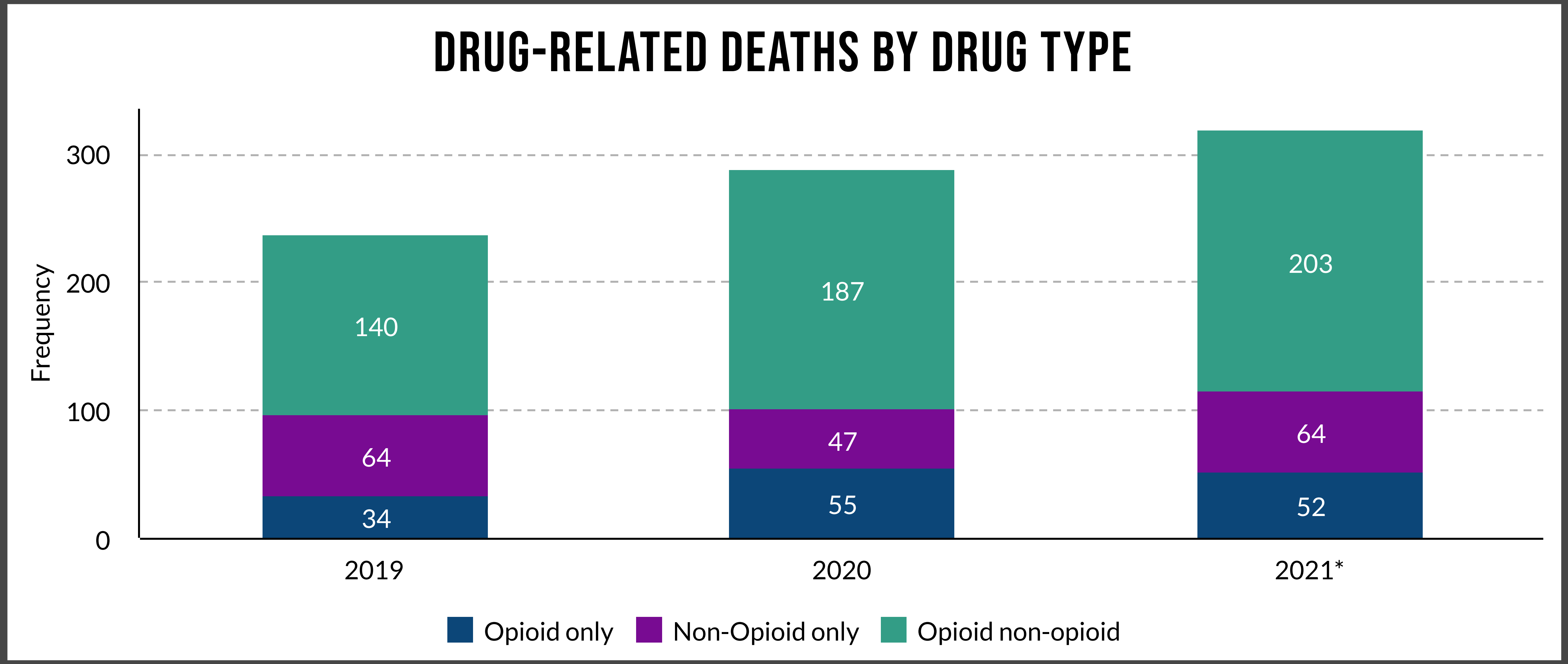
Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

Total Deaths Due to Drugs*

Year	2019	2020	2021*
Total deaths	238	289	319
Deaths per 10,000	2.0	2.4	2.6

Percent change*

 10% from 2020 to 2021

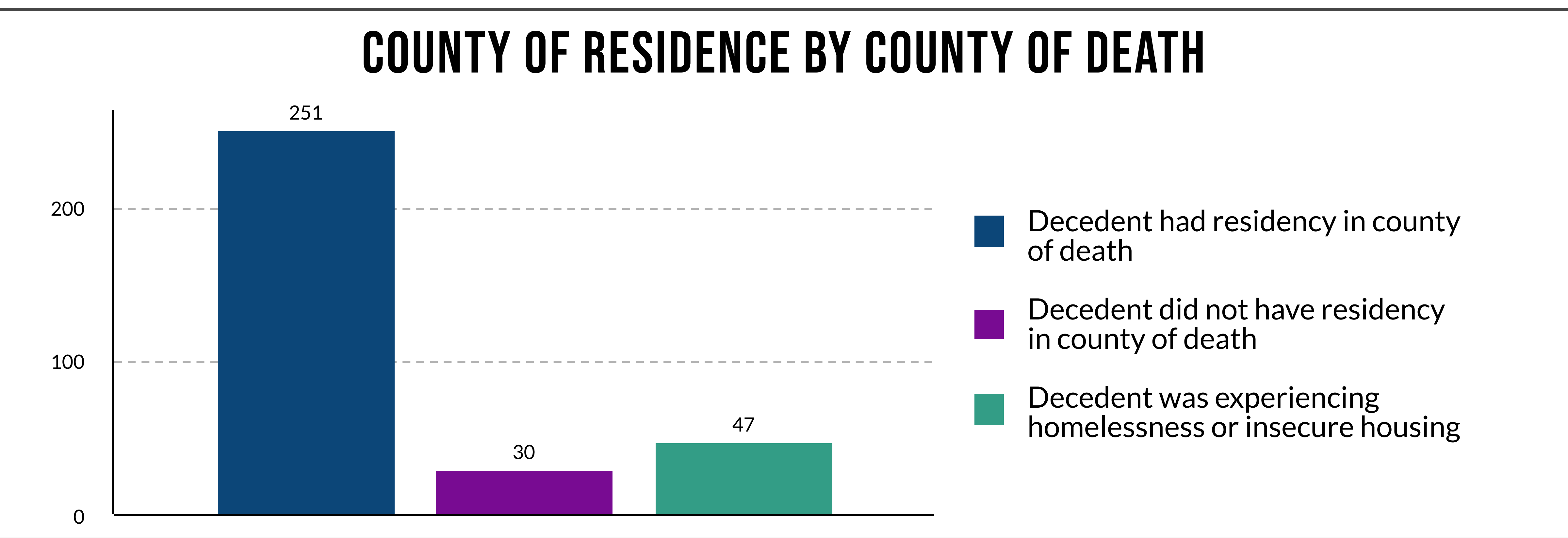
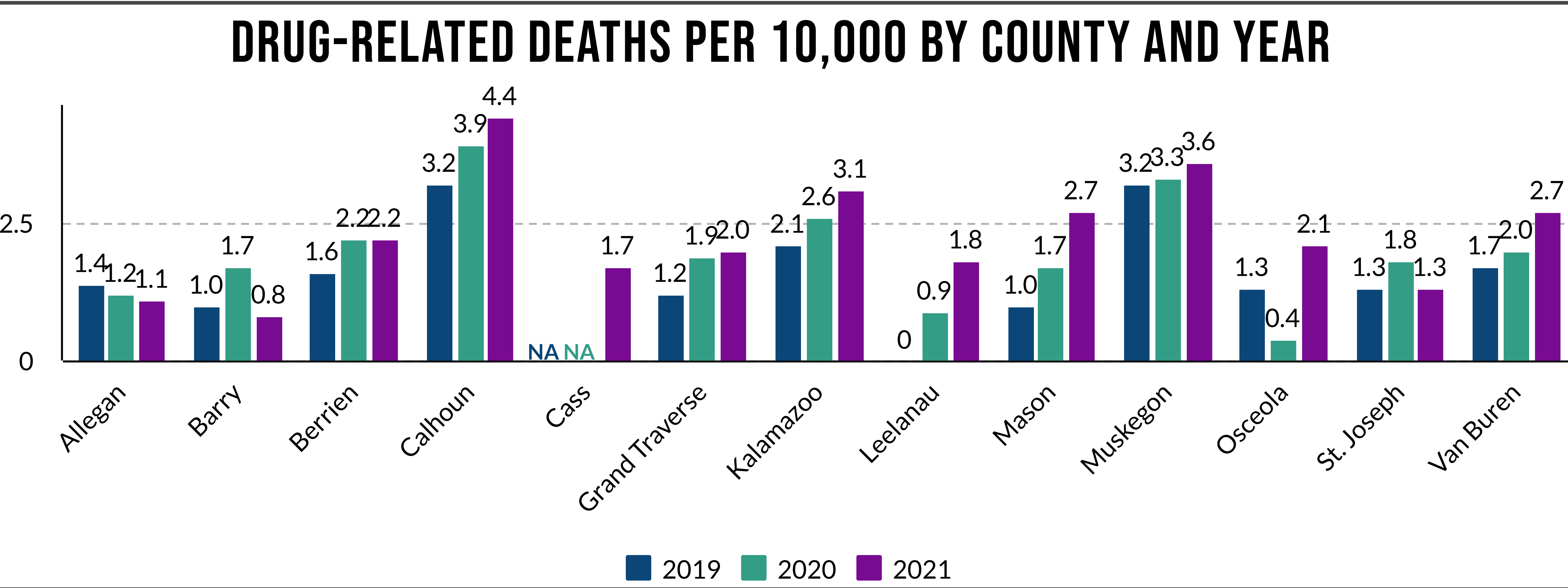
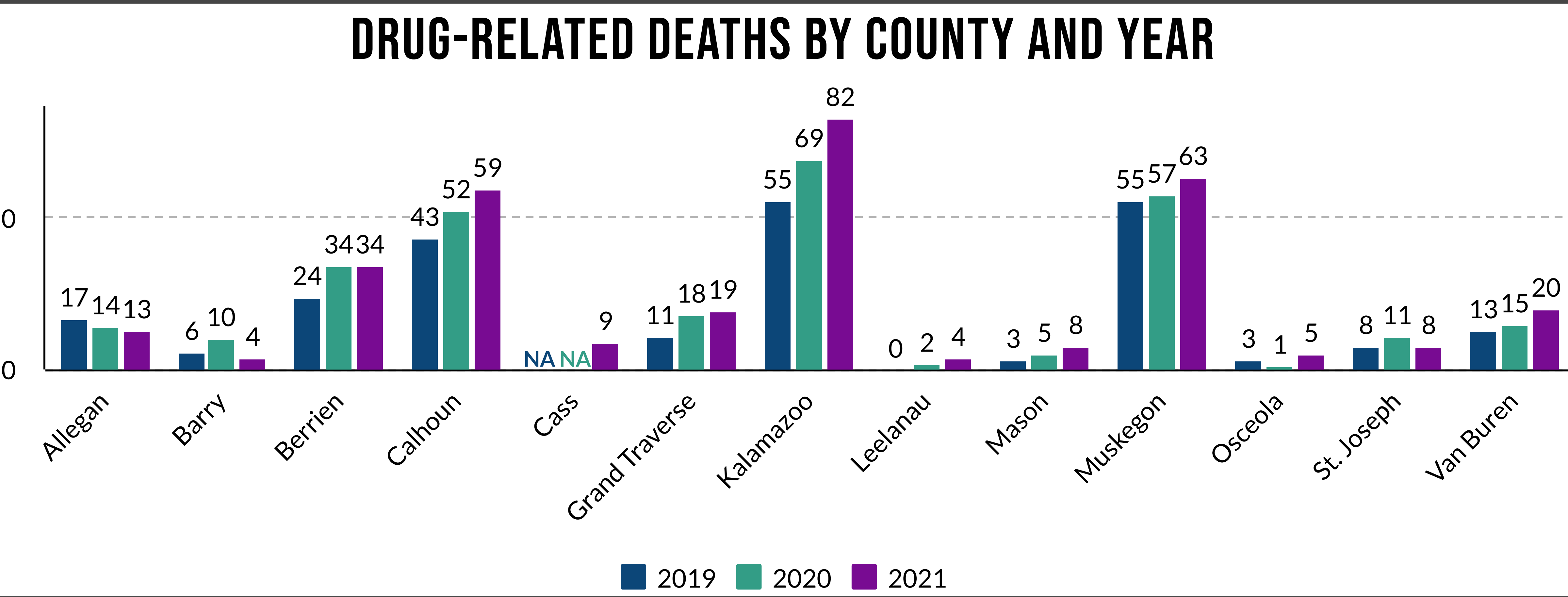


*Cass county excluded 2021 (n=9)

Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

Total Deaths Due to Drugs by County

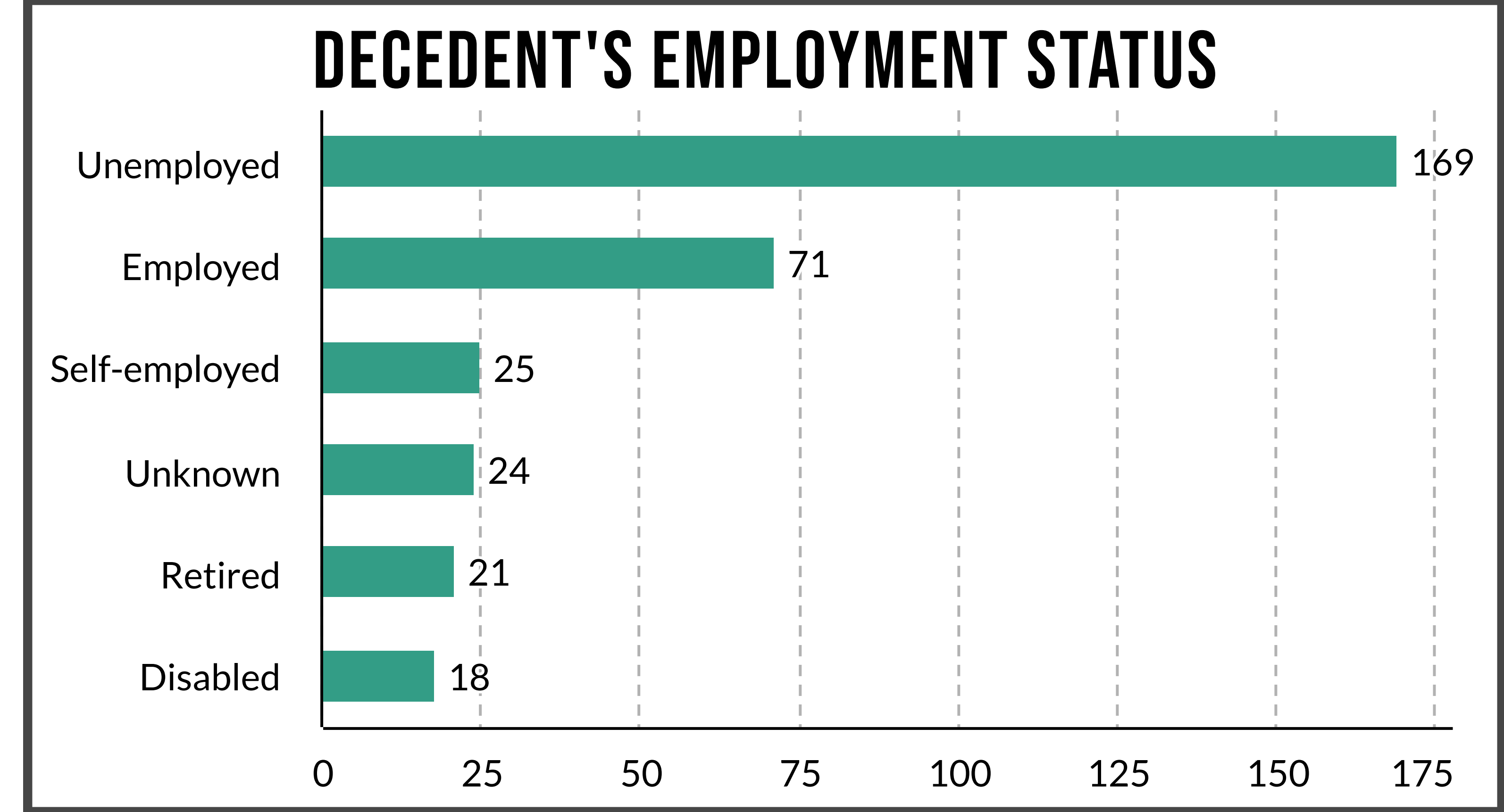


Deaths Related to Opioids and Other Drugs

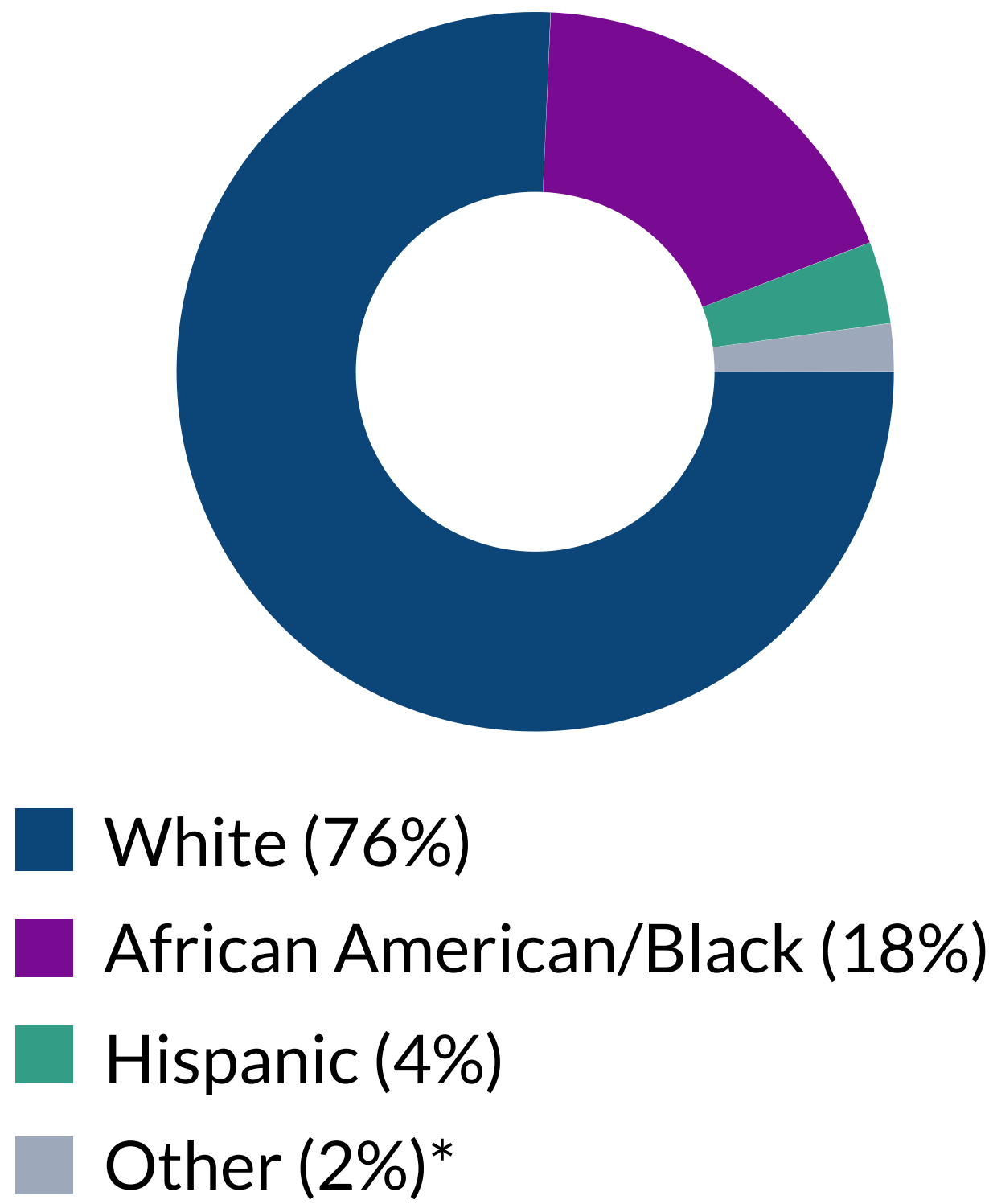
Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

Demographics

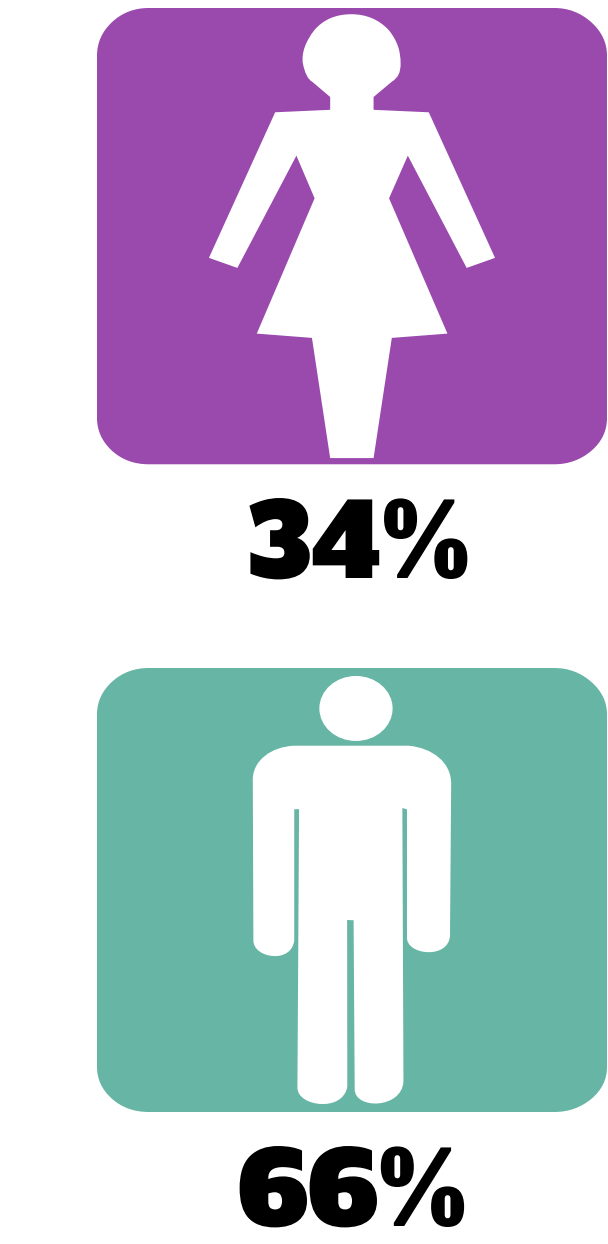
DECEDENT'S EMPLOYMENT STATUS



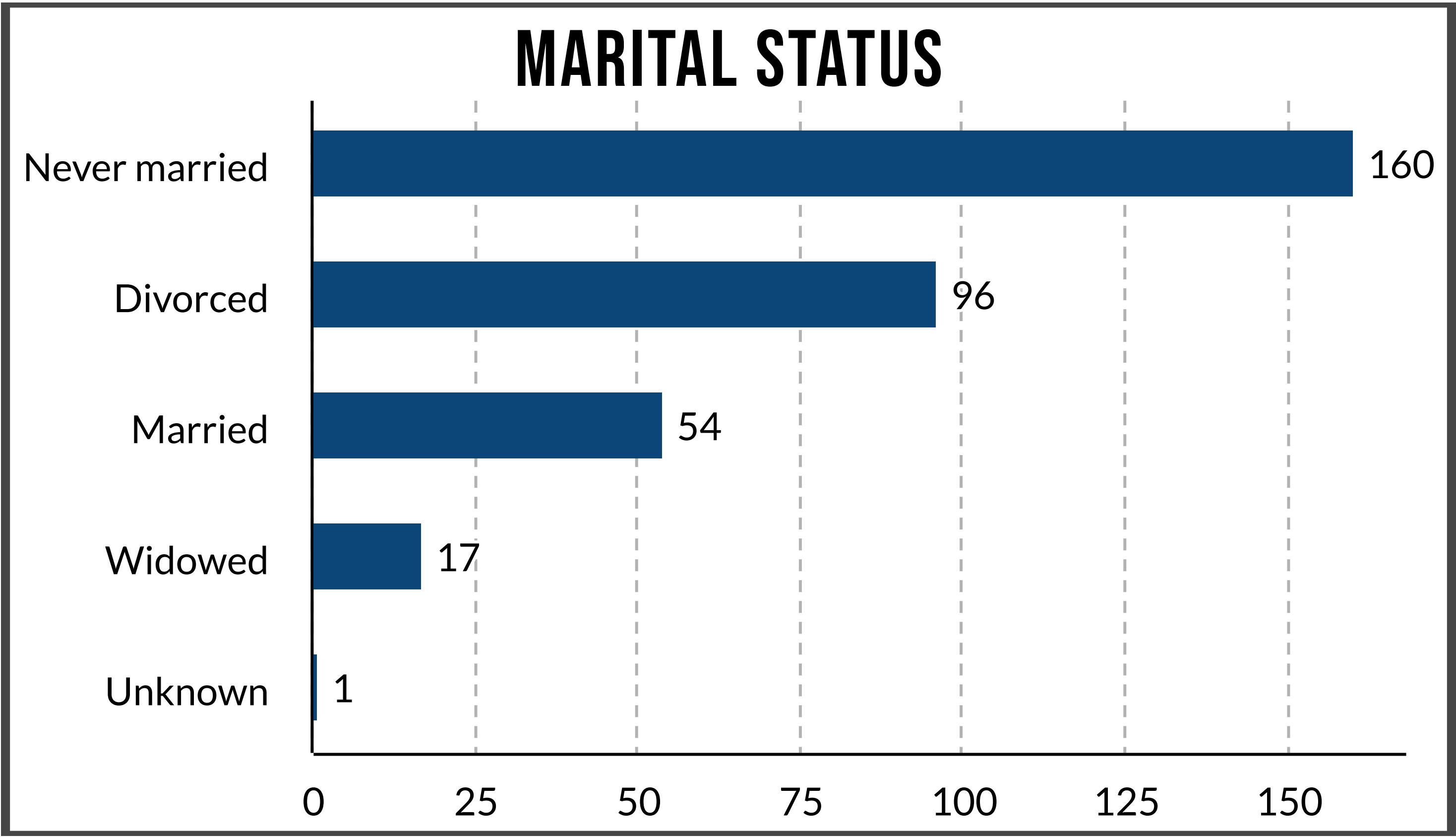
RACE



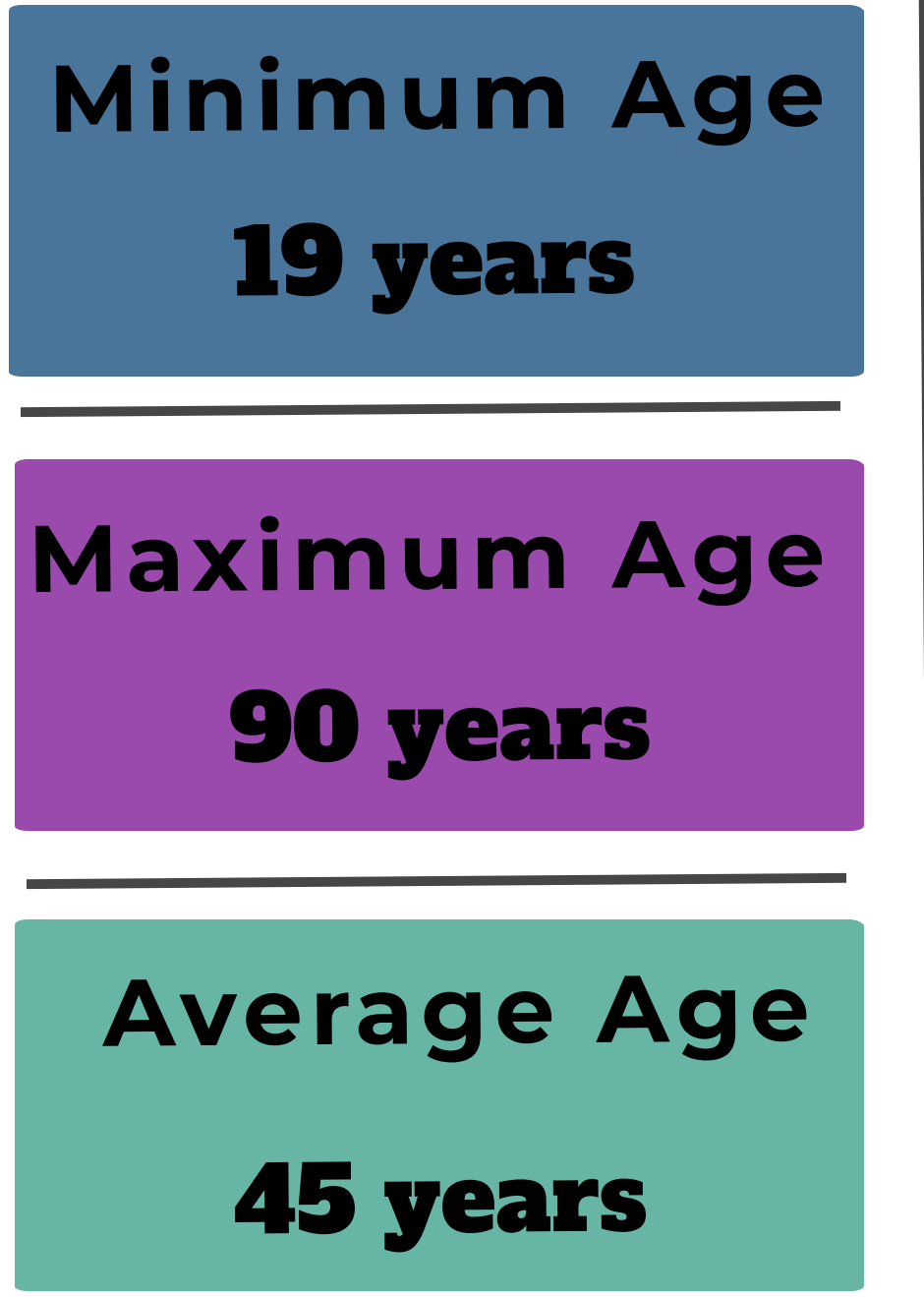
SEX



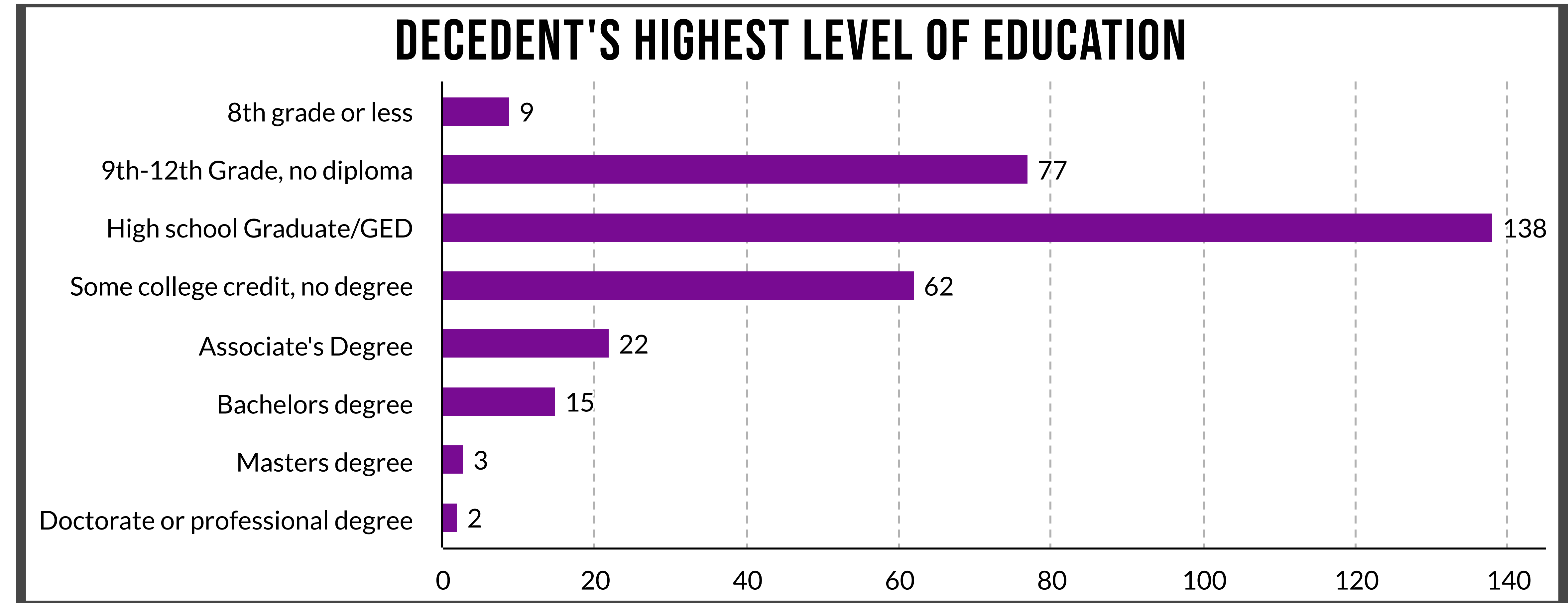
MARITAL STATUS



AGE



DECEDENT'S HIGHEST LEVEL OF EDUCATION



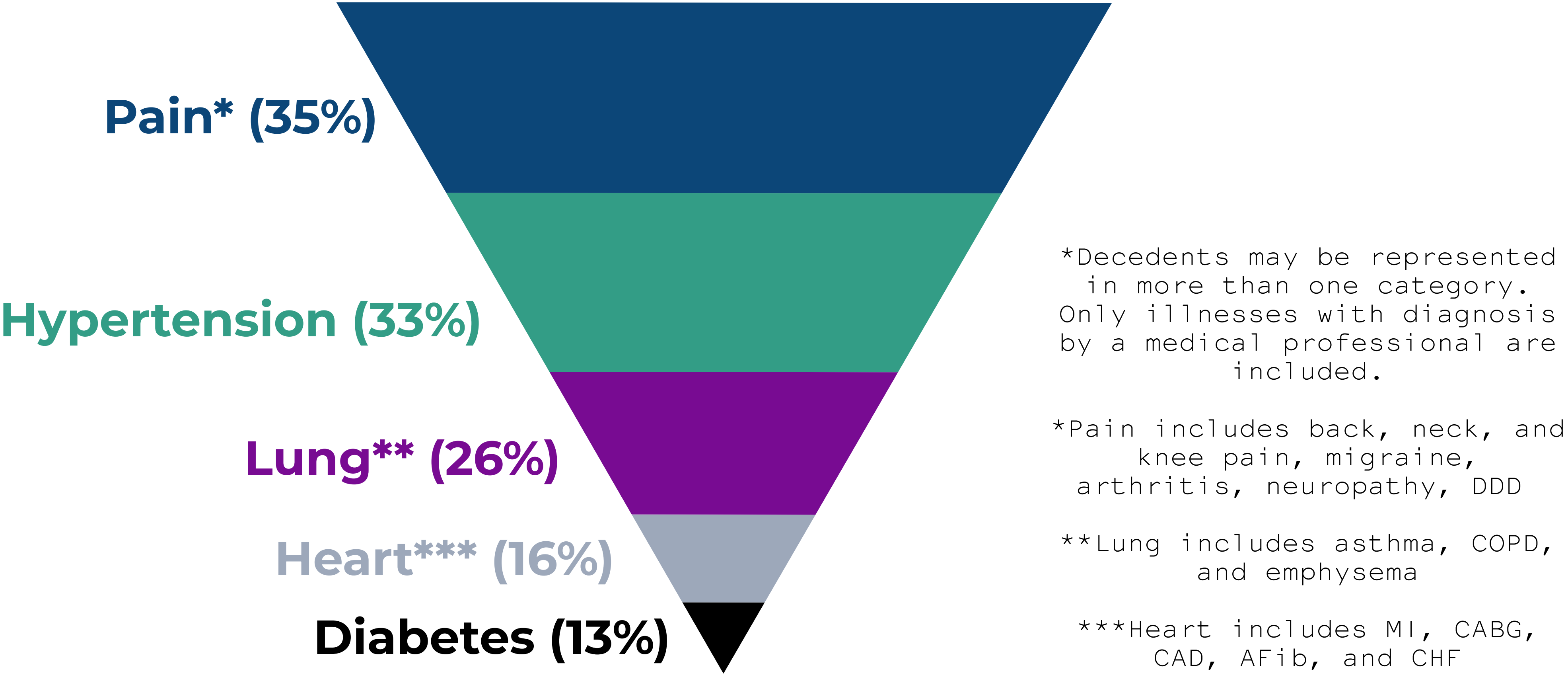
*Asian (n=3), Middle Eastern (n=2), White/American Indian (n=2), Black/Hispanic (n=1), American Indian/Hispanic (n=1)

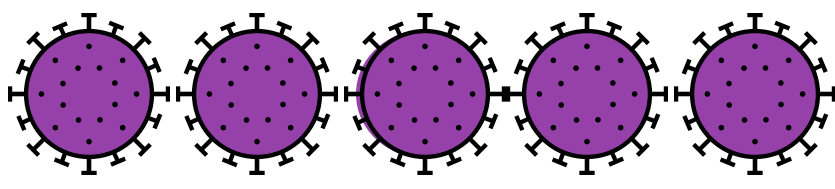
Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

Health Factors

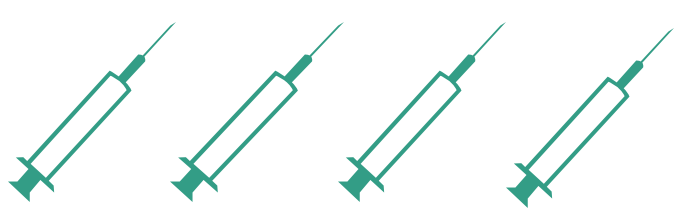
MOST COMMON AILMENTS*






At least **49** decedents were **Hepatitis C** positive

33 of these decedents were known to use **drugs intravenously**




Decedent used tobacco

77%




Decedent drank alcohol

44%



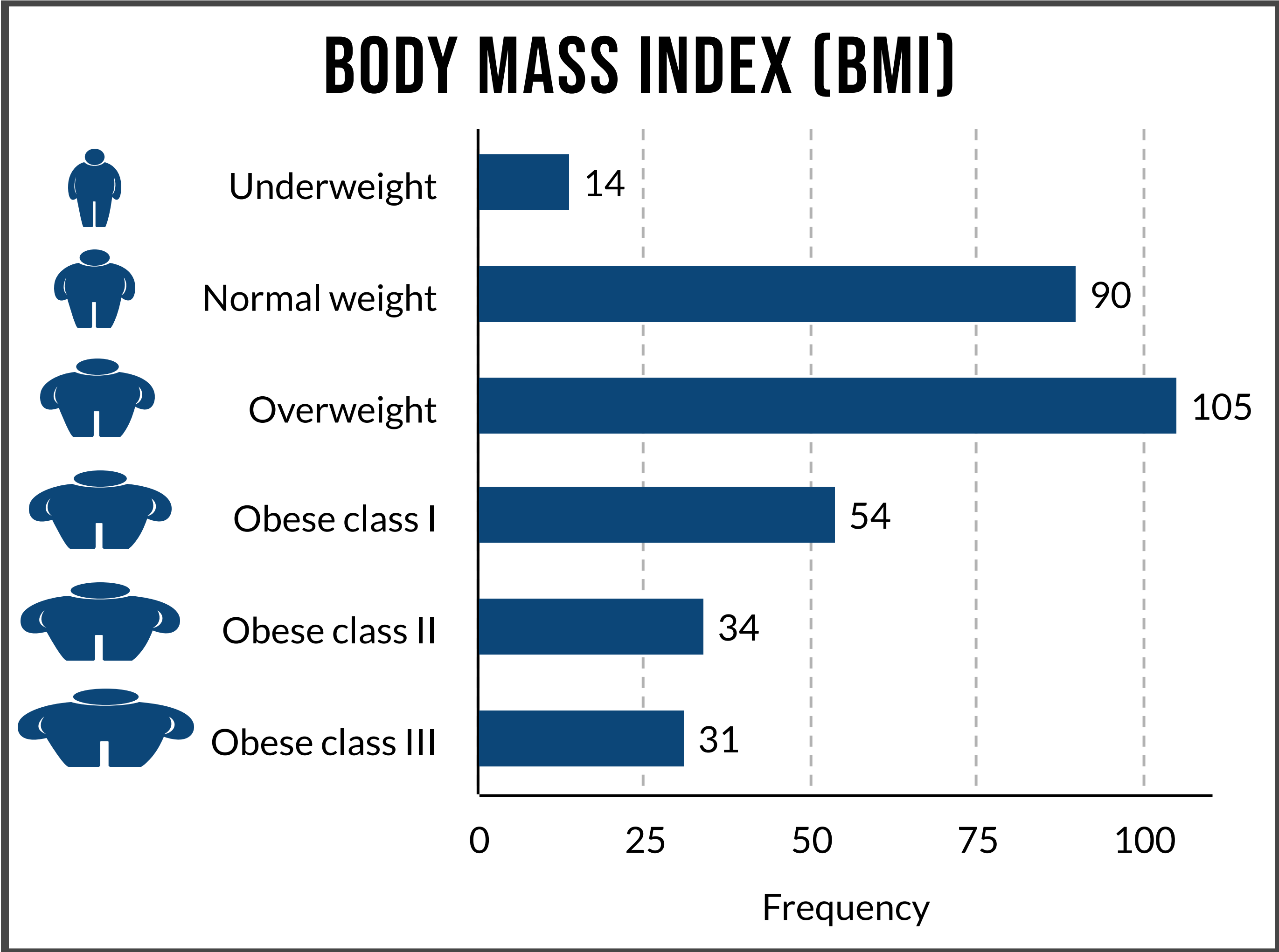
Decedent had a PCP

51%



*Moderate to heavy use

*Primary care physician

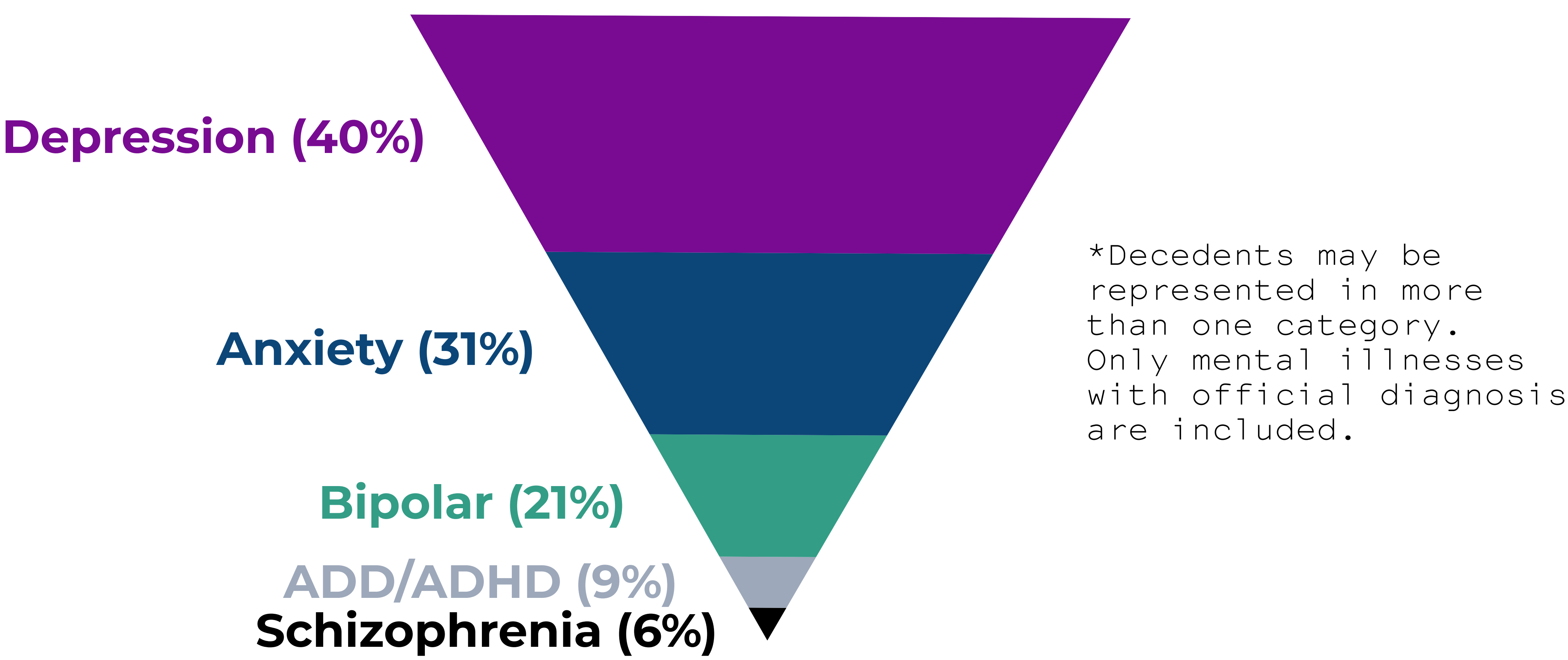


Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

Mental Health Factors

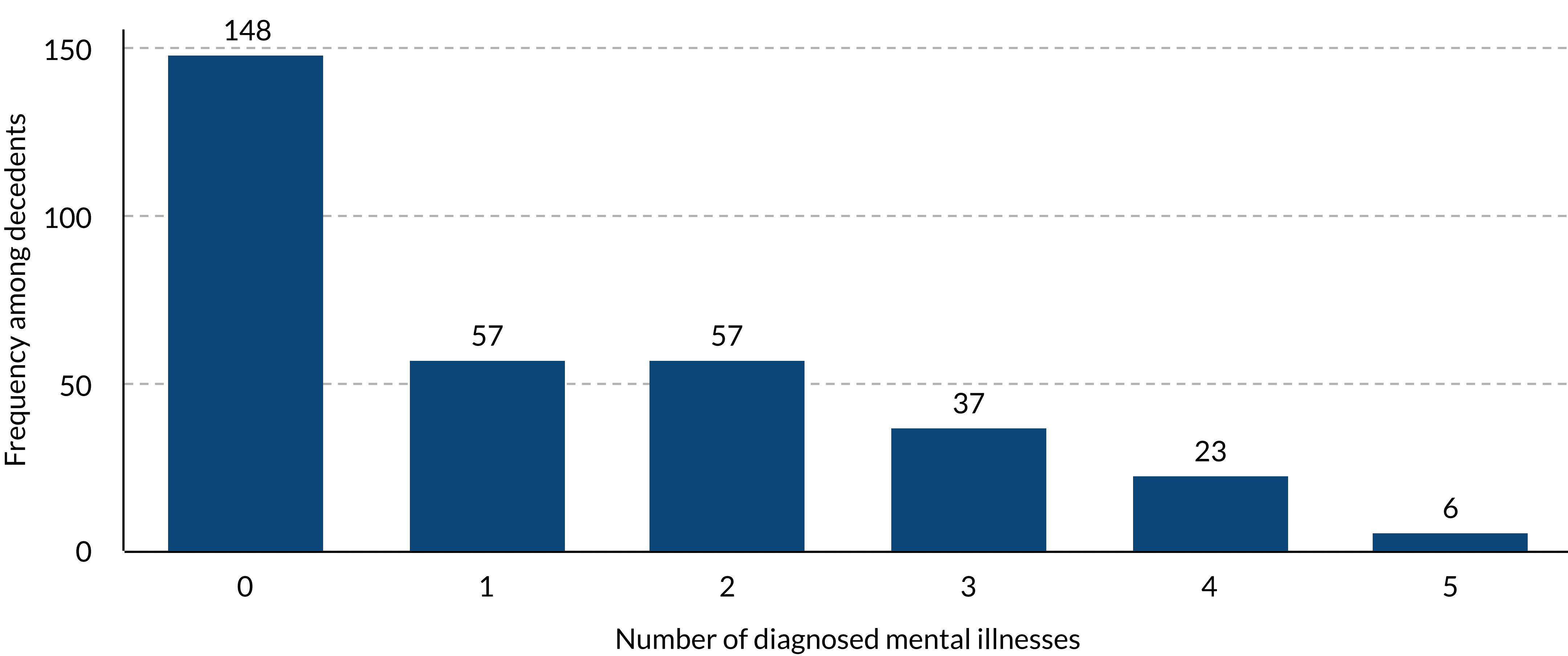
MOST COMMON MENTAL ILLNESSES



PERCENTAGE OF DECEDENTS



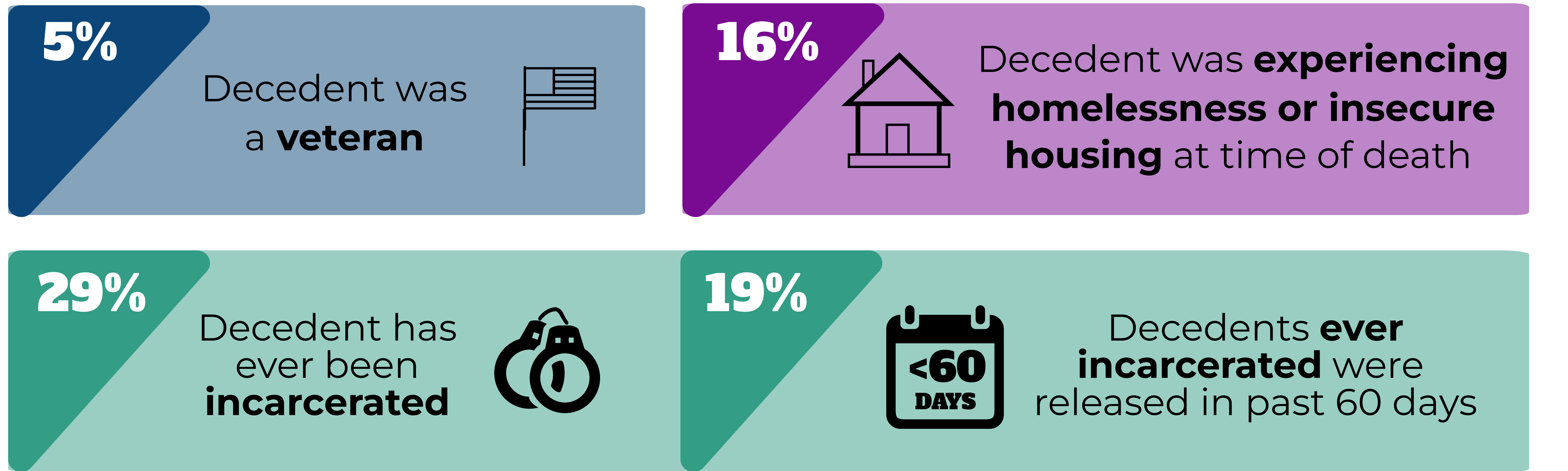
NUMBER OF DIAGNOSED MENTAL ILLNESSES AMONG DECEDENTS



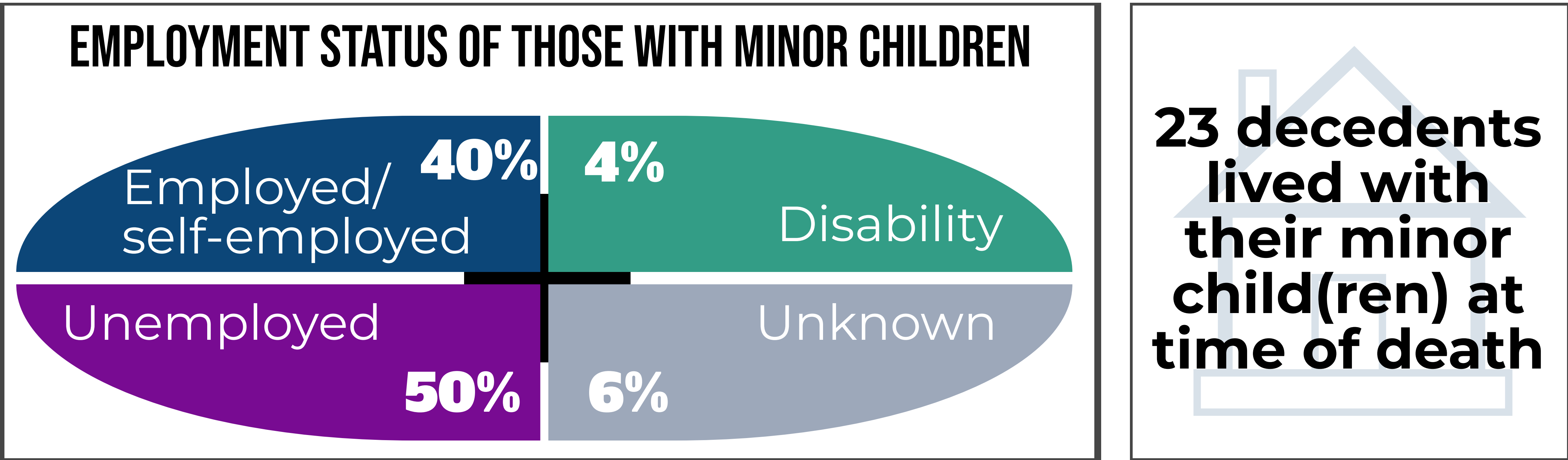
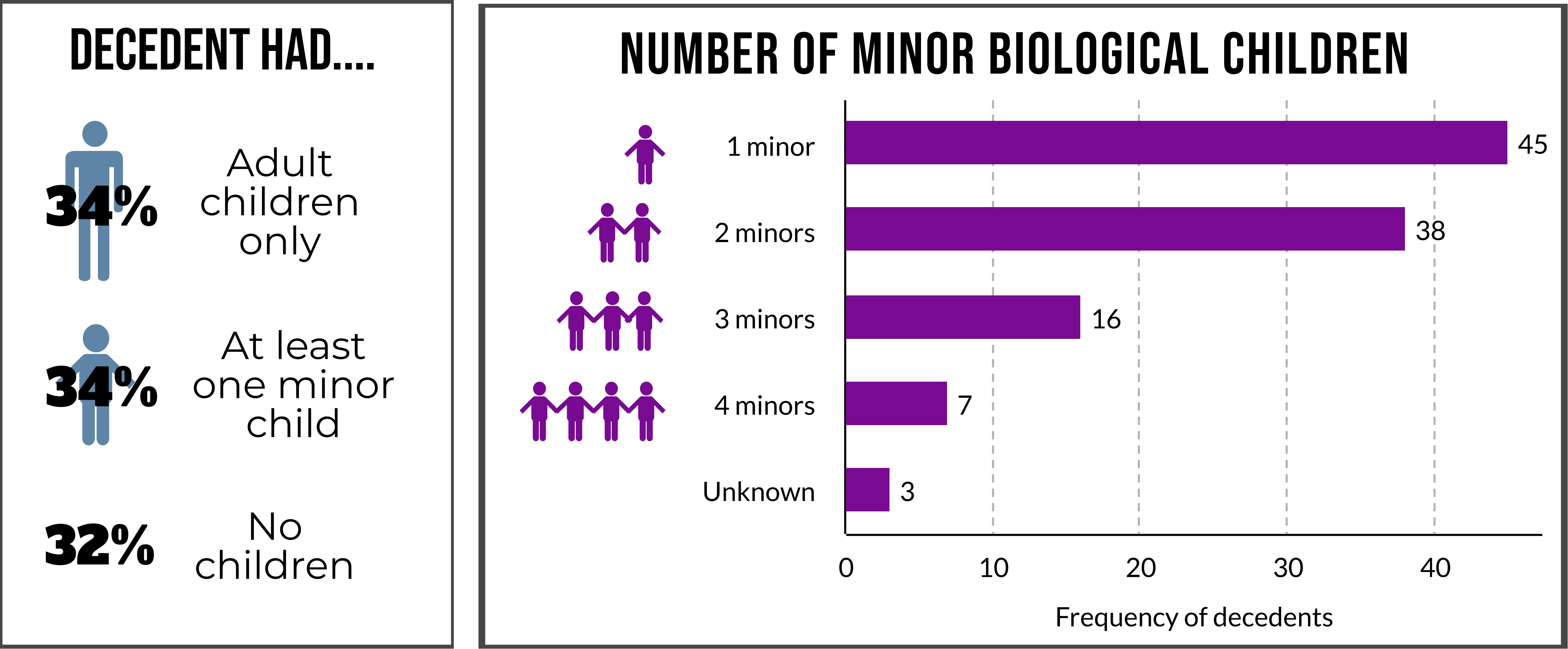
Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

Social Factors



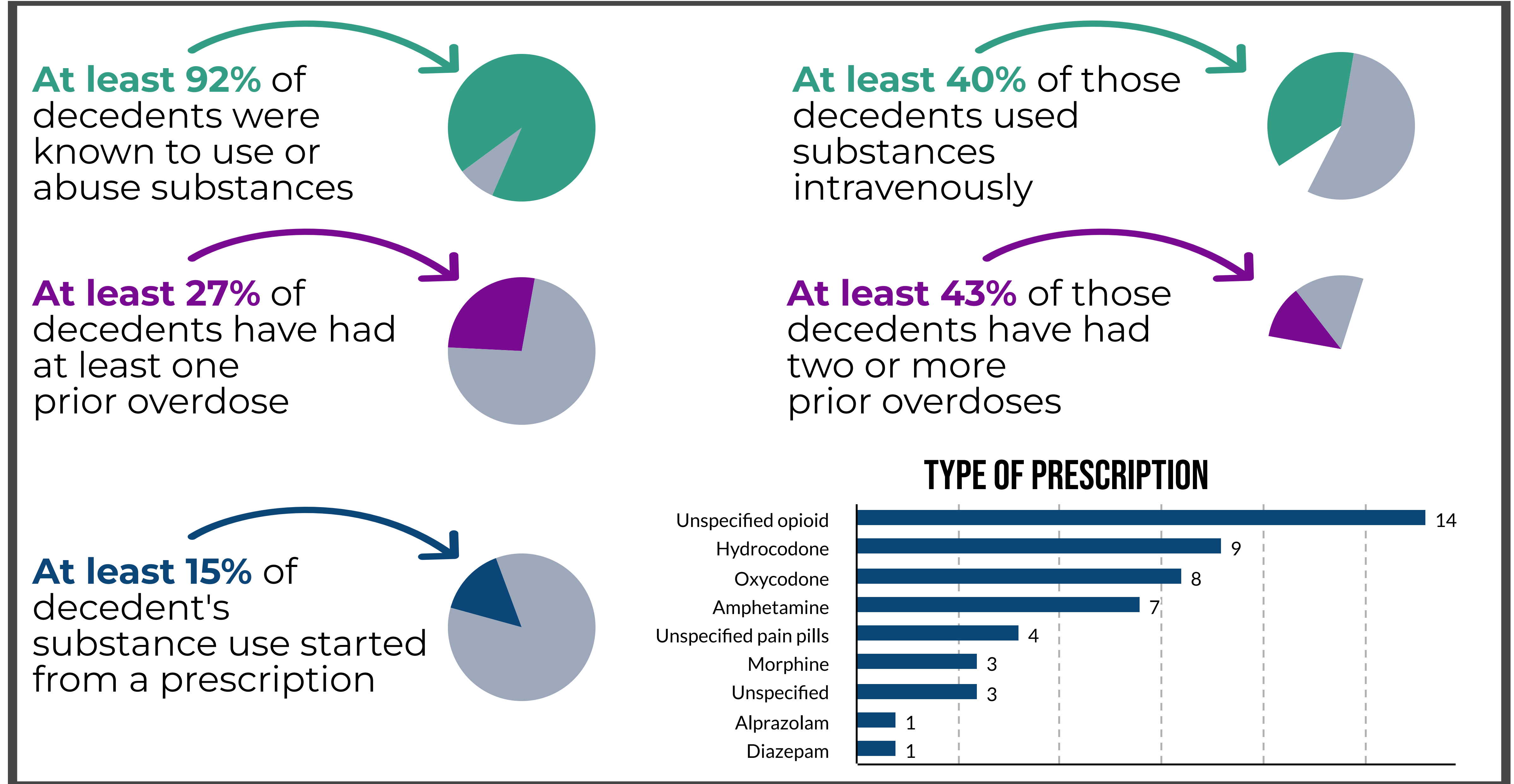
Children



Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

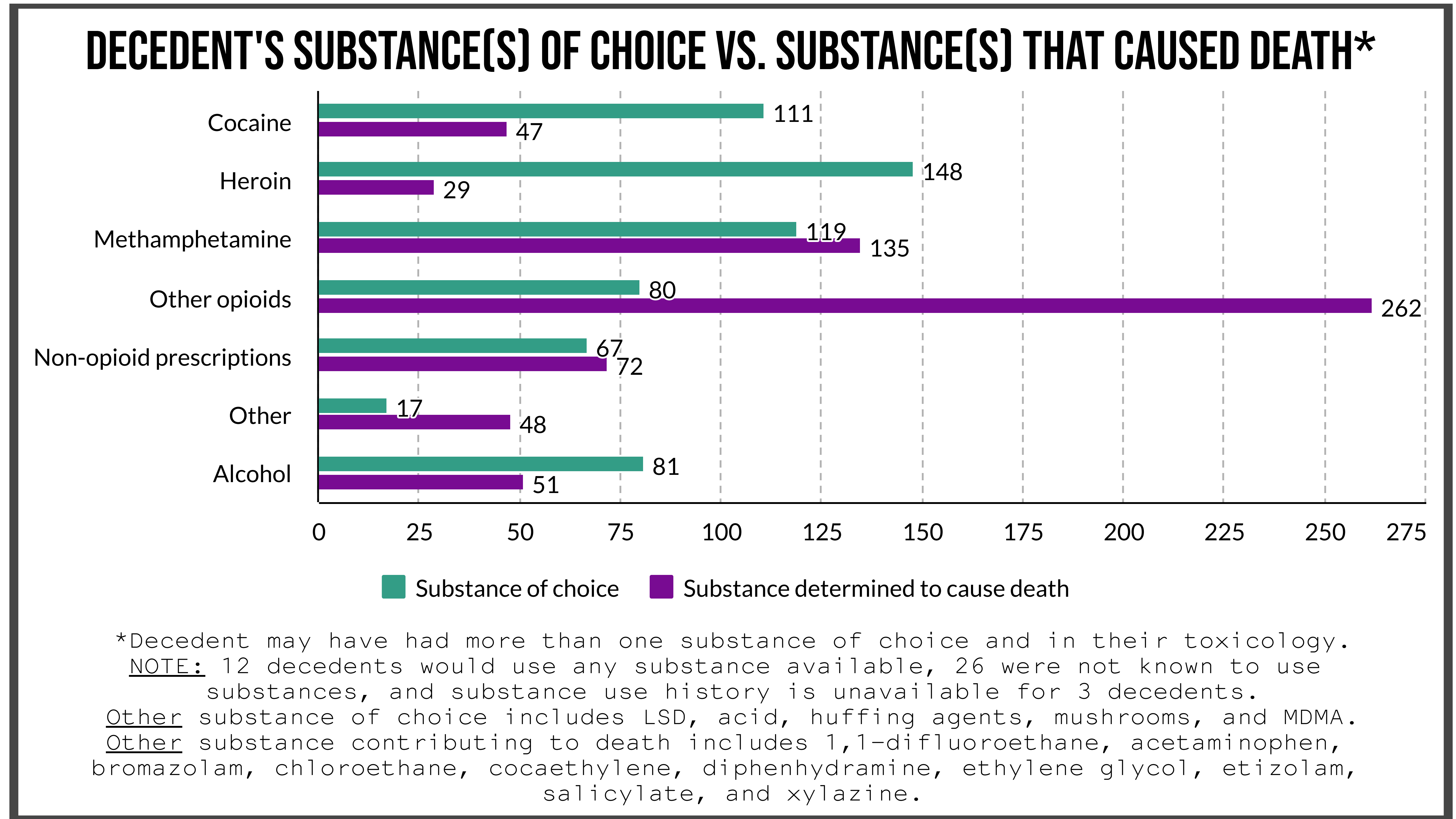
Substance Use History



At least 15% of decedent's substance use started from a prescription

TYPE OF PRESCRIPTION

Unspecified opioid	14
Hydrocodone	9
Oxycodone	8
Amphetamine	7
Unspecified pain pills	4
Morphine	3
Unspecified	3
Alprazolam	1
Diazepam	1



Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

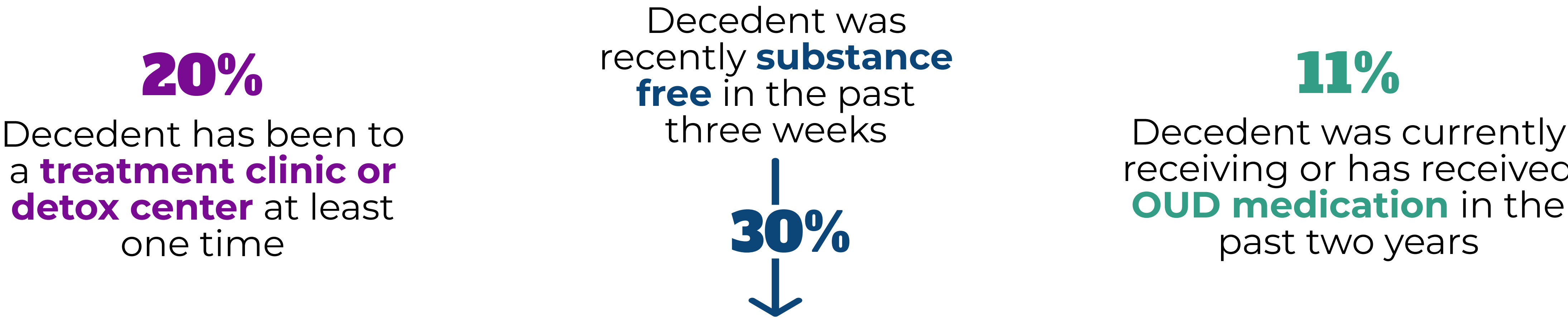
Substance Use History, cont.

PREFERRED METHOD OF ADMINISTRATION (N=299)*

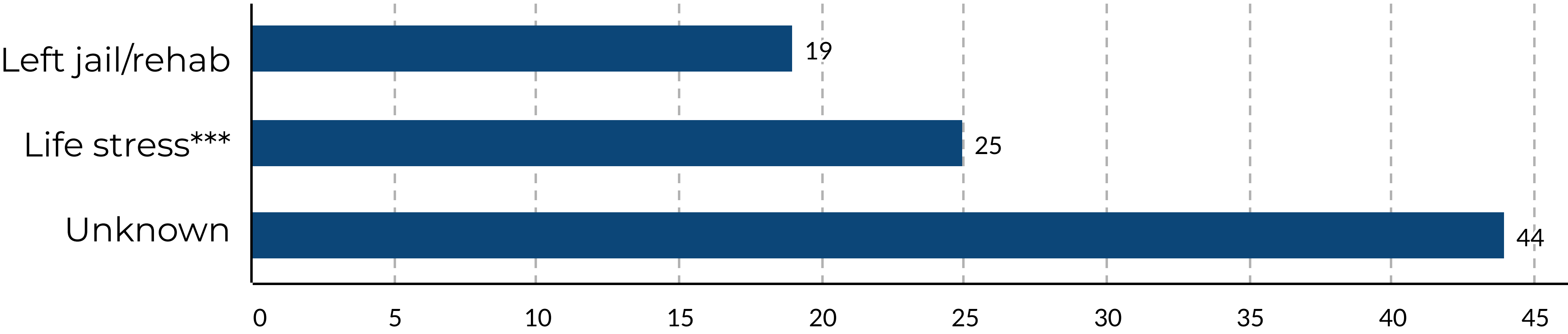
Method	Male (n=199)	Female (n=100)	White (n=226)	Black (n=55)	Hispanic (n=11)	Other** (n=7)	Total (n=299)
Intravenous	84	38	104	10	5	3	121
Snort	70	20	64	23	2	1	90
Smoke	58	26	63	16	1	4	84
Transdermal	0	1	1	0	0	0	1
Huff	3	1	4	0	0	0	4
Oral	37	30	56	9	2	0	67
Unknown	25	12	27	6	3	1	37

*Decedent may have had more than one preferred method of administration. Only includes decedents with a substance use history. **Other race includes Asian (n=2), Middle Eastern (n=2), White/American Indian (n=2), Black/Hispanic (n=1), American Indian/Hispanic (n=1).

RECOVERY HISTORY (N=299)*



SUSPECTED REASON FOR RELAPSE**

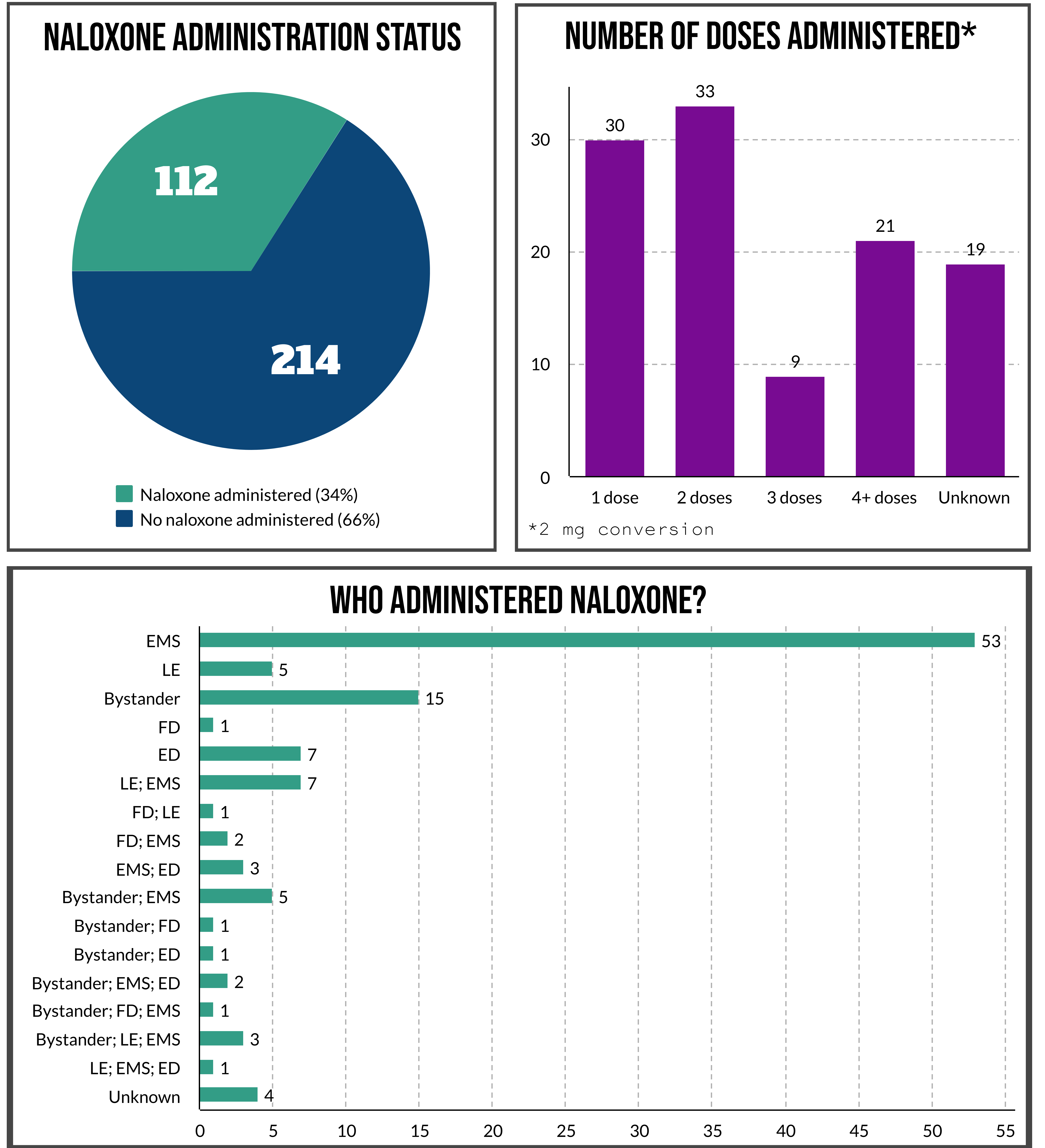


*ONLY Decedents known to use substances are included.
**These factors were mentioned by those close to the decedent for why they may have begun to use substances again after being substances free for at least three weeks.
***Life stress includes recent unemployment, death of loved on, loss of S/O, recent homelessness, social influences, and attempts to stop severe pain.

Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

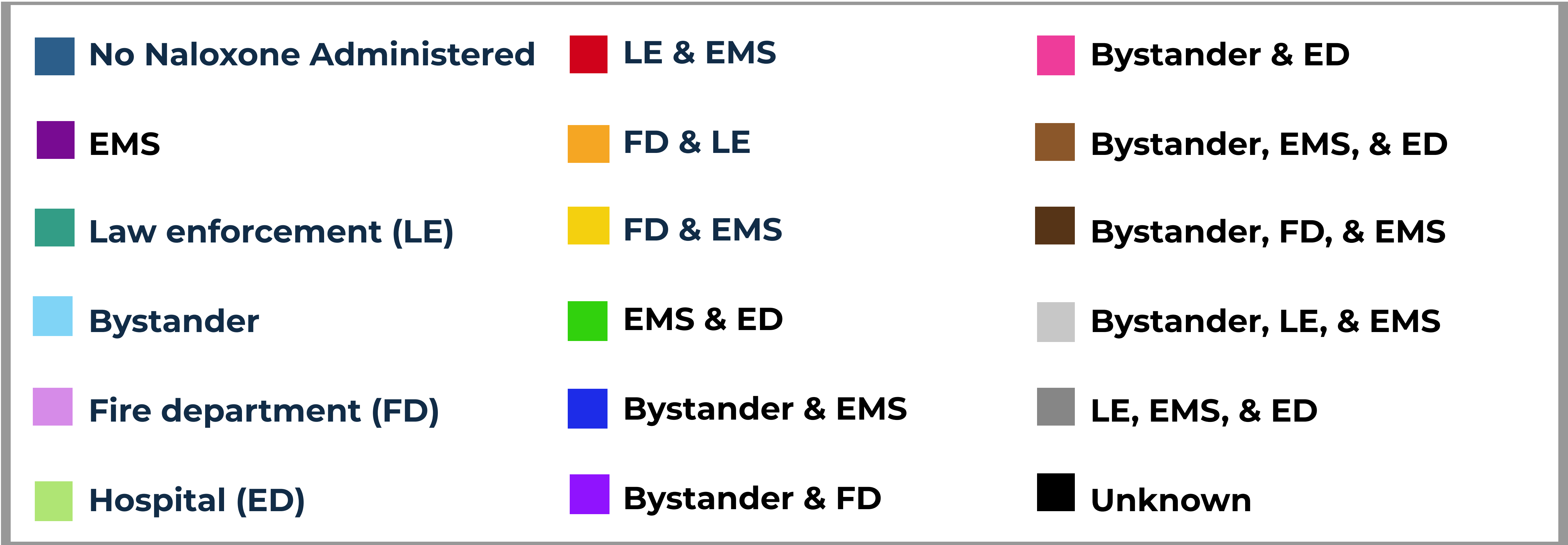
Naloxone Administration



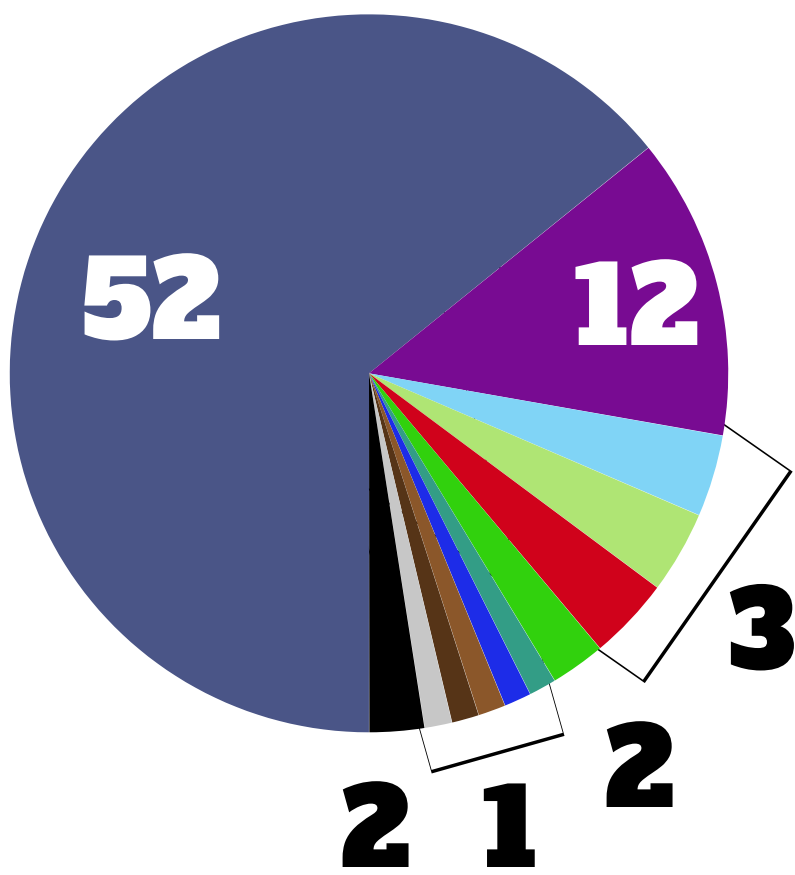
Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

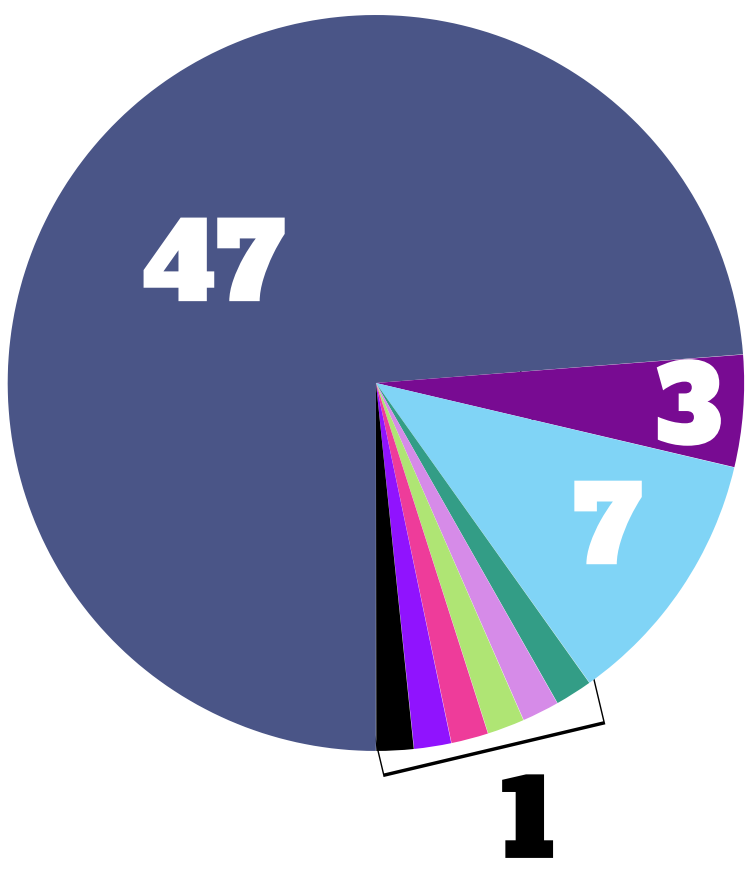
Naloxone Administration, cont.



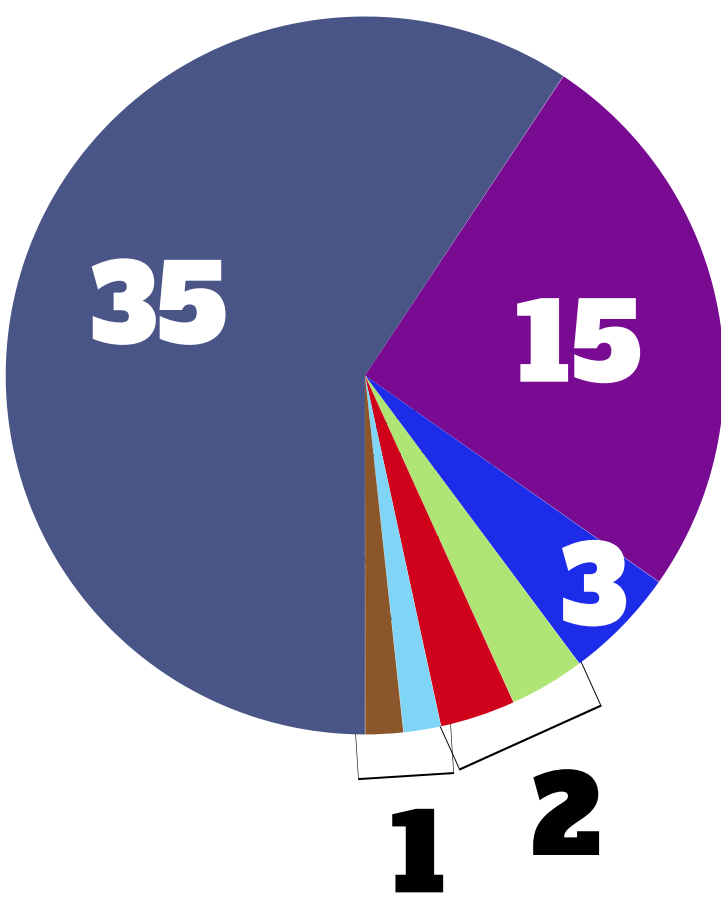
Kalamazoo (n=81)



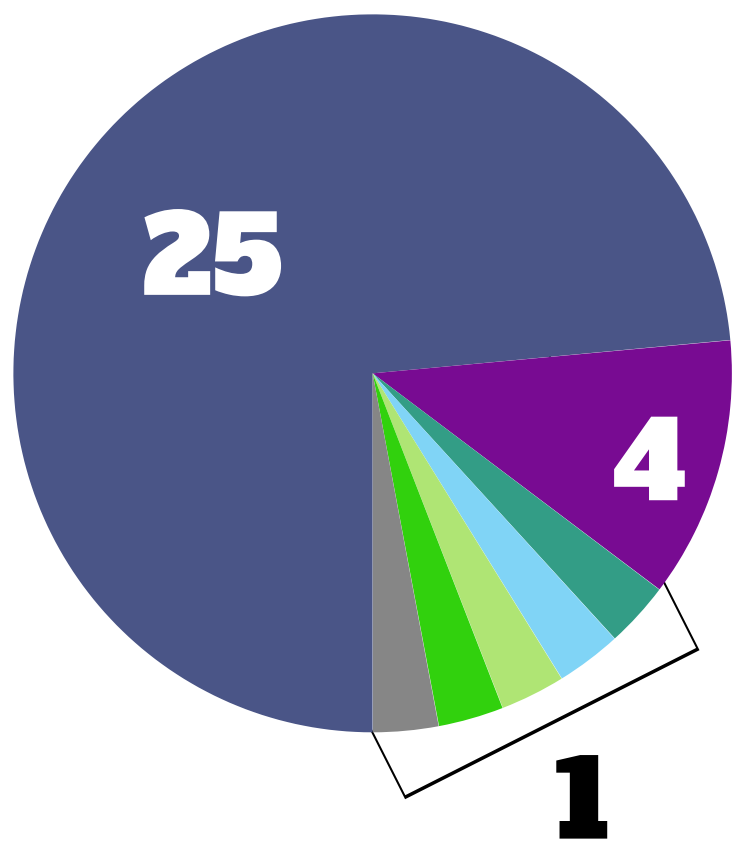
Muskegon (n=61)



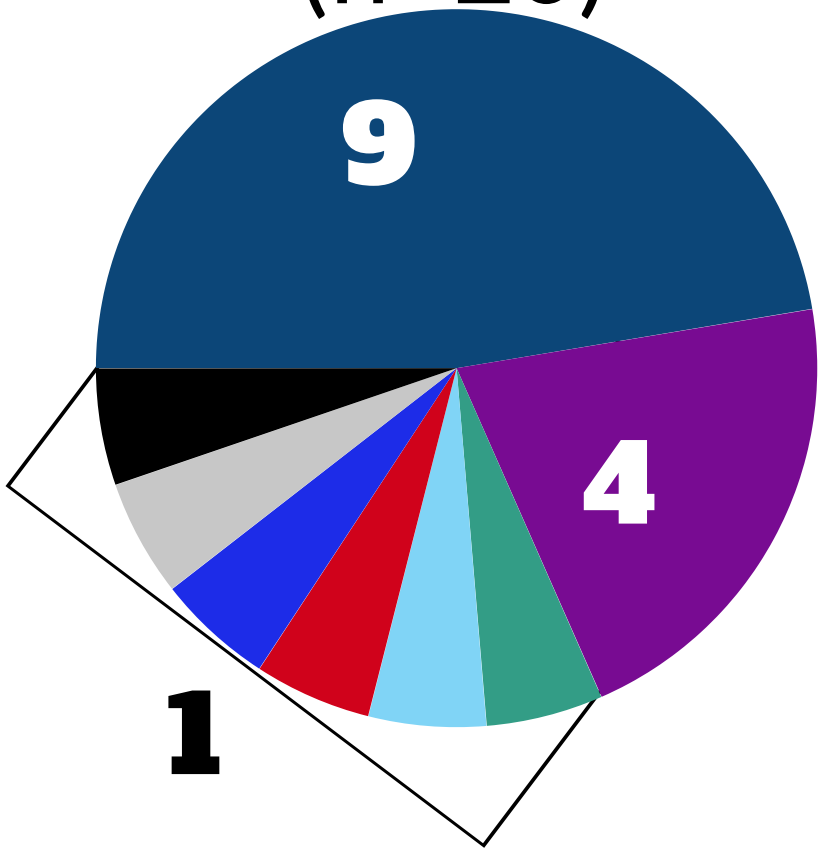
Calhoun (n=59)



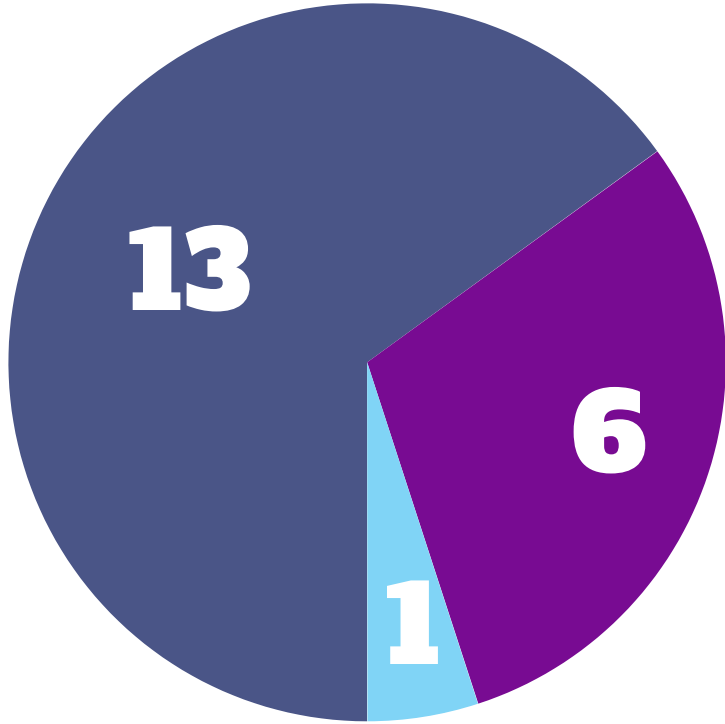
Berrien (n=34)



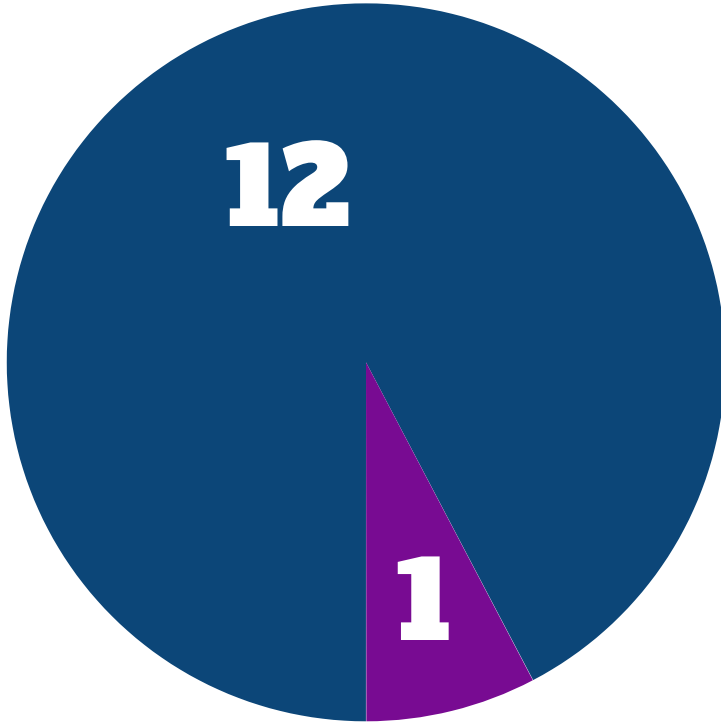
Grand Traverse (n=20)



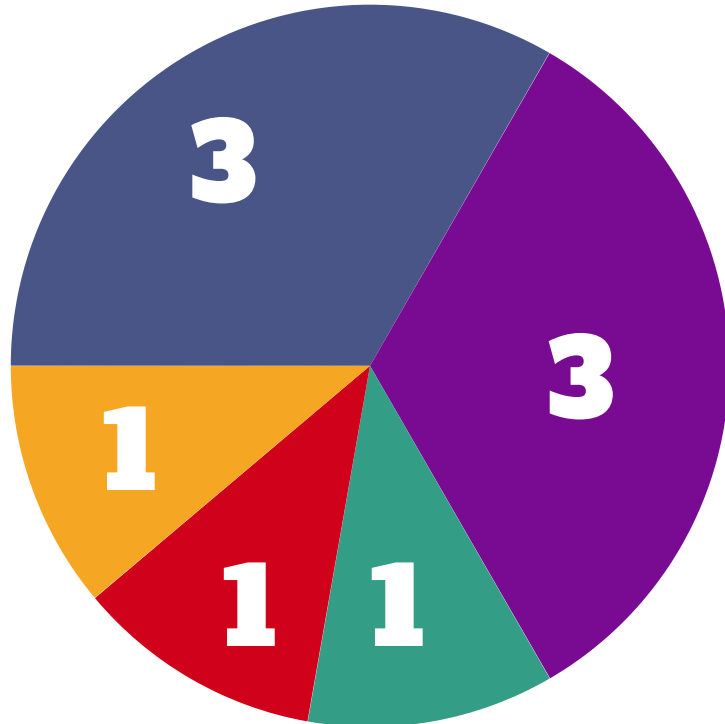
Van Buren (n=20)



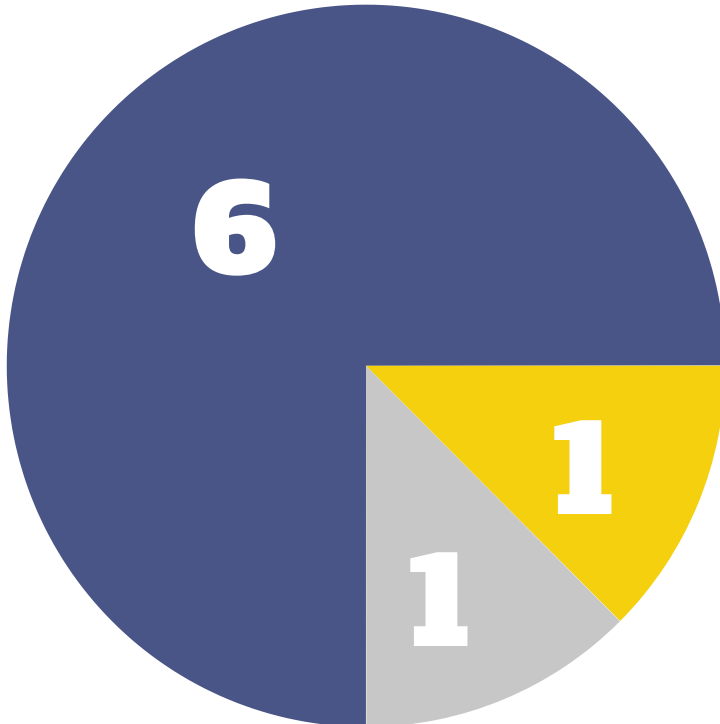
Allegan (n=13)



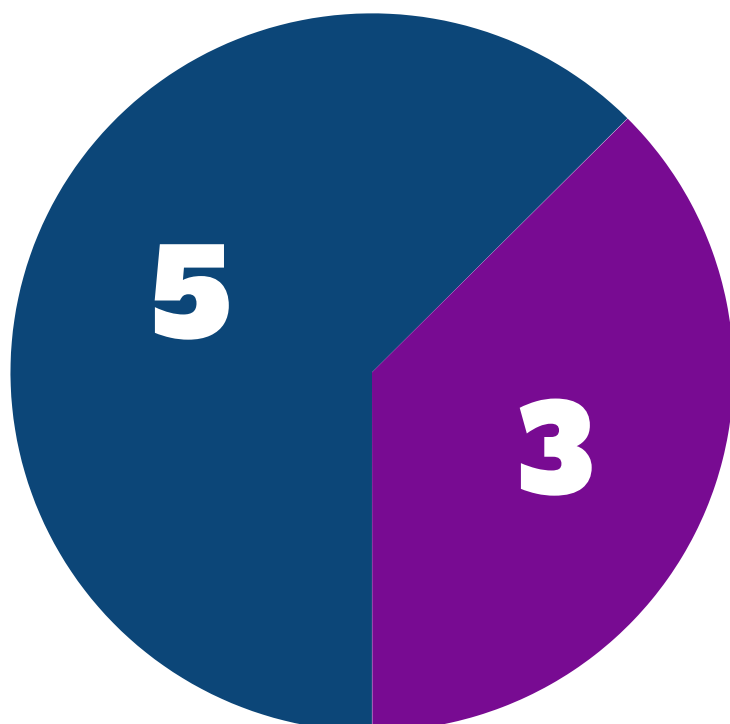
Cass (n=9)



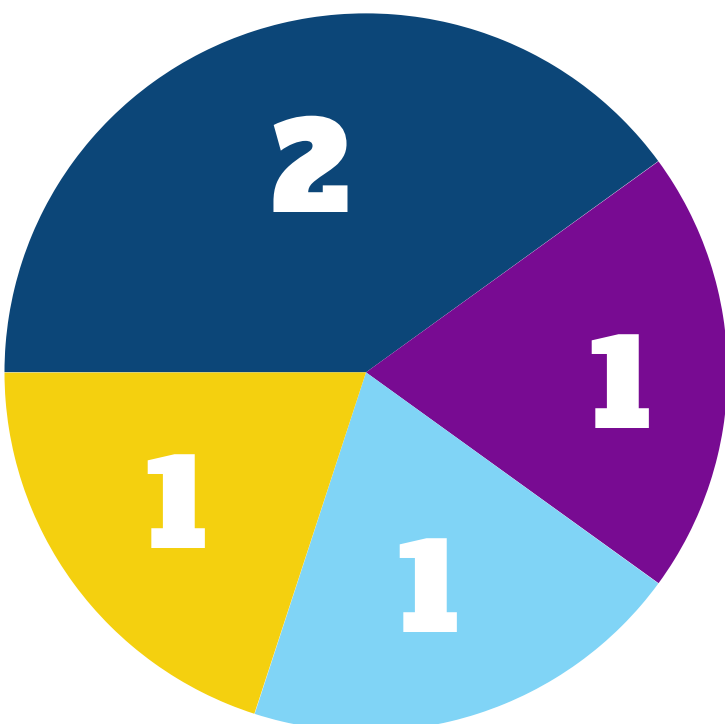
Mason (n=8)



St. Joseph (n=8)



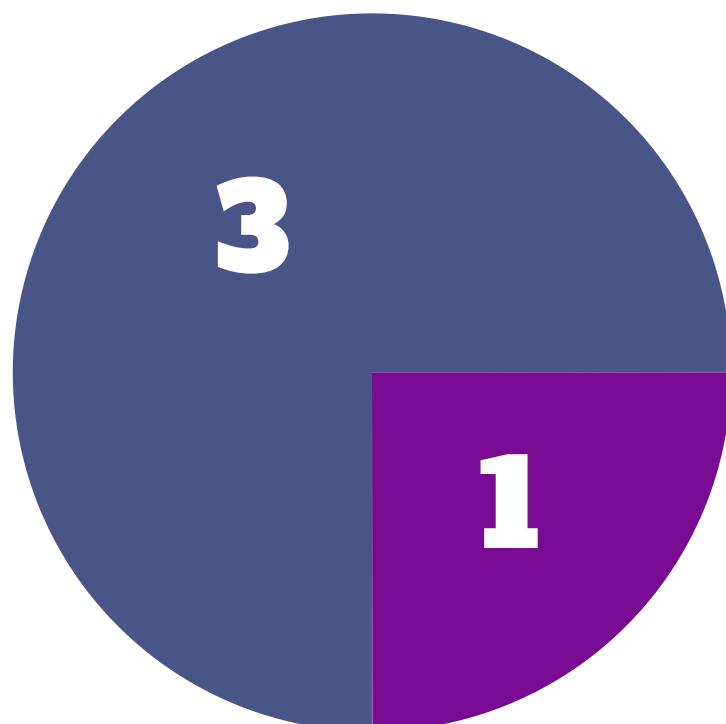
Osceola (n=5)



Barry (n=4)



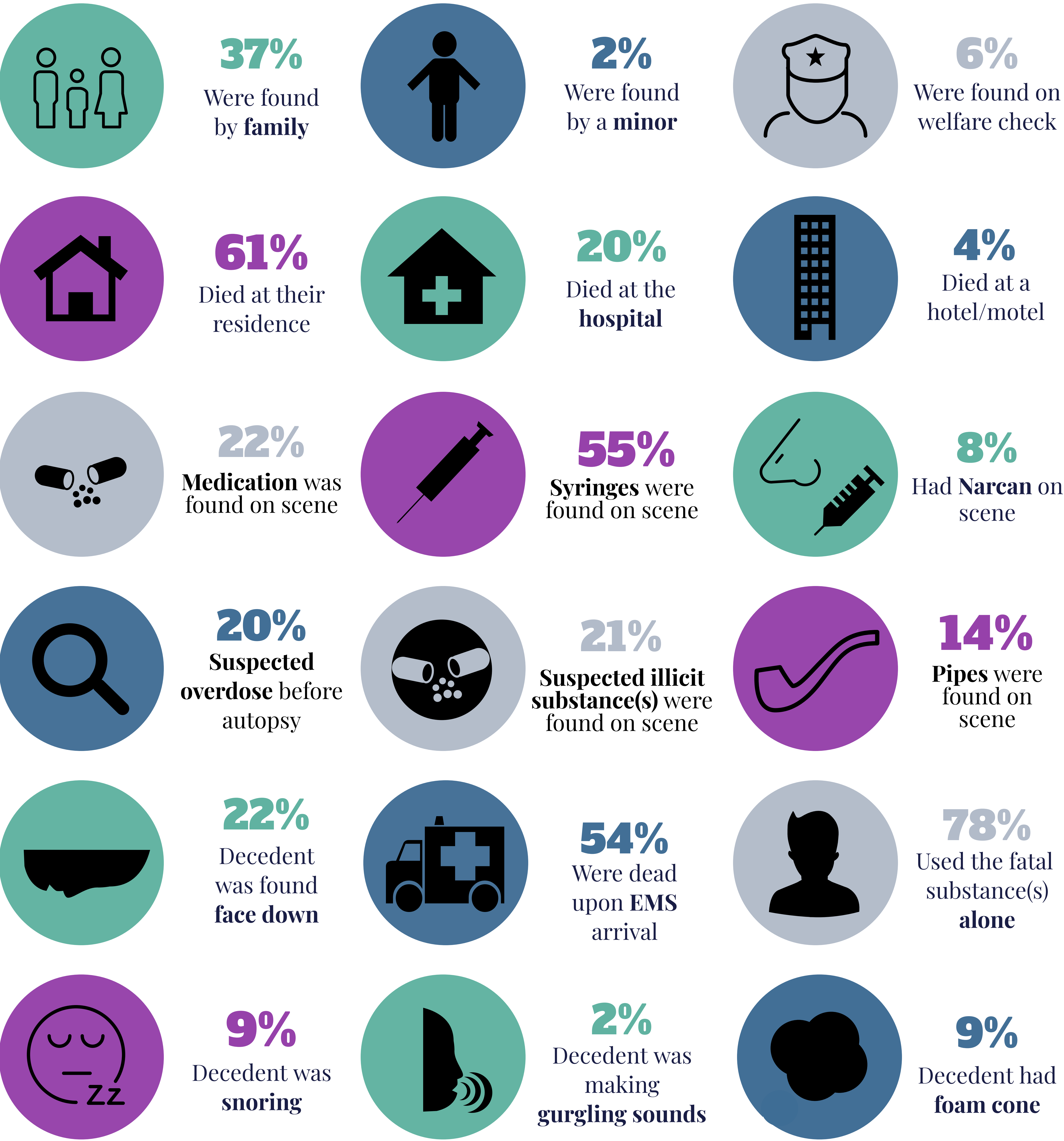
Leelanau (n=4)



Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

Death Scene Findings

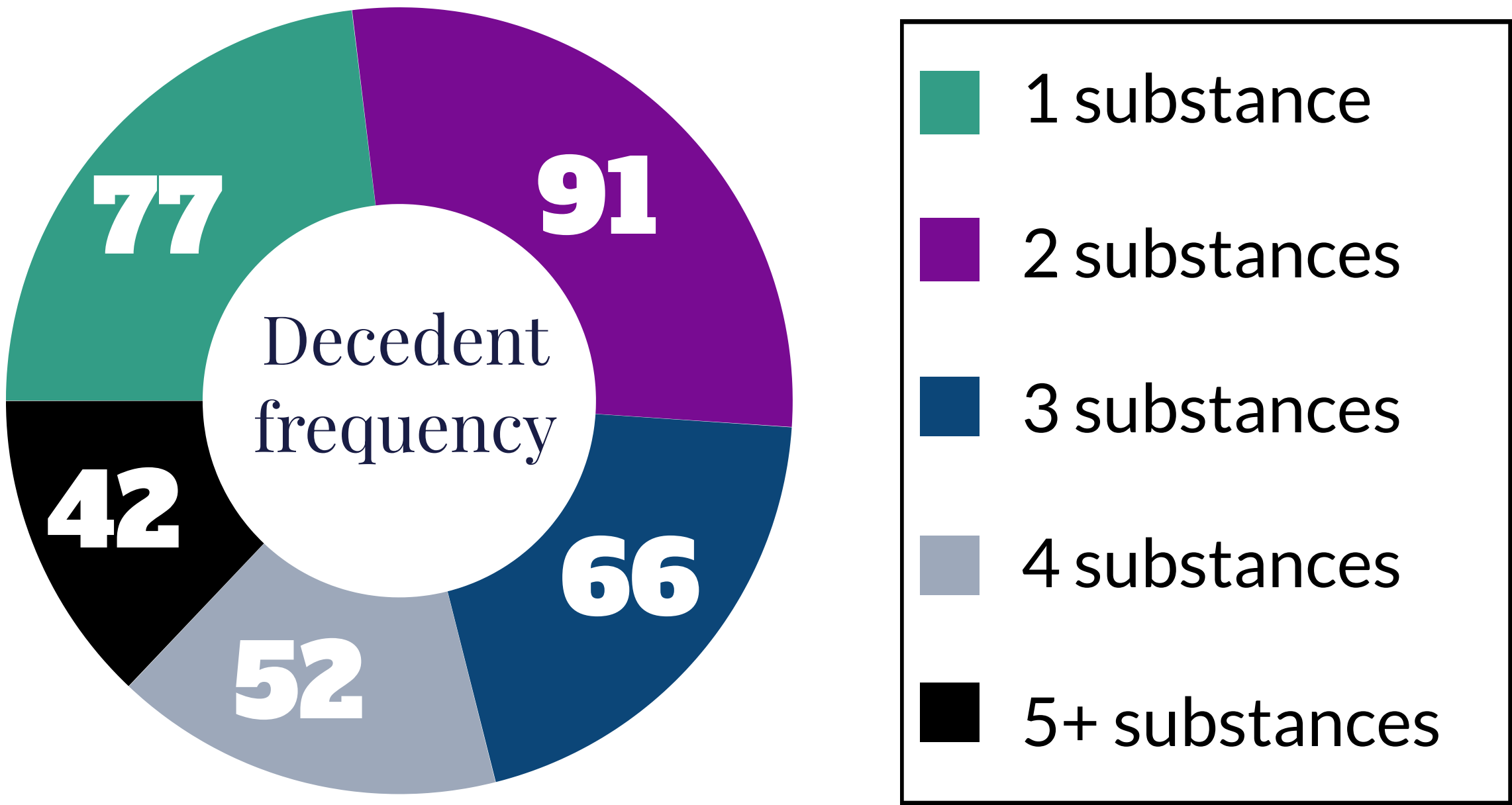


Deaths Related to Opioids and Other Drugs

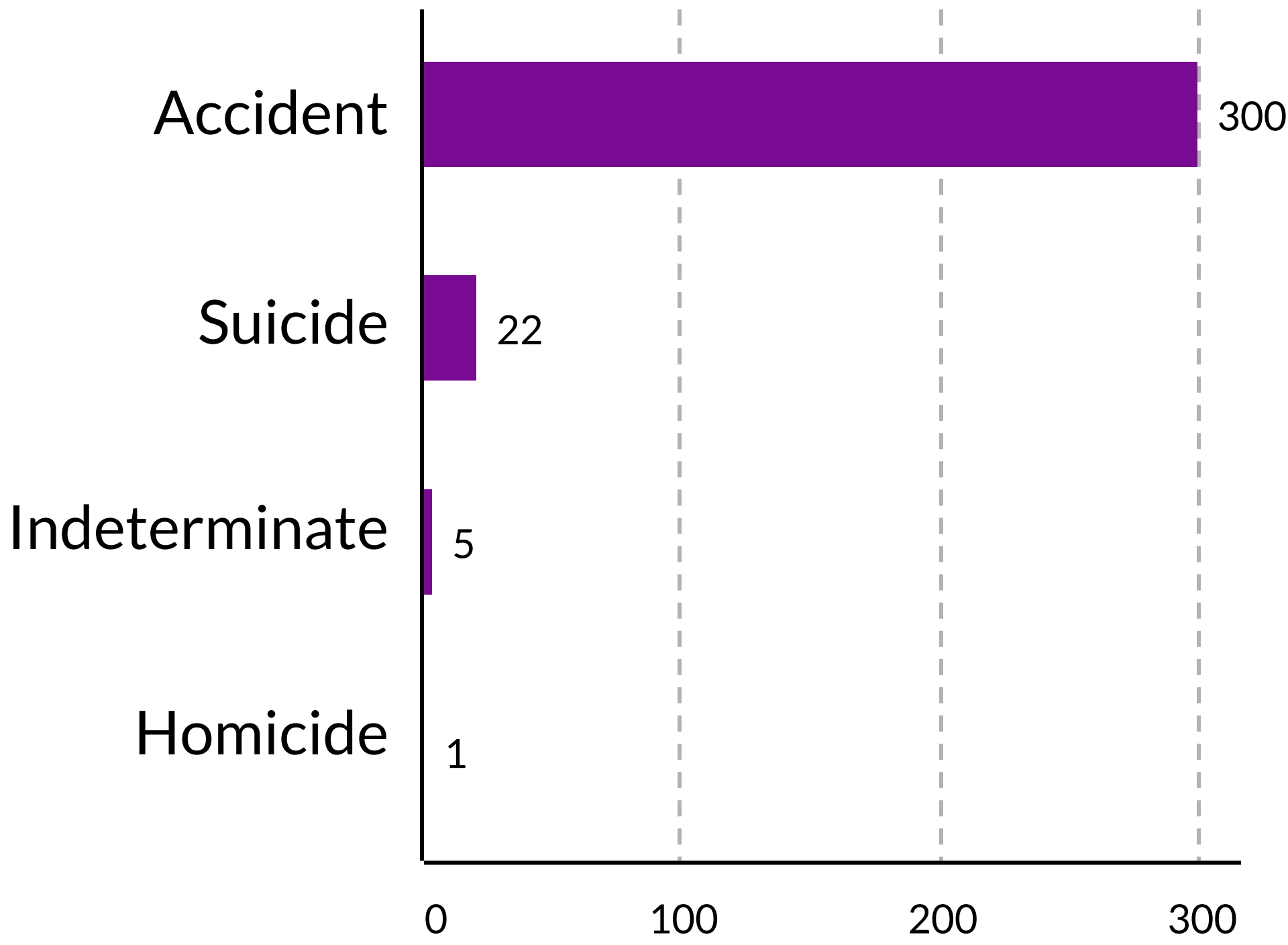
Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

Autopsy and Toxicology Results

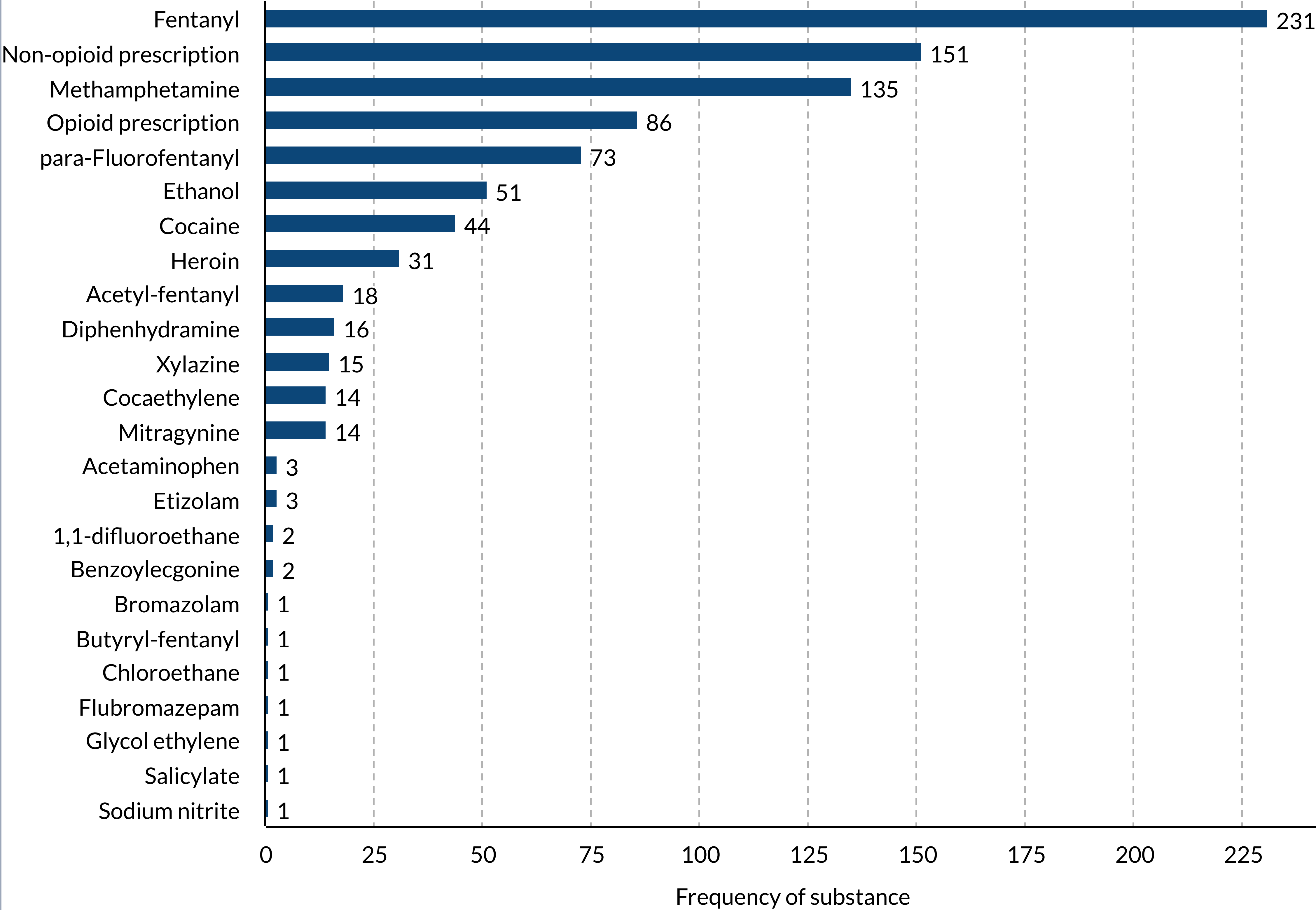
NUMBER OF SUBSTANCES
CONTRIBUTING TO DEATH



MANNER OF DEATH



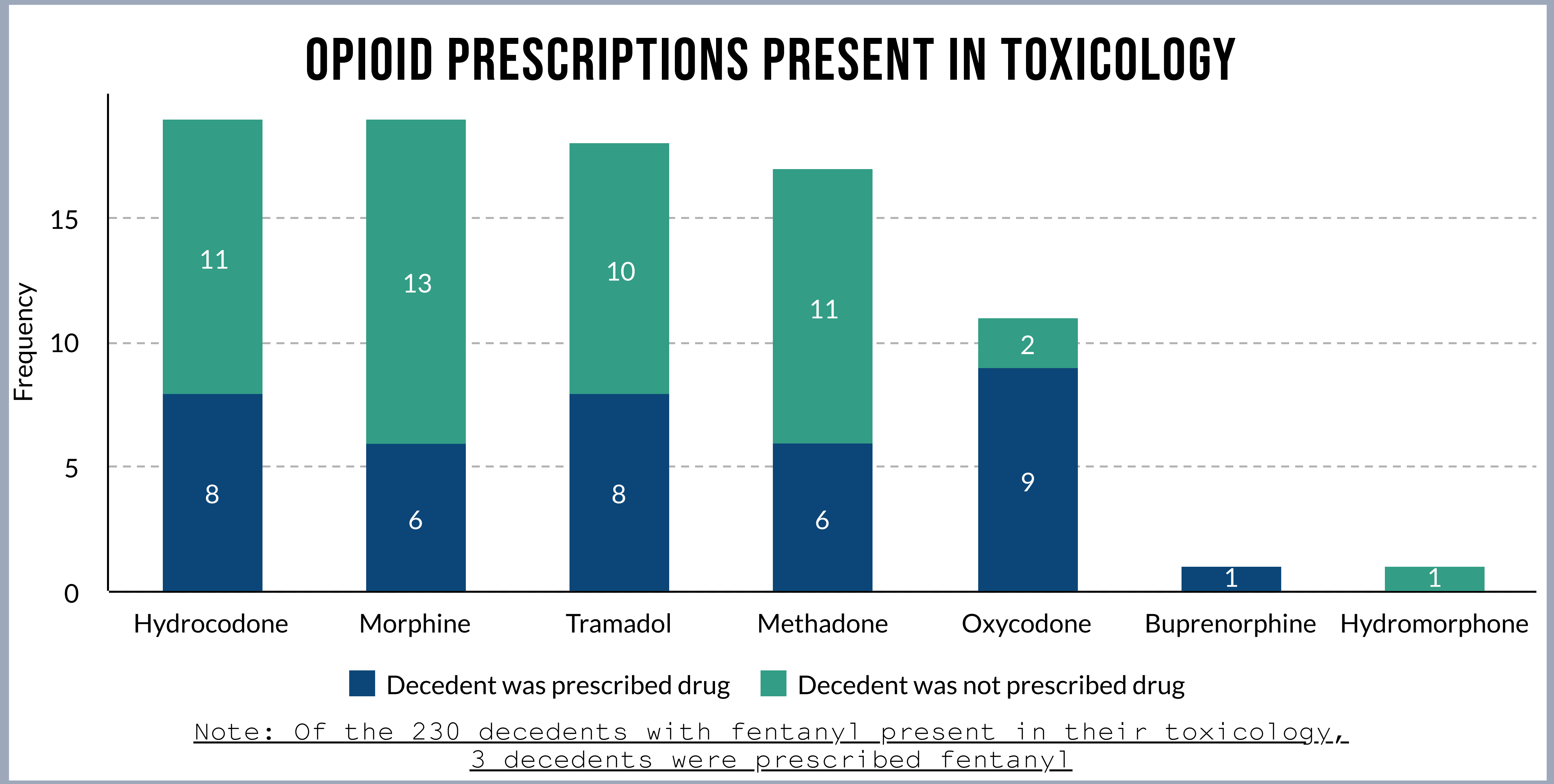
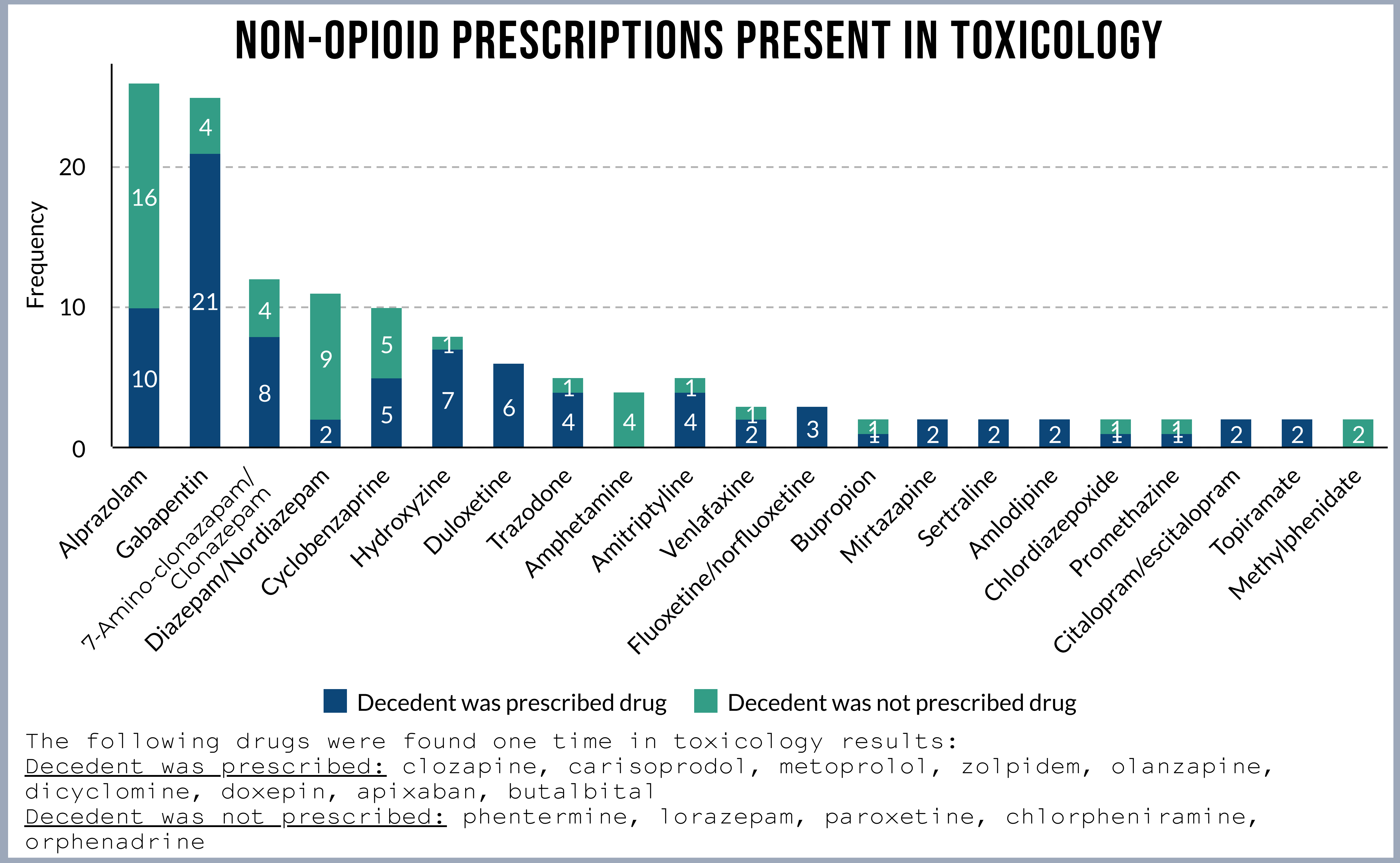
SUBSTANCES CONTRIBUTING TO DEATH



Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

Autopsy and Toxicology Results, cont.



Deaths Related to Opioids and Other Drugs

Allegan, Barry, Berrien, Calhoun, Cass, Grand Traverse, Kalamazoo, Leelanau, Mason, Muskegon, Osceola, St. Joseph, & Van Buren County

Highlights

OPIOIDS AND POSITIONAL ASPHYXIA

26% (68 of 263) of decedents who died of an opioid were originally found in a potentially airway asphyxiating position

These positions include decedent **drowning** or decedent found **face down on the floor, their bed, or on another surface**

6% (4 of 65) of decedents who died of a non-opioid were originally found in a potentially airway asphyxiating position

Opioids depress the respiratory system and when coupled with positional asphyxia, there may be an increase risk of death. This MEO suggests that those who use substances not use alone and to ensure they are not at risk for slumping forward onto their face.

DECEDENT'S HOUSING STATUS AND METHAMPHETAMINE USE

63% of decedents without stable housing had methamphetamine contribute to their overdose

37% of decedents with stable housing had methamphetamine contribute to their overdose

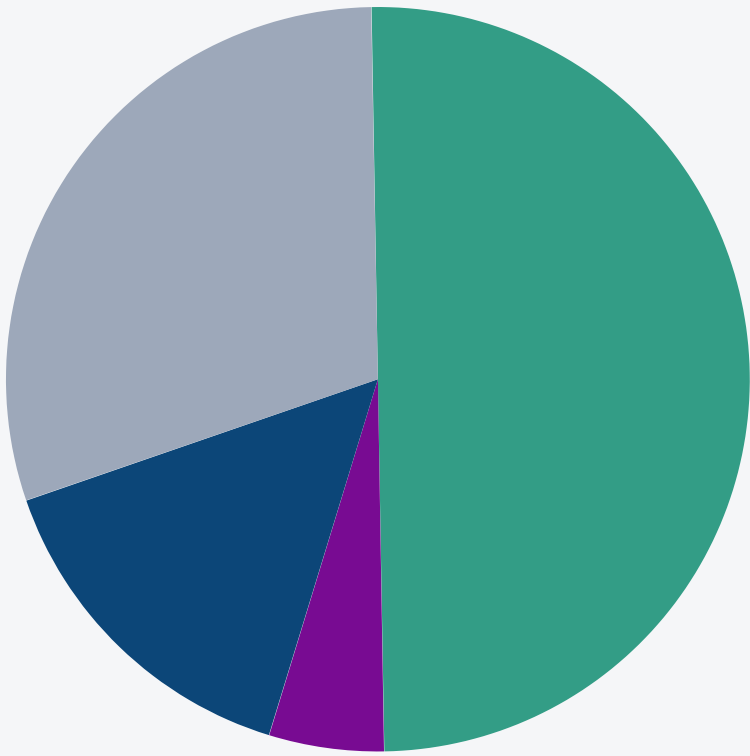
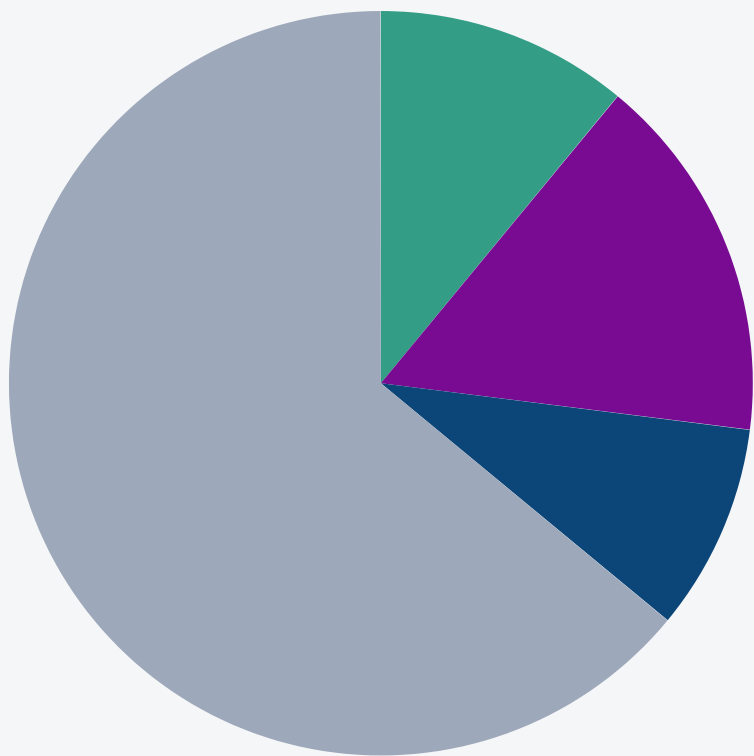
DECEDENT'S PRESCRIPTION STATUS AND MANNER OF DEATH

36% of decedents whose death was ruled an accident had prescription medication contributing to death

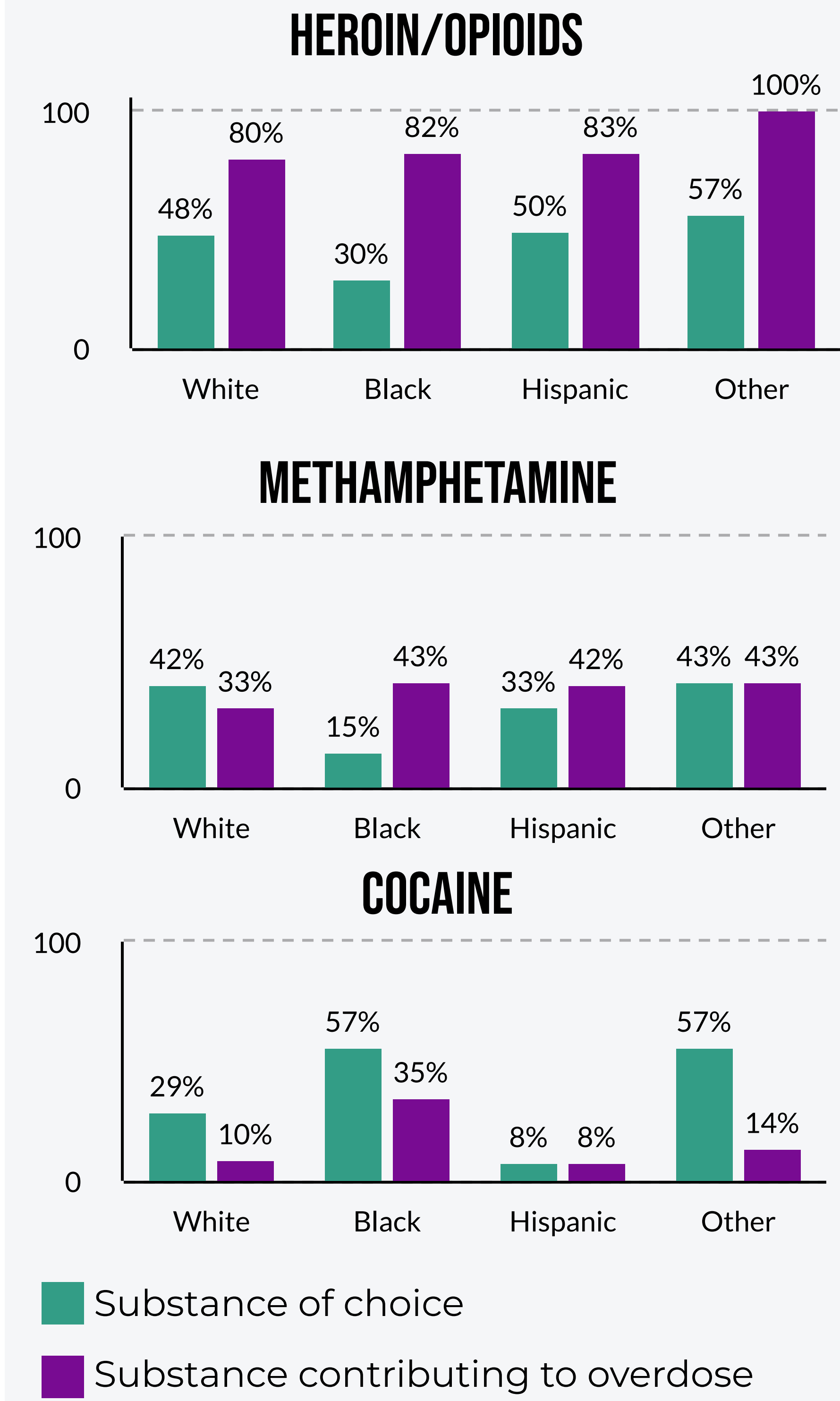
11% had prescriptions for those medications
16% did not have prescriptions for those medications
9% had prescriptions for some medications but not for others

70% of decedents whose death was ruled a suicide had prescription medication contributing to death

50% had prescriptions for those medications
5% did not have prescriptions for those medications
15% had prescriptions for some medications but not for others



SUBSTANCE OF CHOICE VS SUBSTANCE CONTRIBUTING TO DEATH BY RACE



Deaths related to opioids and other drugs

Annual Report 2021

Leelanau, Mason, & Osceola County

This report is in memory of those who lost their life or a loved one to substance use. These losses must motivate us all to prevent future deaths.

Purpose: This data was collected by the Office of the Medical Examiner (MEO) in the Department of Pathology at Western Michigan University Homer Stryker M.D. School of Medicine (WMed). Unless otherwise noted, data is from 2021 and includes deaths where drugs were the immediate cause of death. This report is meant to provide up to date statistics to those involved in efforts to reduce the number of drug-related deaths.

Sections with the following headings are approximations and frequencies may be higher than what is reported: Health Factors, Mental Health Factors, Social Factors, Children and Substance Use History.

Sources: All data was extracted from a Medical Examiner database, law enforcement (LE) reports, EMS runsheets, death certificates, obituaries, medical records, toxicology reports, and autopsy reports.

Note: Leelanau, Mason, and Osceola counties are combined to protect decedents' identities due to low count numbers ($n < 10$) in each county.

B=Black/African-American; W=White; F=Female; M=Male

Please email questions to pathology@med.wmich.edu

Office of the Medical Examiner
Department of Pathology
Homer Stryker M.D. School of Medicine

Deaths Related to Opioids and Other Drugs

Mason, Leelanau, & Osceola County

All drug-related deaths: Leelanau

Age	Race	Sex	Death certificate: Substances contributing to death	Injury zip code
33	W	M	fentanyl	49654
38	W	M	ethanol, hydroxyzine, nordiazepam	49670
41	W	M	acetyl-fentanyl, diphenhydramine, fentanyl, methadone, methamphetamine, morphine	49682
60	W	M	diphenhydramine, fentanyl	49664

All drug-related deaths: Mason

Age	Race	Sex	Death certificate: Substances contributing to death	Injury zip code
27	W	F	amitriptyline, citalopram, fluoxetine, mirtazapine, topiramate	49431
28	W	M	fentanyl, methamphetamine	49454
35	W	M	alprazolam, fentanyl, methamphetamine, mitragynine, para-fluorofentanyl	49431
35	W	M	cocaine, fentanyl, methamphetamine	Unknown
36	W	M	fentanyl, methamphetamine, para-fluorofentanyl	49431
38	W	F	buprenorphine, bupropion, methamphetamine, venlafaxine	49431
57	W	F	7-aminoclonazepam, acetyl-fentanyl, cocaine, fentanyl	49431
69	W	F	diphenhydramine, duloxetine, oxycodone, topiramate	49449

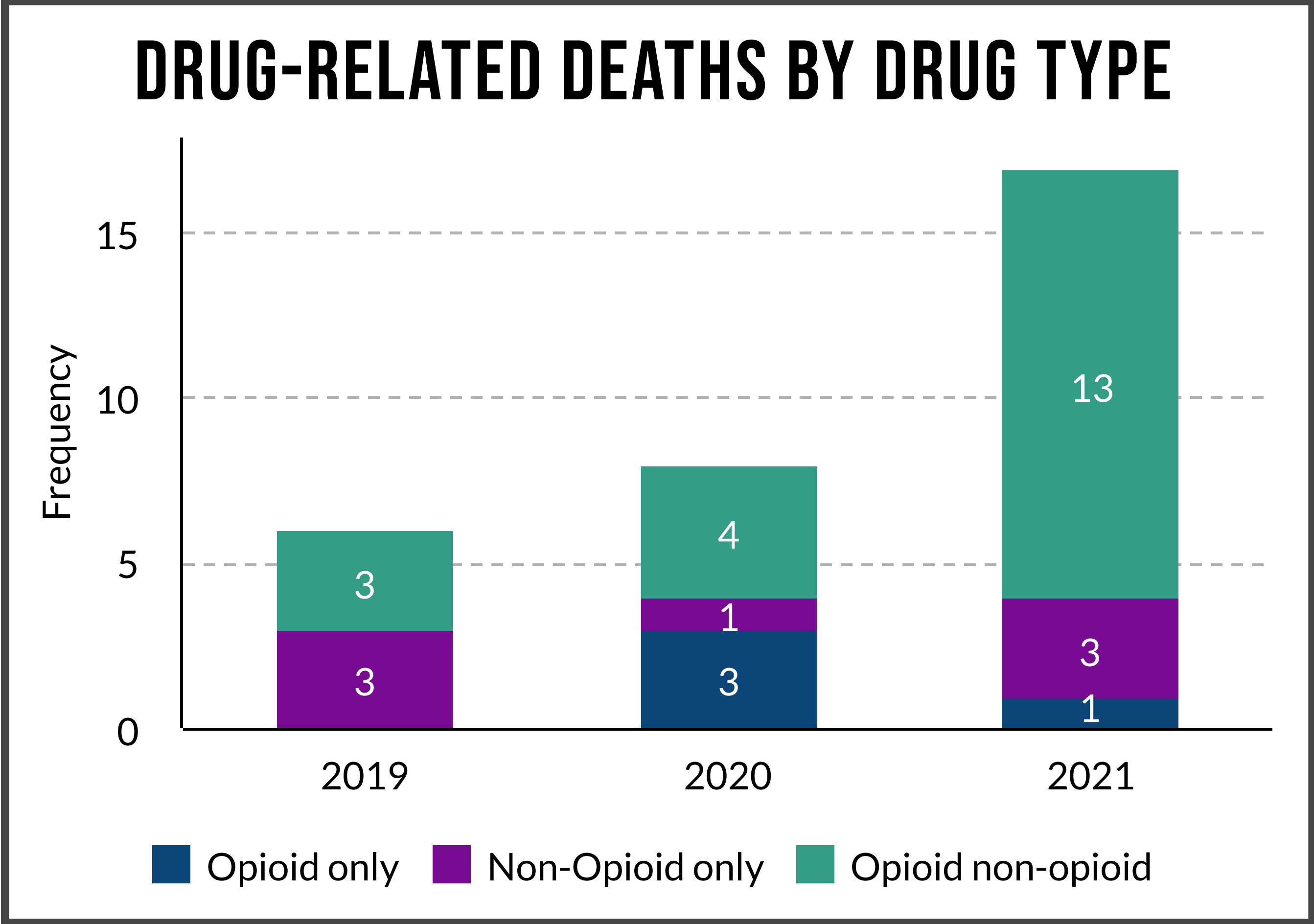
All drug-related deaths: Osceola

Age	Race	Sex	Death certificate: Substances contributing to death	Injury zip code
32	W	M	fentanyl, methamphetamine	49631
34	W	M	fentanyl, cyclobenzaprine, methamphetamine, para-fluorofentanyl, xylazine	49655
51	W	M	fentanyl, methamphetamine, methadone, tramadol	49631
53	B	M	fentanyl, methamphetamine	49639
61	W	M	methamphetamine	49677

Deaths Related to Opioids and Other Drugs

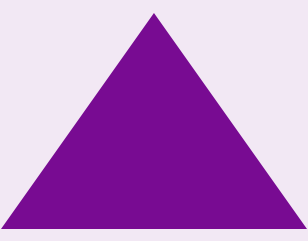
Mason, Leelanau, & Osceola County

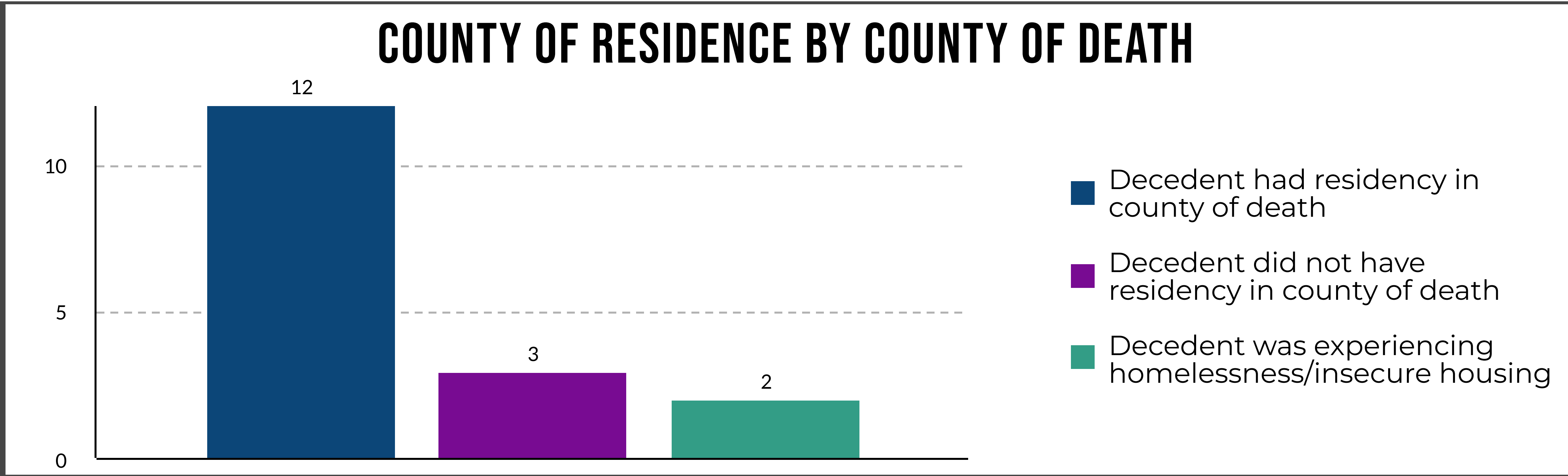
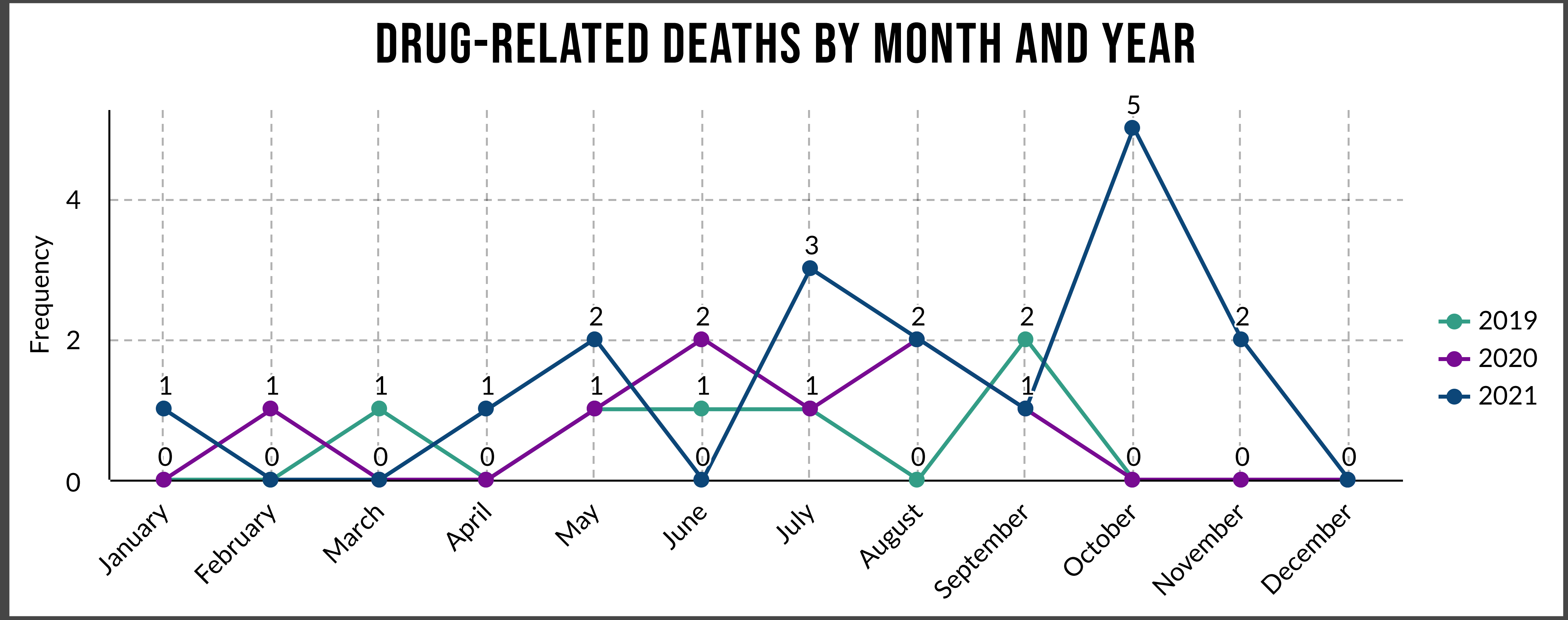
Total Drug-Related Deaths



Year	Total deaths	Deaths per 10,000
2019	6	0.8
2020	8	1.1
2021	17	2.3

Percent change

 113% from 2020 to 2021

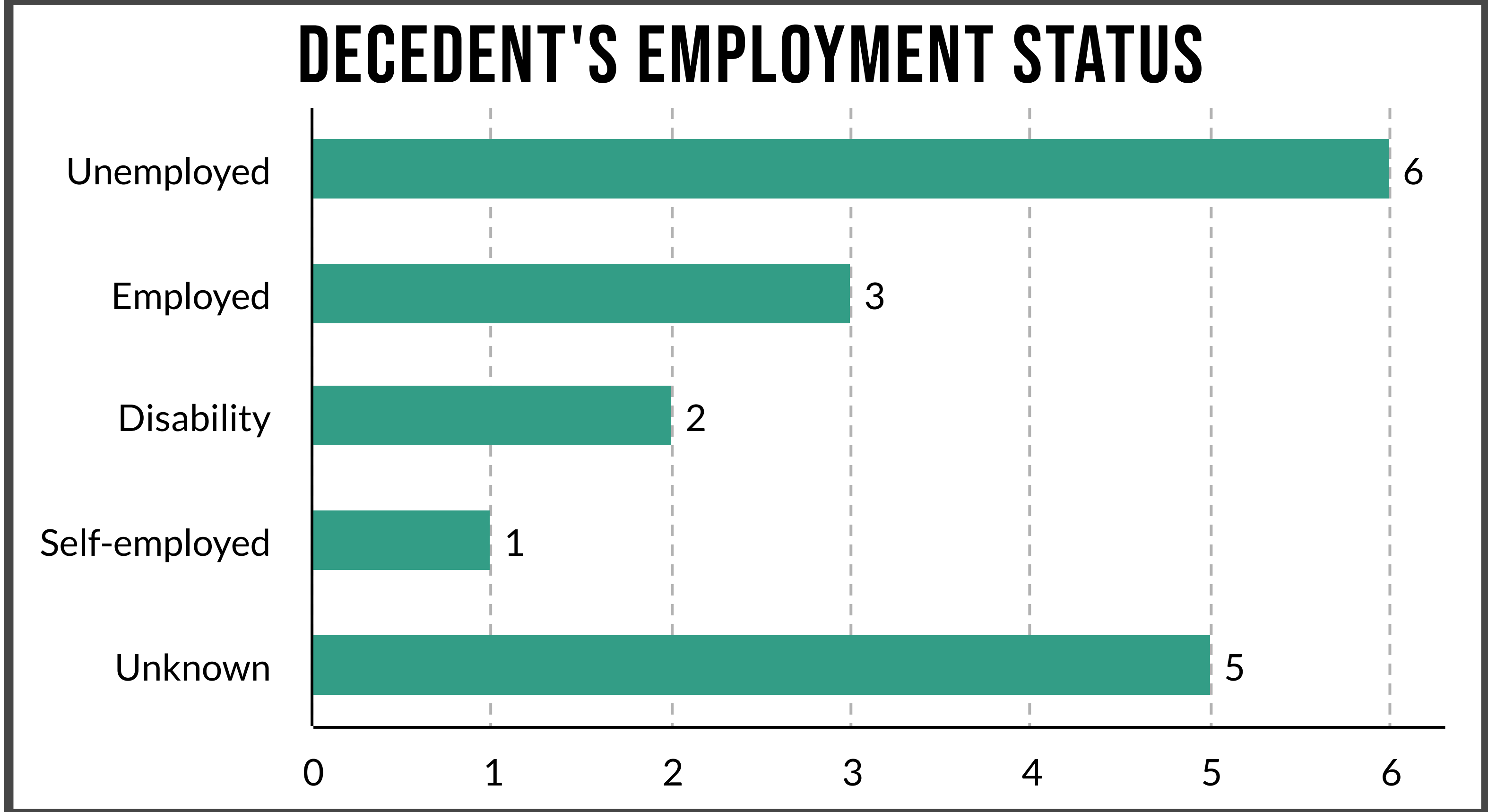


Deaths Related to Opioids and Other Drugs

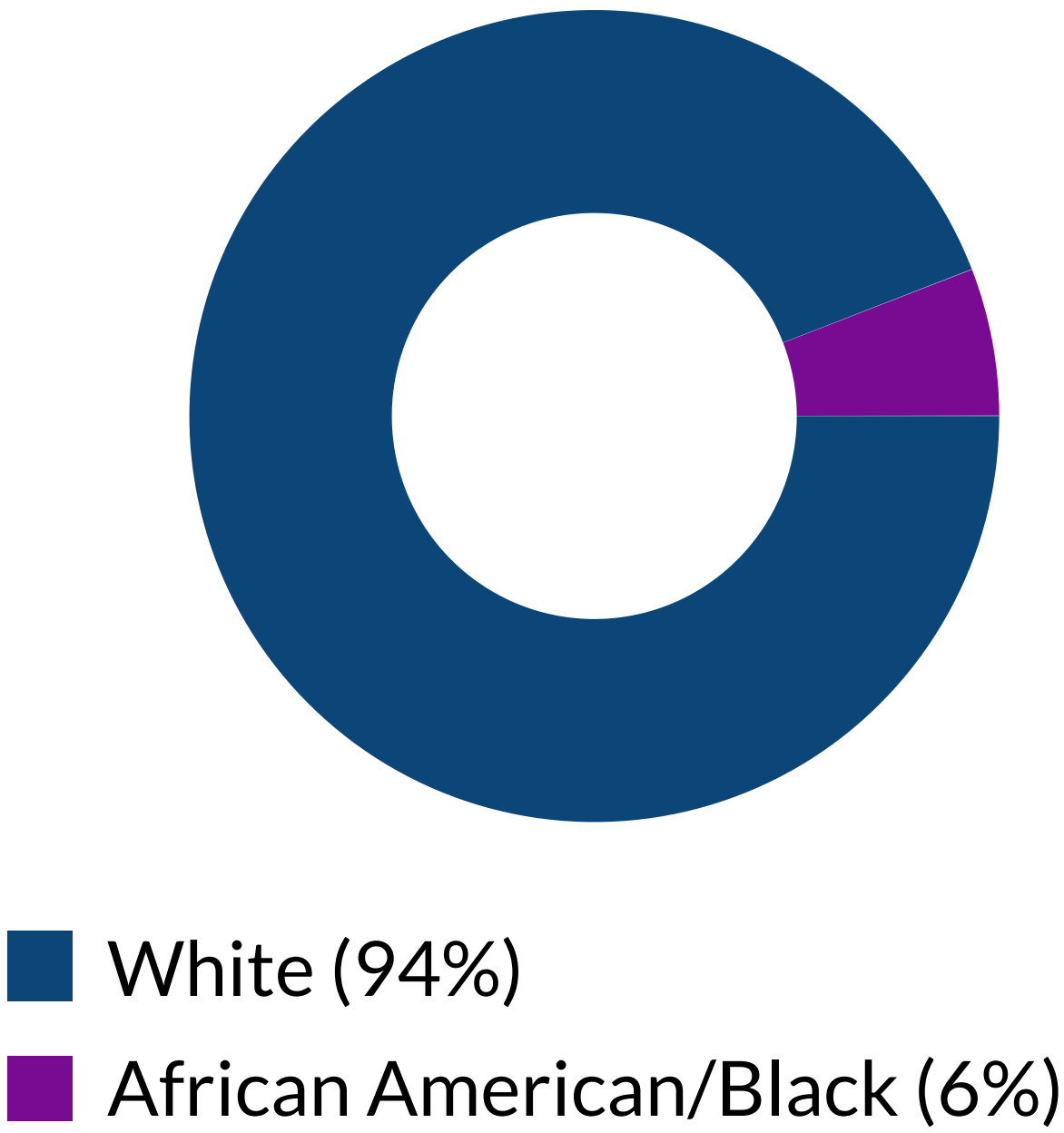
Mason, Leelanau, & Osceola County

Demographics

DECEDENT'S EMPLOYMENT STATUS



RACE



SEX

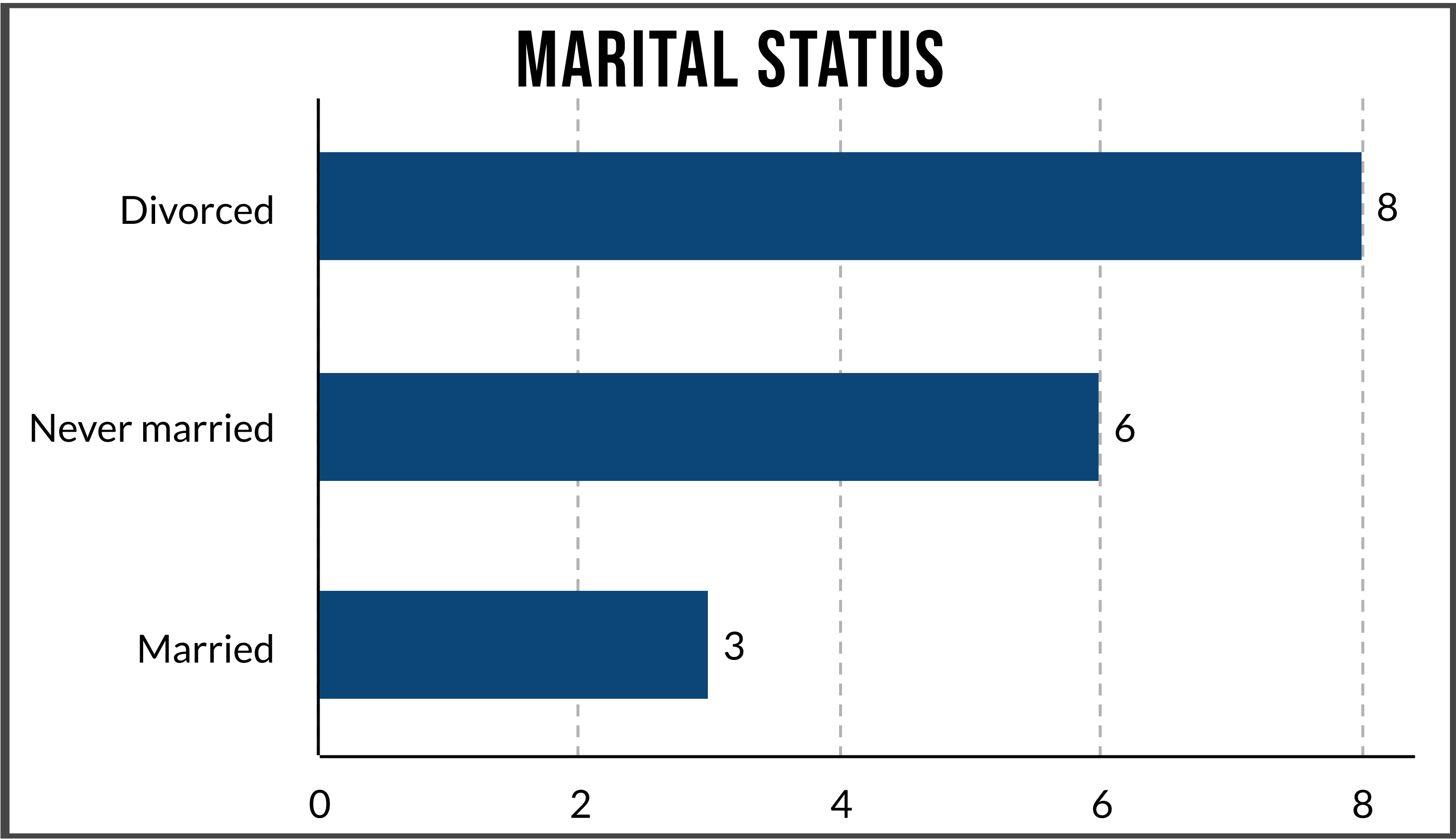


31%

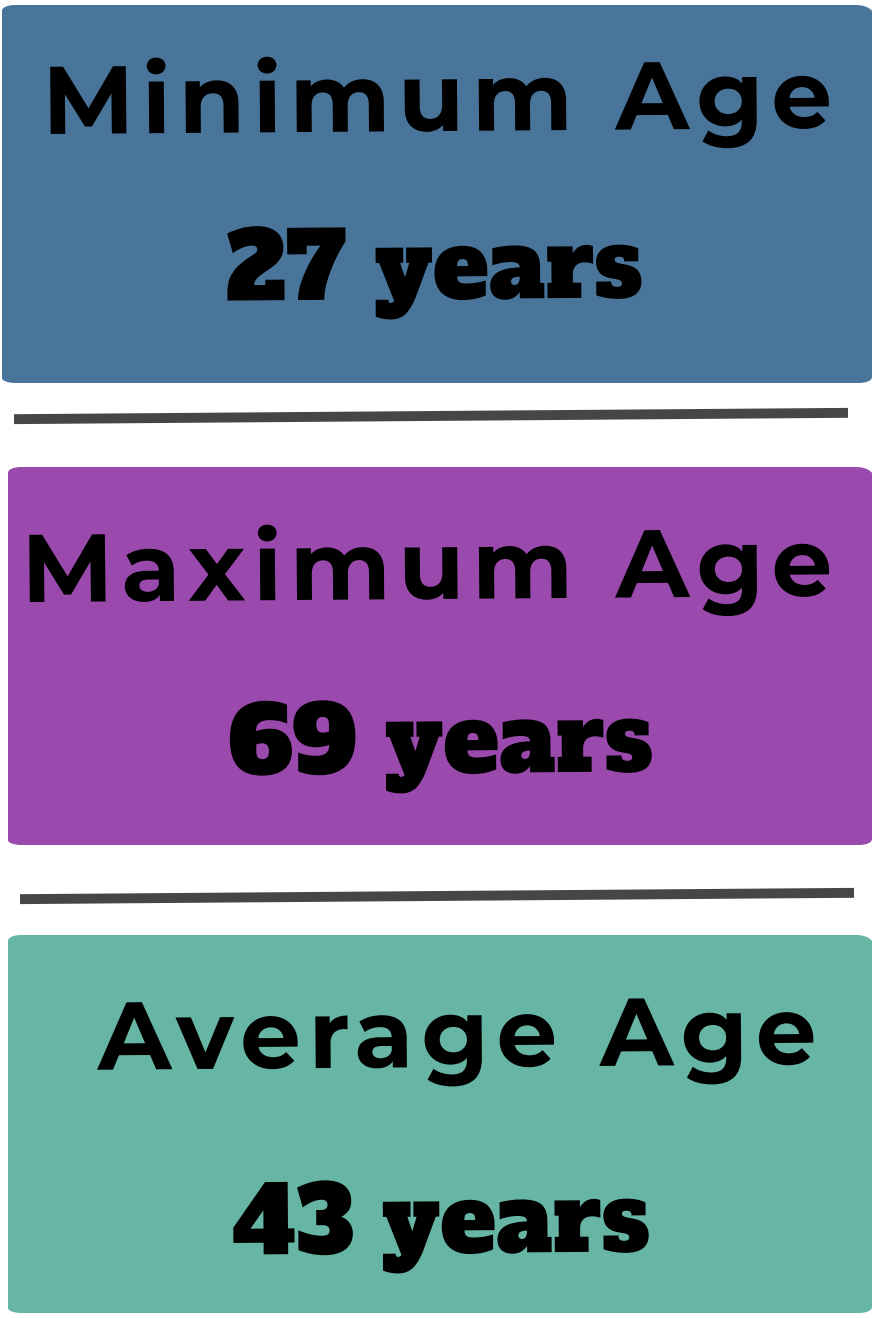


69%

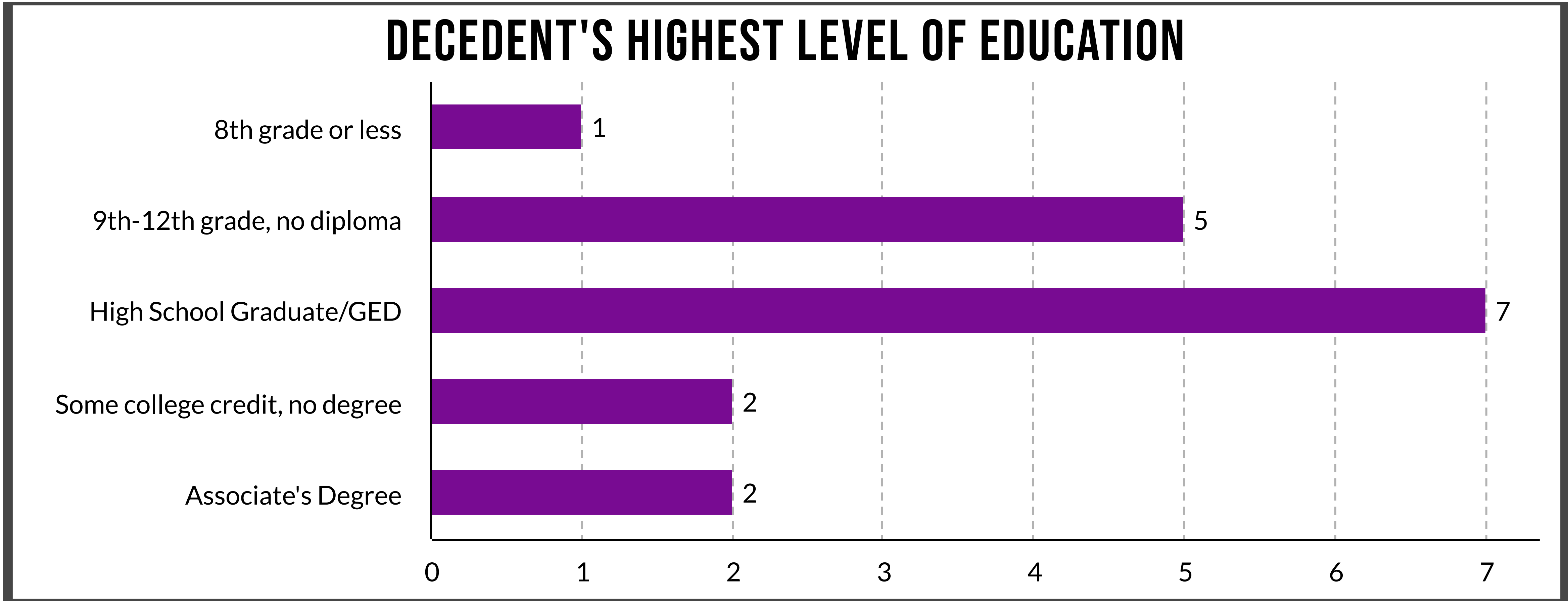
MARITAL STATUS



AGE



DECEDENT'S HIGHEST LEVEL OF EDUCATION



Deaths Related to Opioids and Other Drugs

Mason, Leelanau, & Osceola County

Health Factors

MOST COMMON AILMENTS*

Pain (41%)**

Lung ***(24%)

Hypertension (35%)

Heart**** (6%)

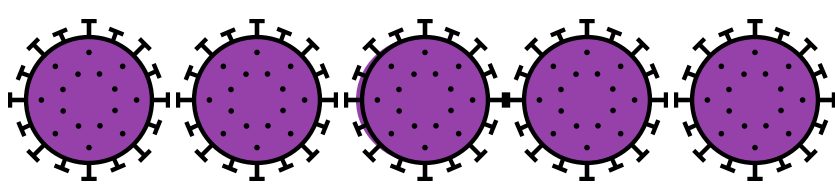
Diabetes (6%)

*Decedents may be represented in more than one category.
Only illnesses with diagnosis by a medical professional are included.

**Pain includes back pain, migraine, fibromyalgia, and knee pain

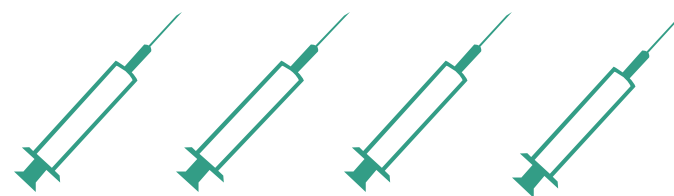
***Lung includes asthma and COPD

****Heart includes MI, CAD, and AFib (see end of page)



At least **2** decedents were **Hepatitis C** positive

1 of these decedents was known to use **substances intravenously**



Decedent used tobacco

82%



Decedent drank alcohol*

41%



*Moderate to heavy use

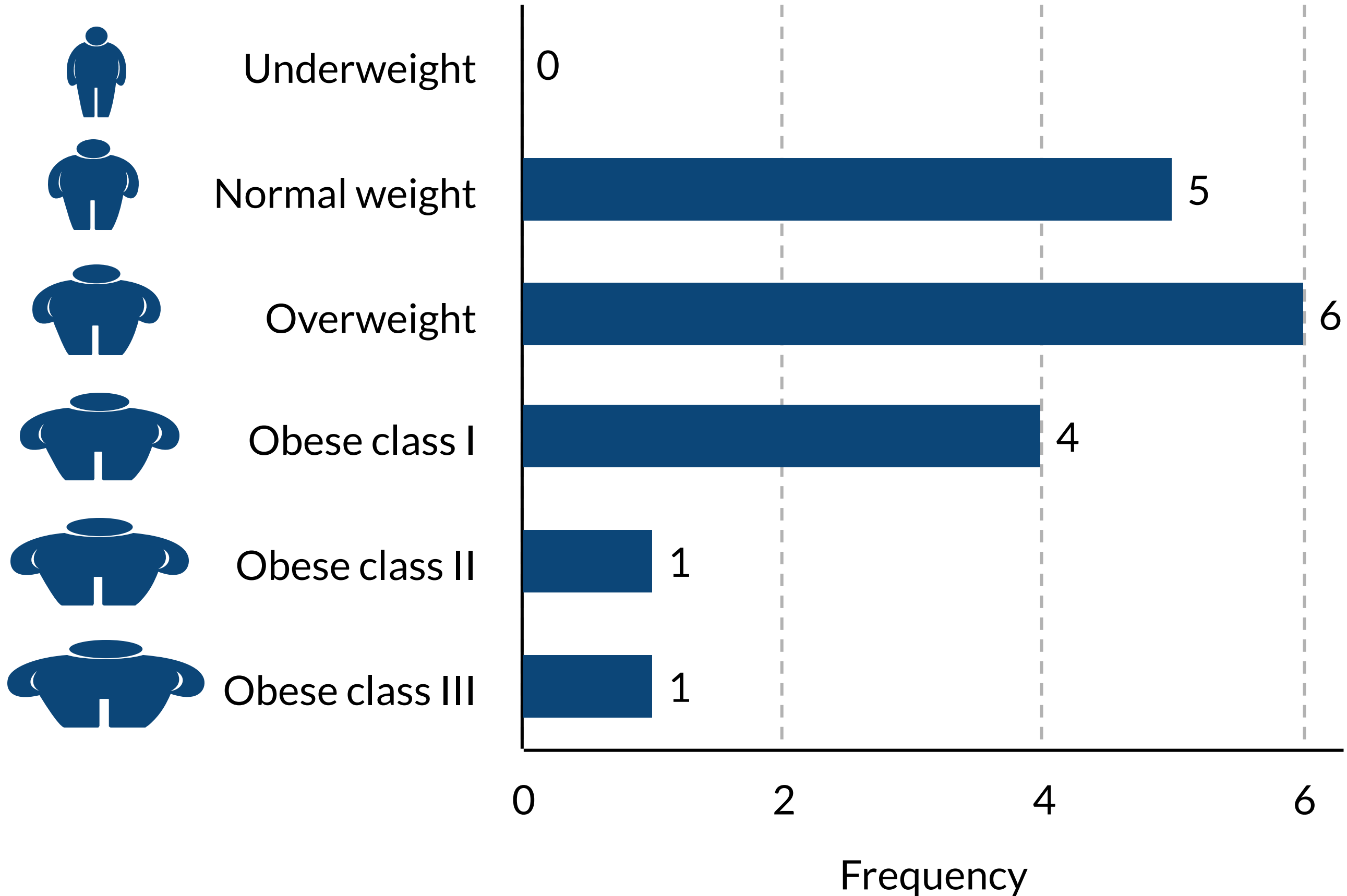
Decedent had a PCP*

12%



*Primary care physician

BODY MASS INDEX (BMI)



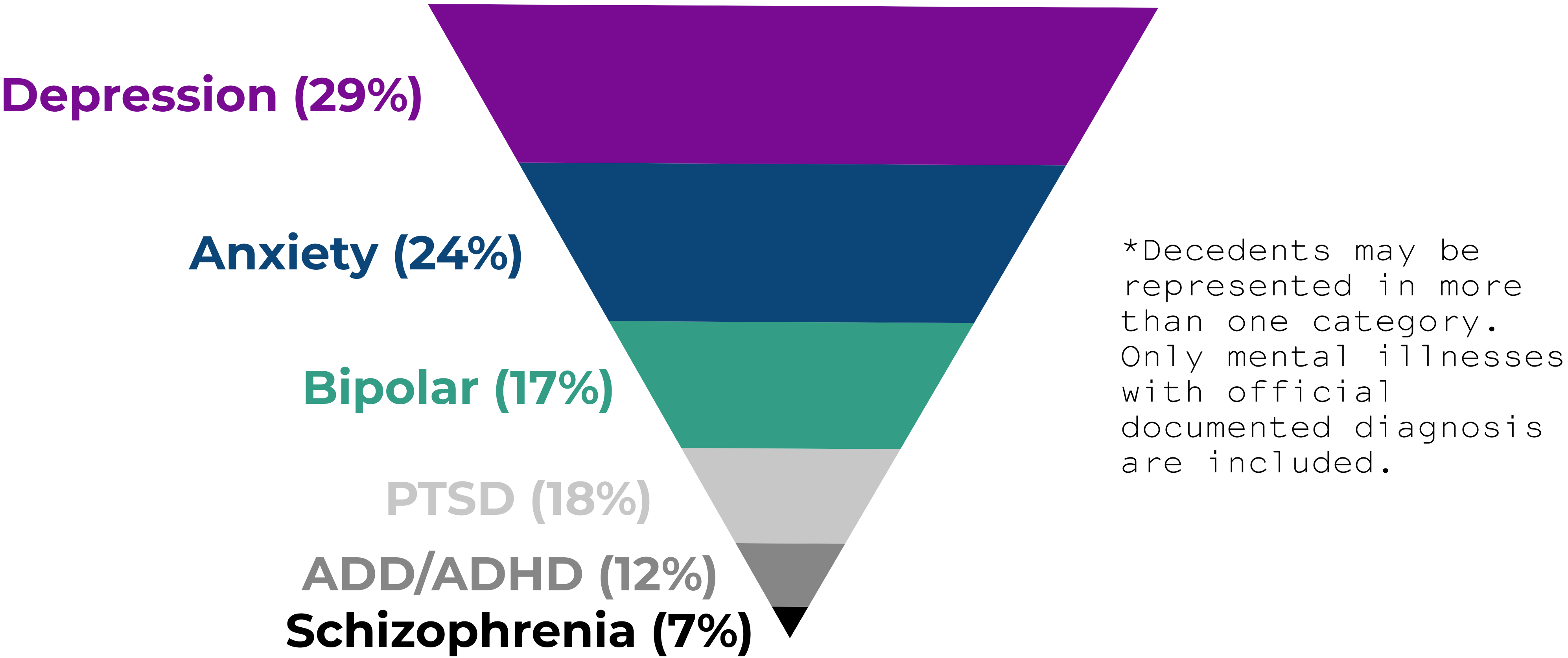
COPD=Chronic obstructive pulmonary disease; MI=Myocardial infarction; CAD=Coronary artery disease; AFib=Atrial fibrillation

Deaths Related to Opioids and Other Drugs

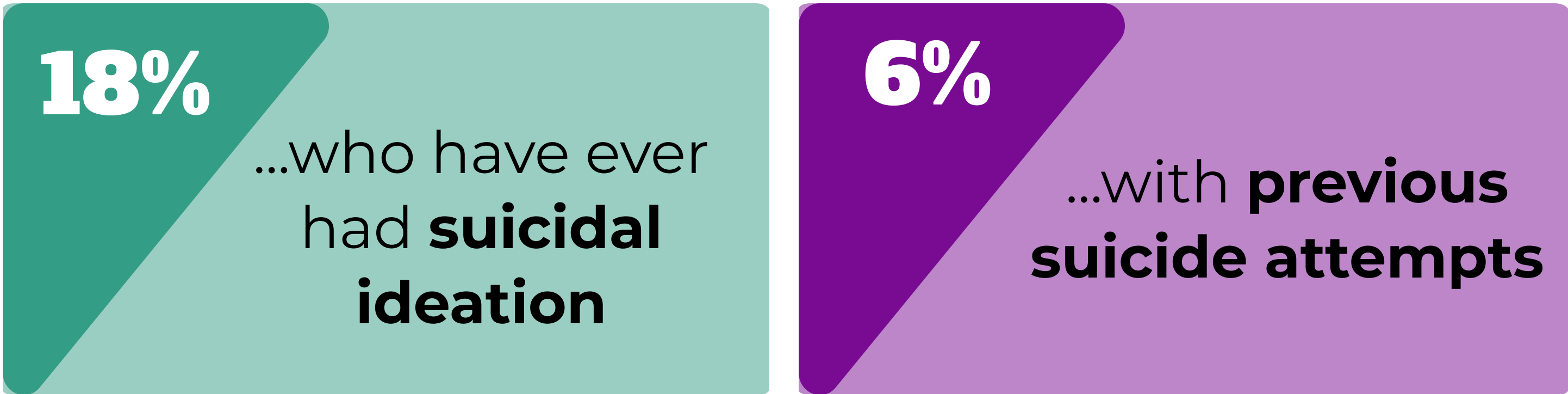
Mason, Leelanau, & Osceola County

Mental Health Factors

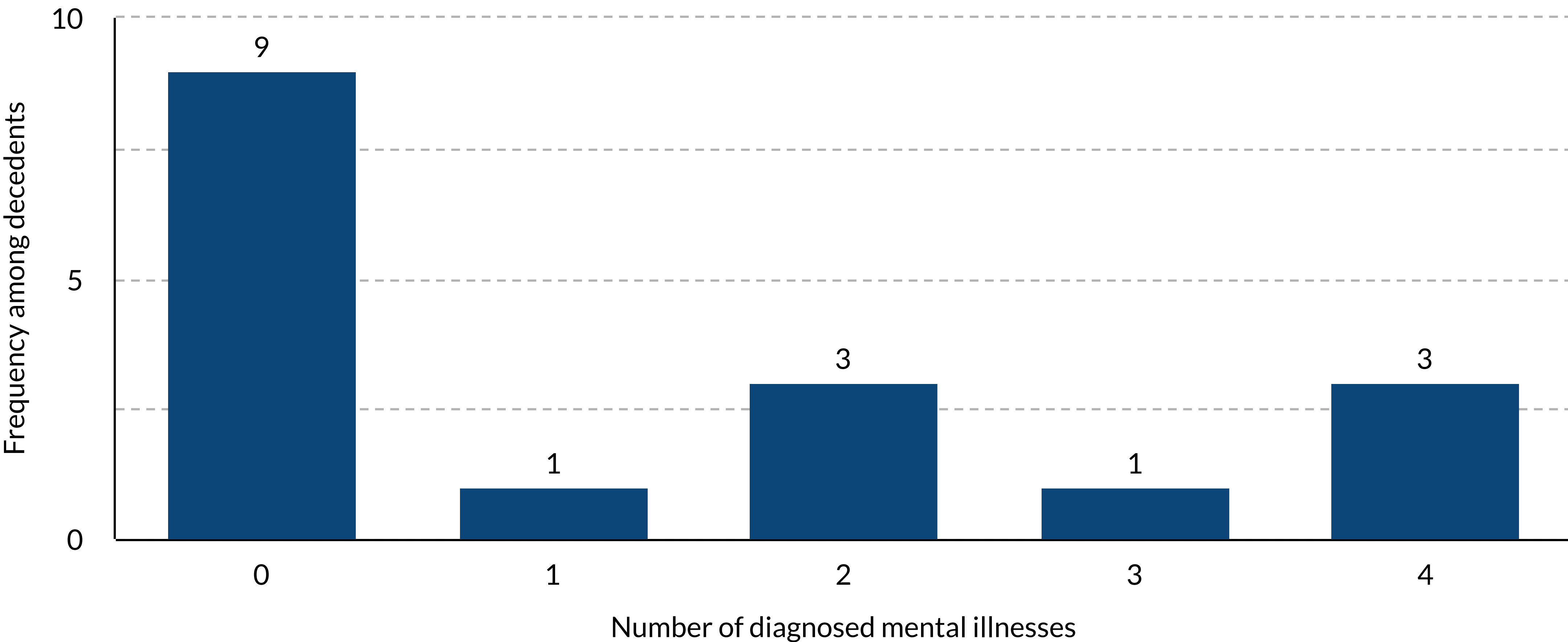
MOST COMMON MENTAL ILLNESSES



PERCENTAGE OF DECEDENTS



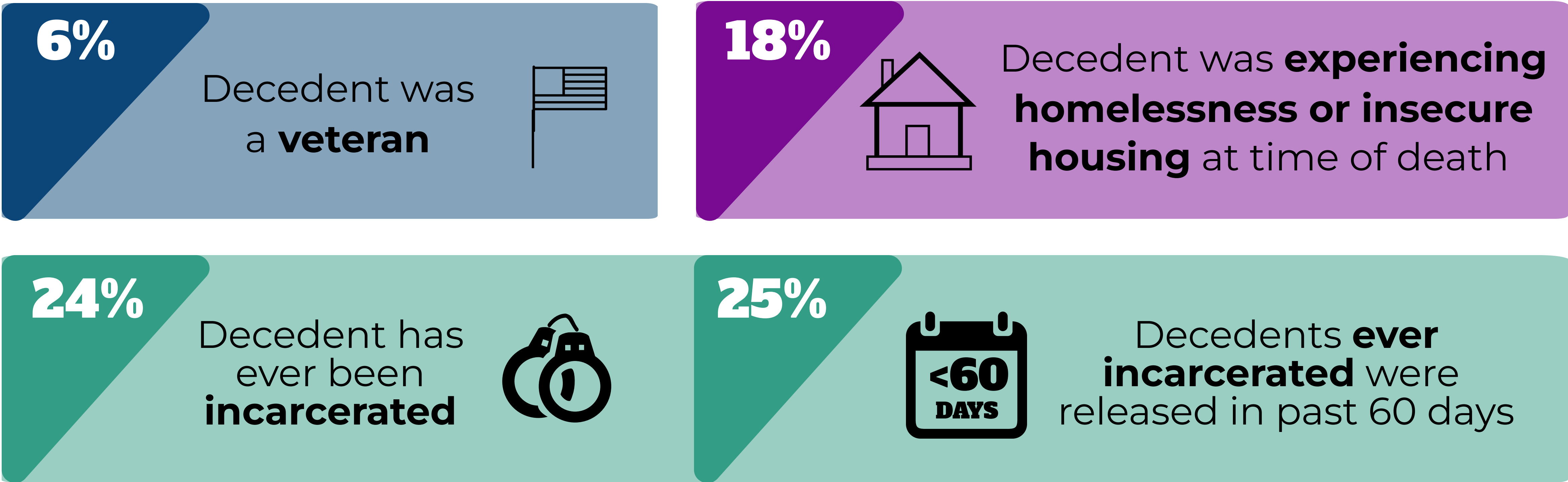
NUMBER OF DIAGNOSED MENTAL ILLNESSES AMONG DECEDENTS



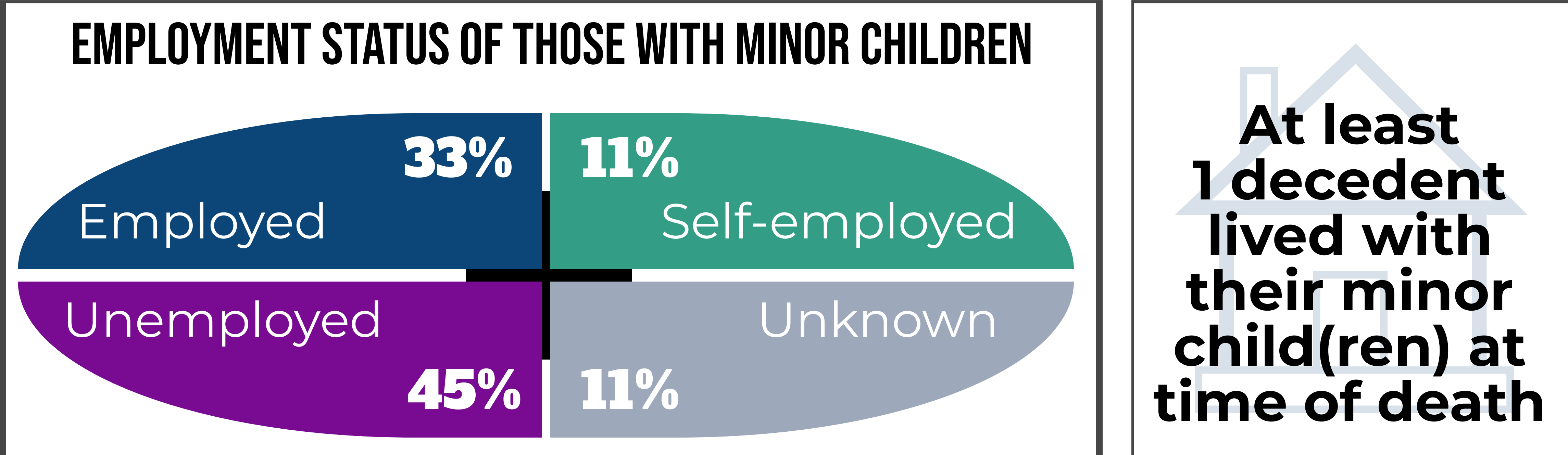
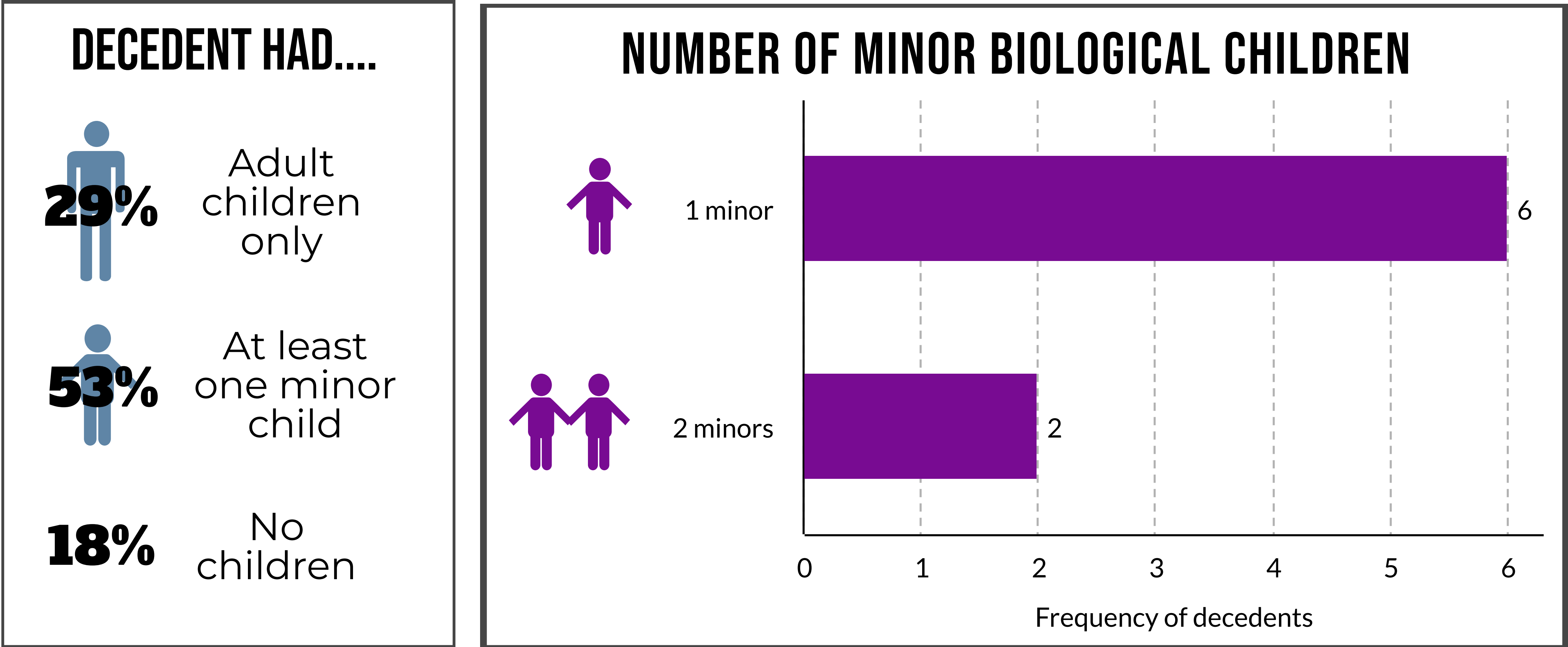
Deaths Related to Opioids and Other Drugs

Mason, Leelanau, & Osceola County

Social Factors



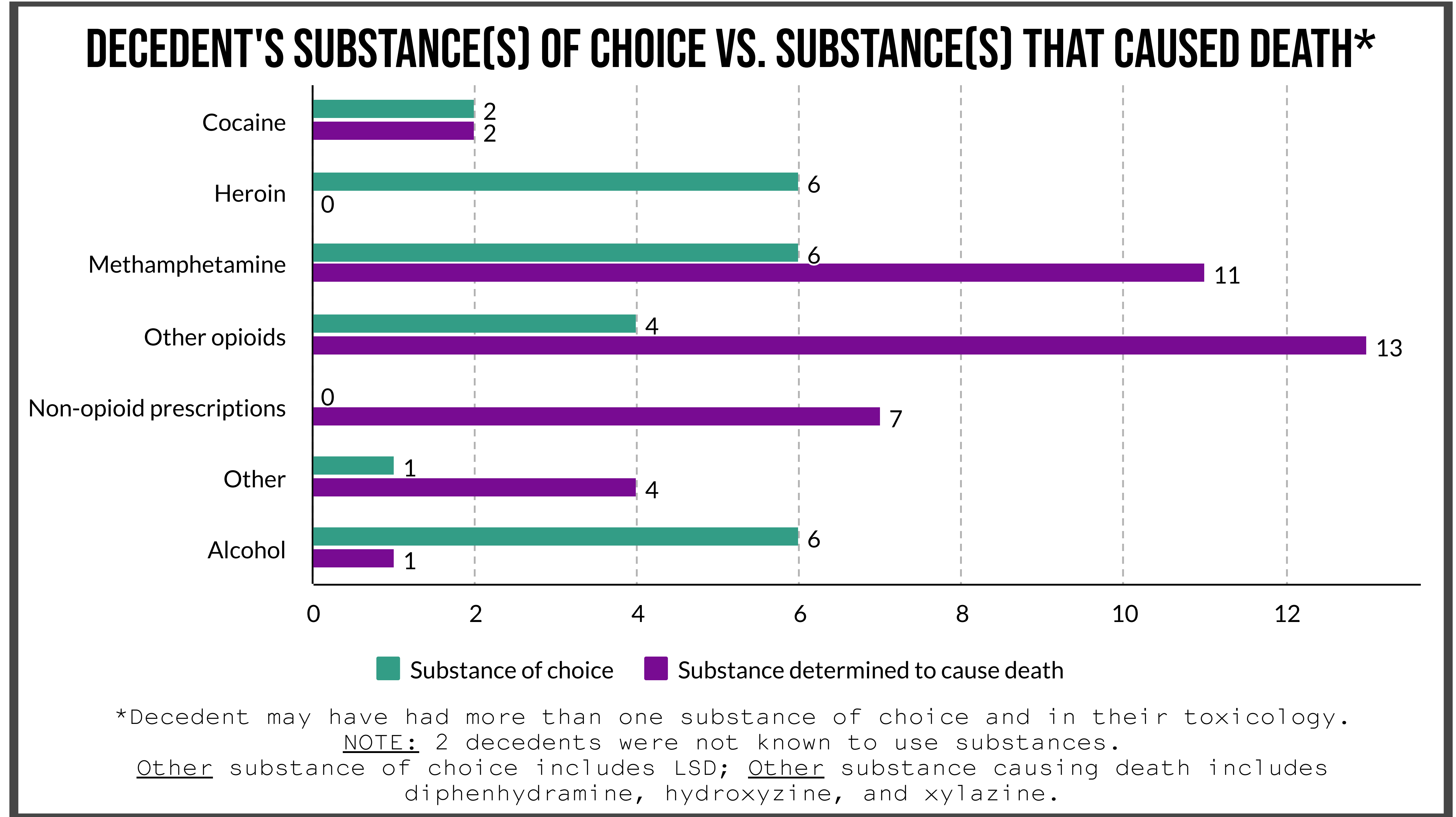
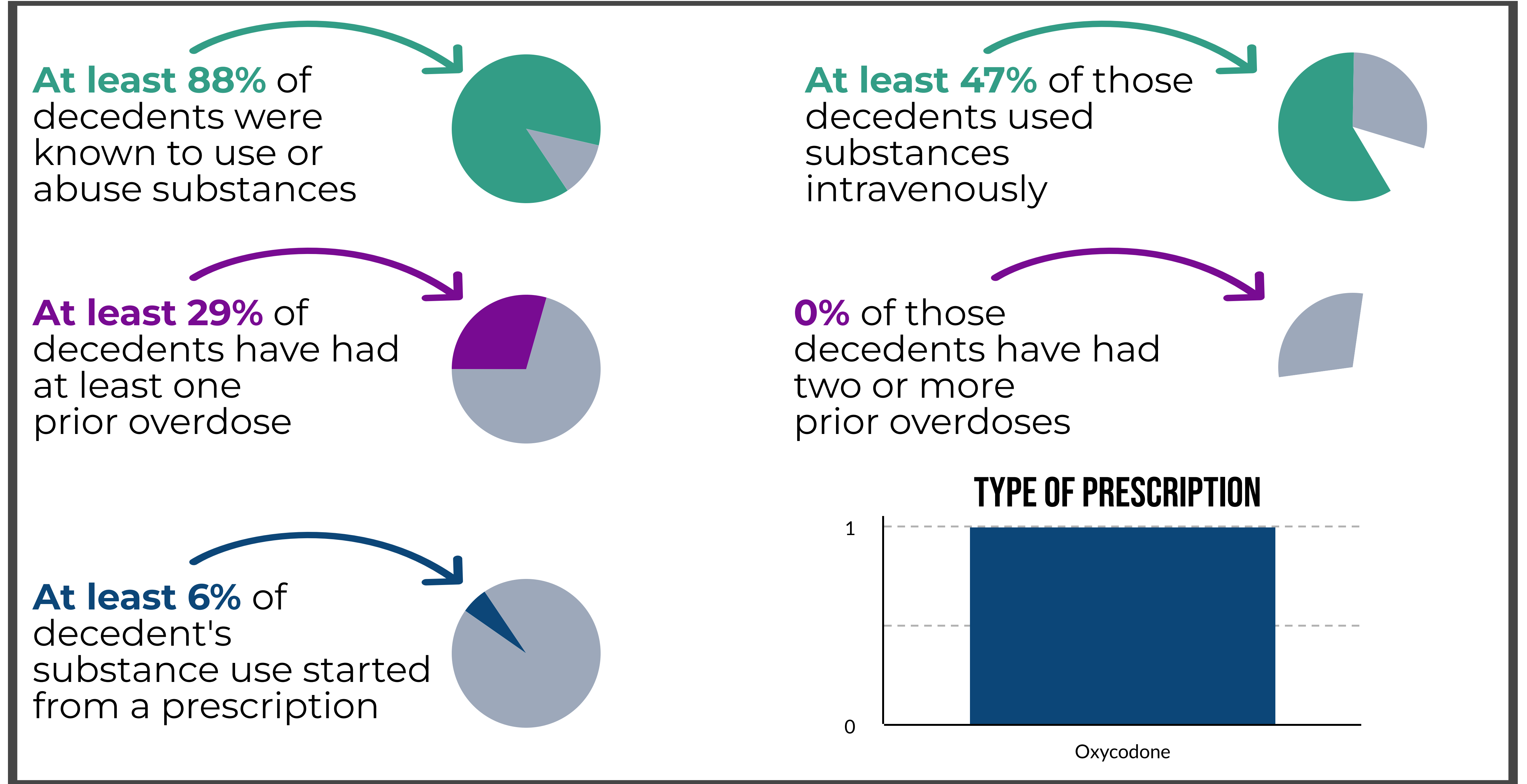
Children



Deaths Related to Opioids and Other Drugs

Mason, Leelanau, & Osceola County

Substance Use History



Deaths Related to Opioids and Other Drugs

Mason, Leelanau, & Osceola County

Substance Use History, cont.

PREFERRED METHOD OF ADMINISTRATION*

Method	Male (n=11)	Female (n=3)	White (n=14)	Total (n=14)**
Intravenous	7	2	9	9
Snort	2	1	3	3
Smoke	2	1	3	3
Transdermal	0	0	0	0
Huff	0	0	0	0
Oral	2	2	4	4
Unknown	2	0	2	2

*Decedent may have had more than one preferred method of administration. Only includes decedents with a substance use history (n=15). **Decedent of African-American descent is excluded (n=1).

RECOVERY HISTORY (N=15)*

Decedent was recently reportedly **substance free** in the past three weeks

20%

Decedent has been to a **treatment clinic or detox center** at least one time

27%

Decedent was currently receiving or has received **medication for opioid use disorder** in the past two years

13%

SUSPECTED REASON FOR RELAPSE**

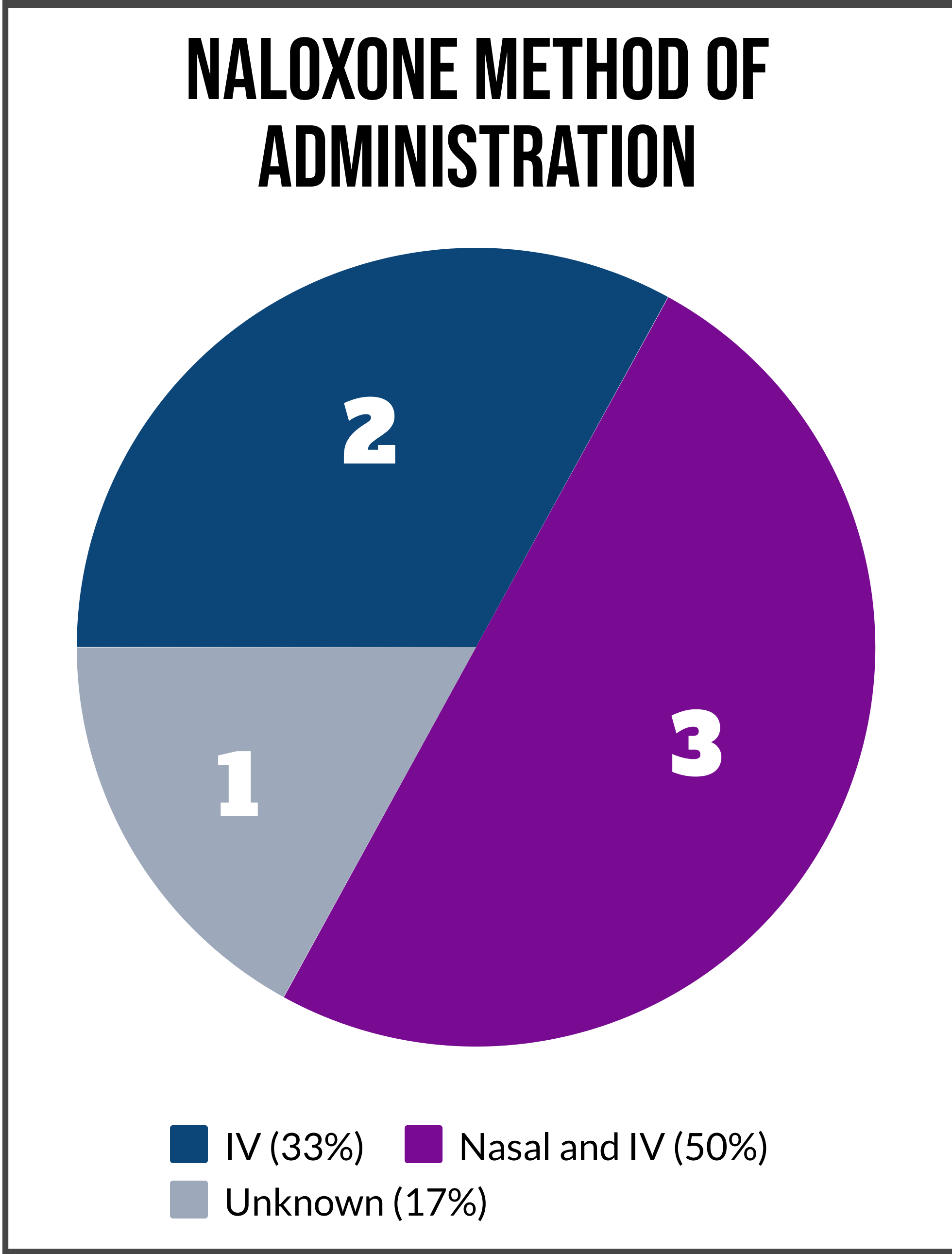
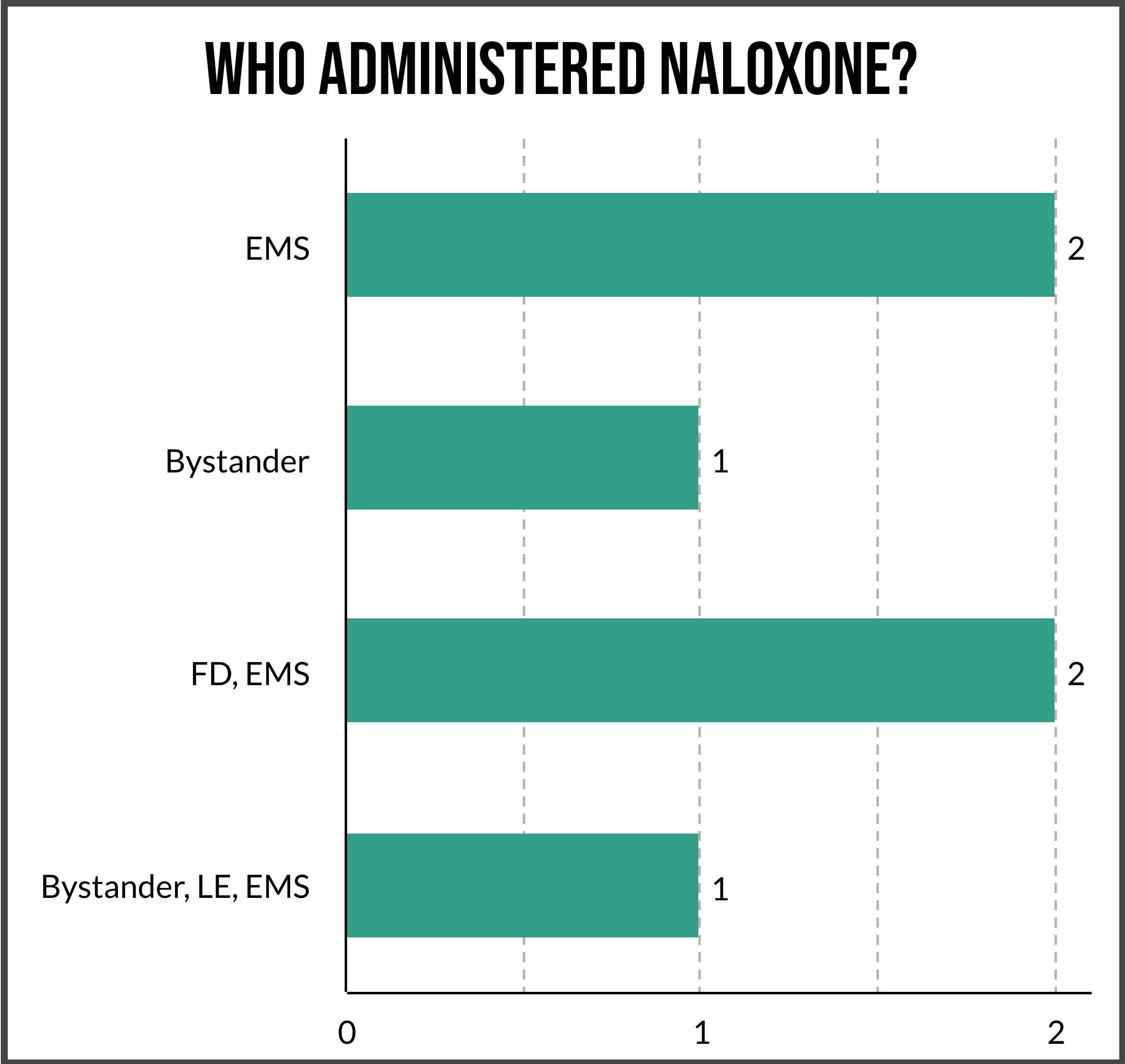
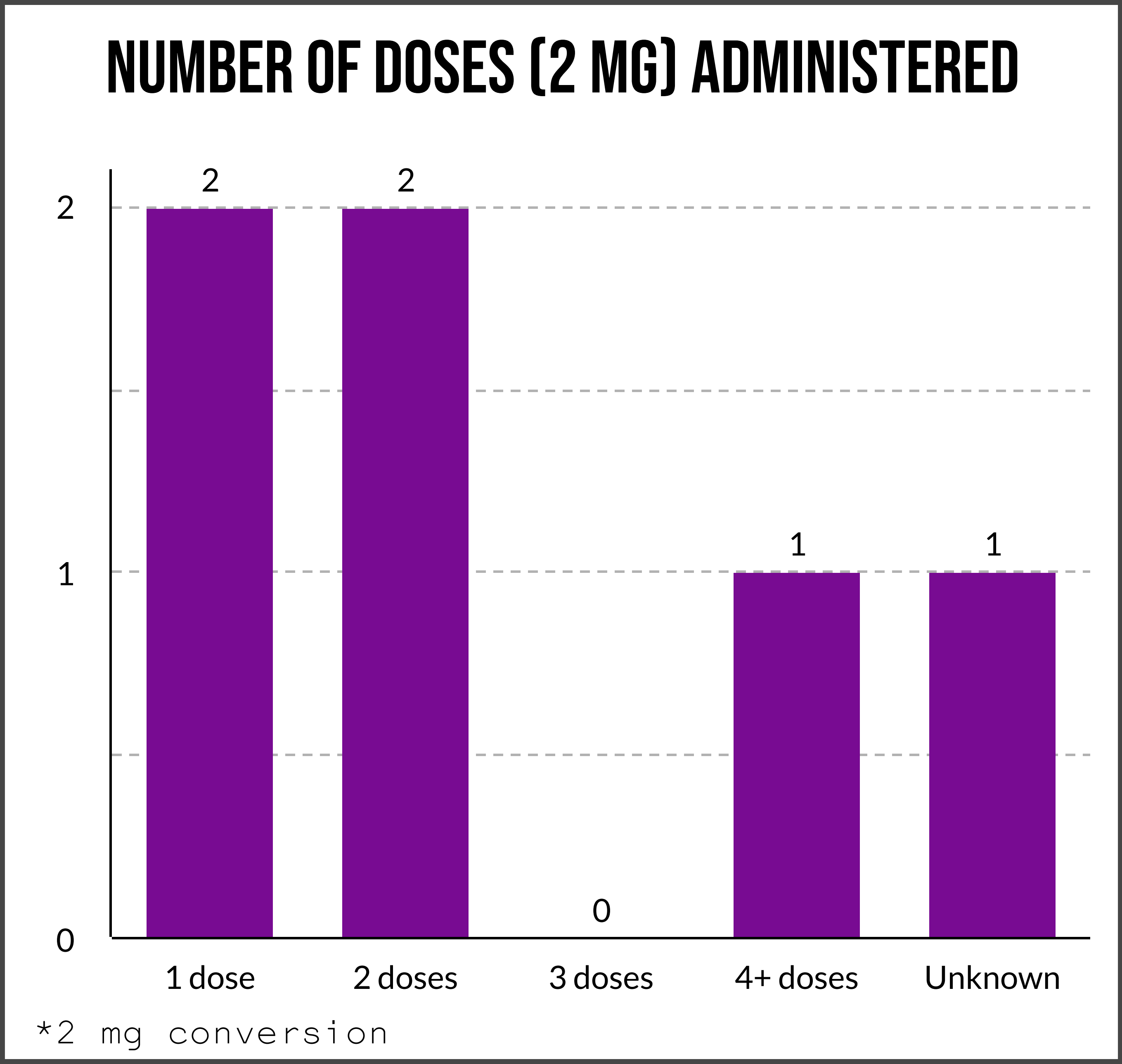
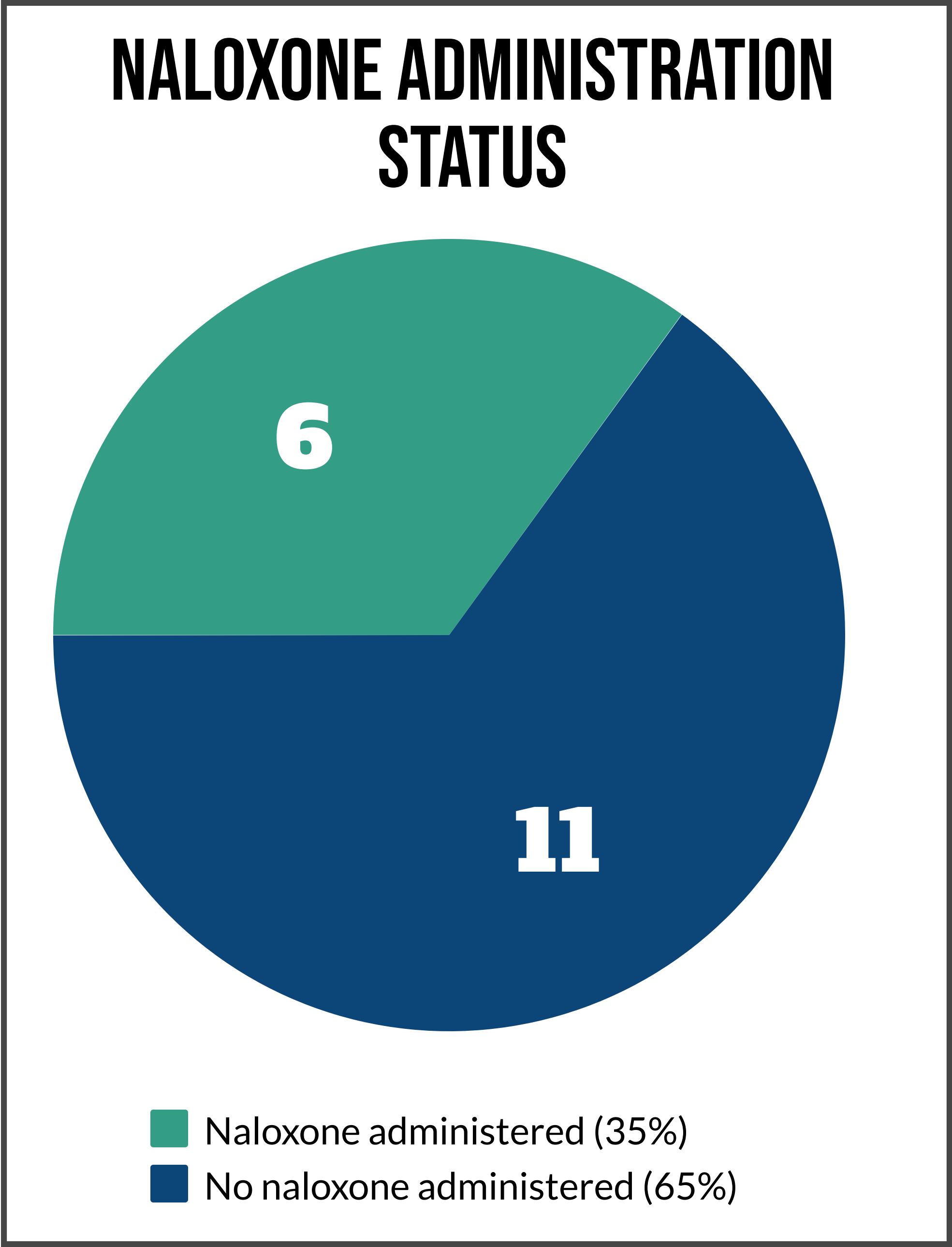


*ONLY Decedents known to use substances are included.

Deaths Related to Opioids and Other Drugs

Mason, Leelanau, & Osceola County

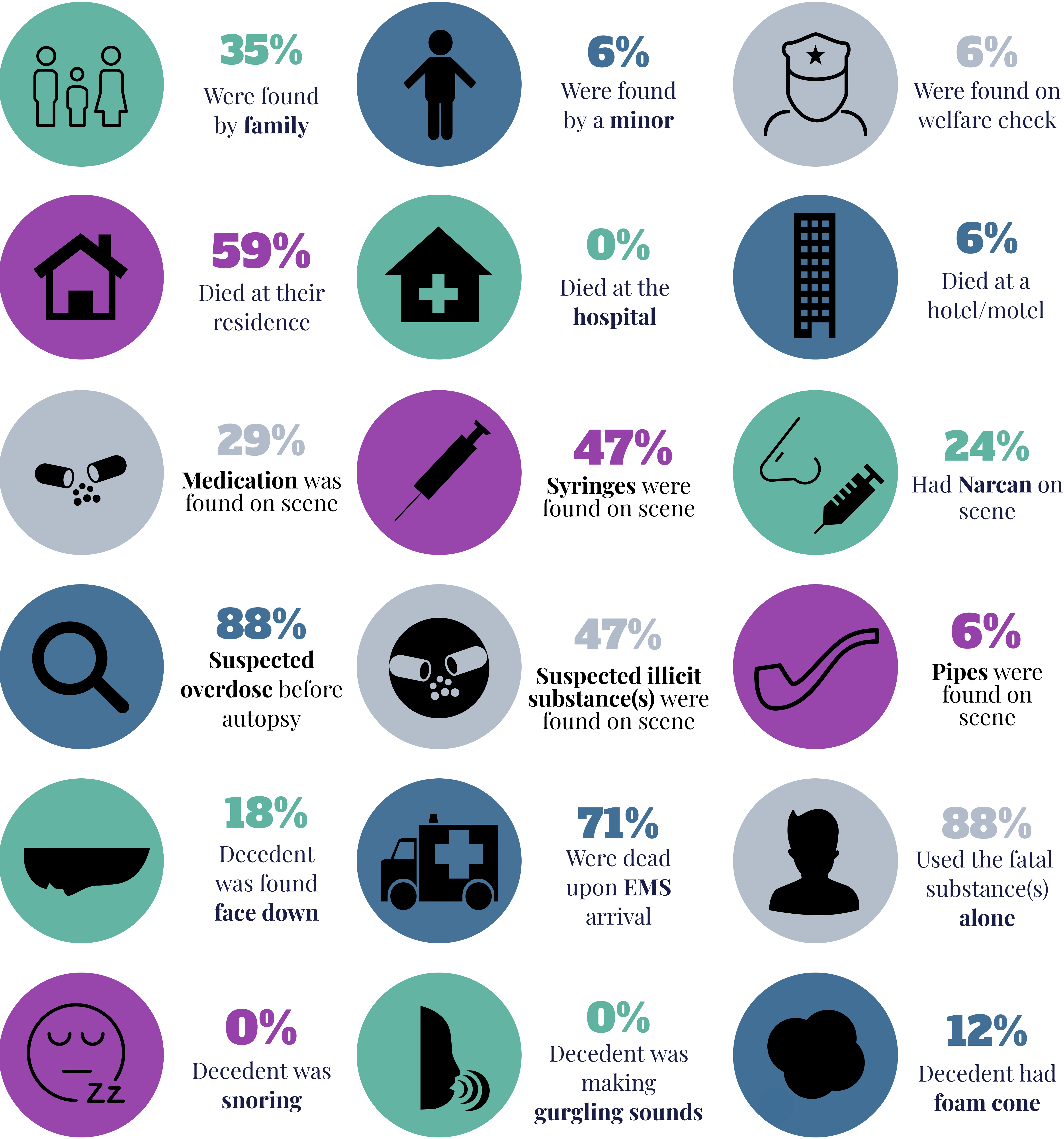
Naloxone Administration



Deaths Related to Opioids and Other Drugs

Mason, Leelanau, & Osceola County

Death Scene Findings

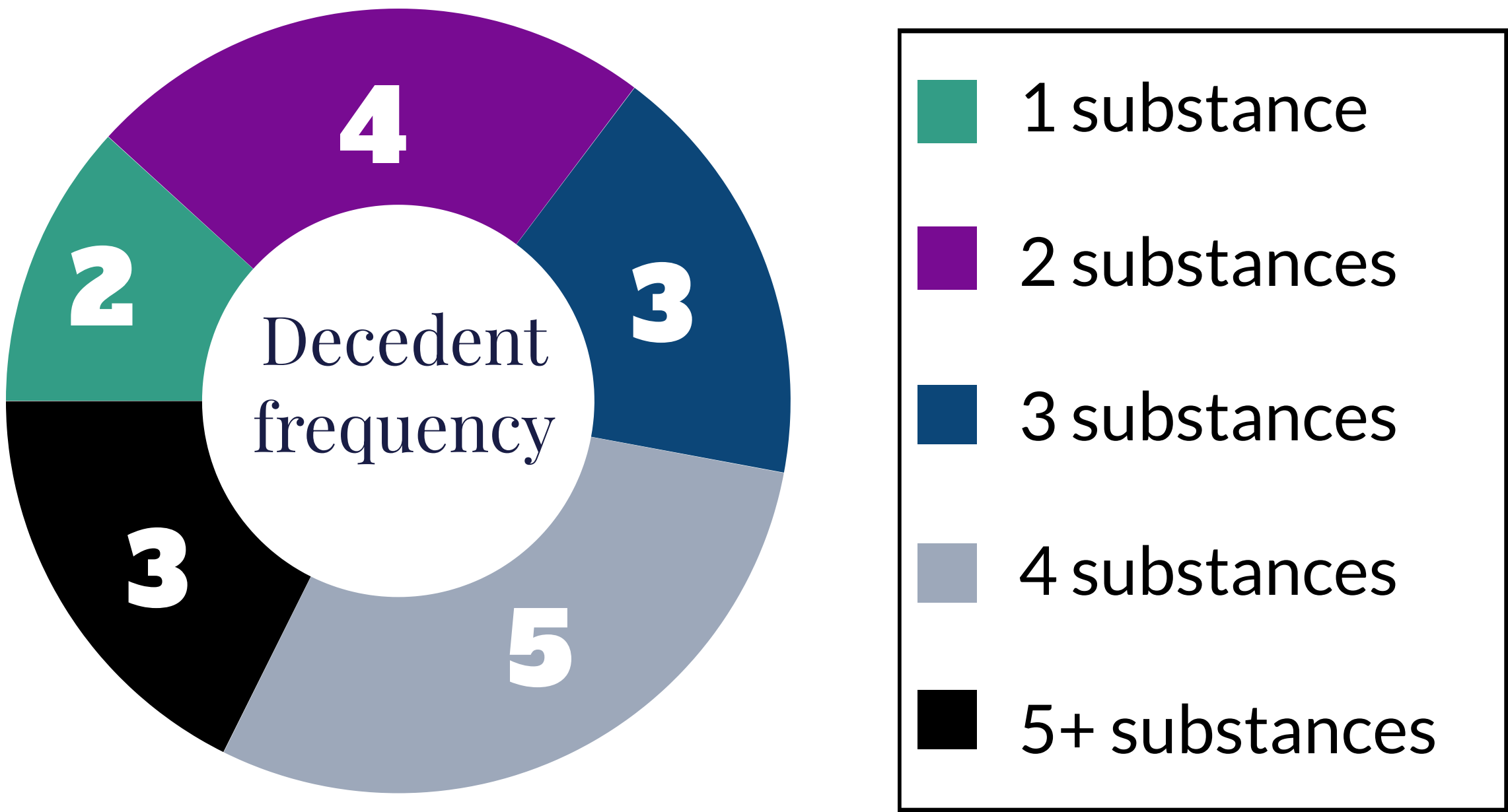


Deaths Related to Opioids and Other Drugs

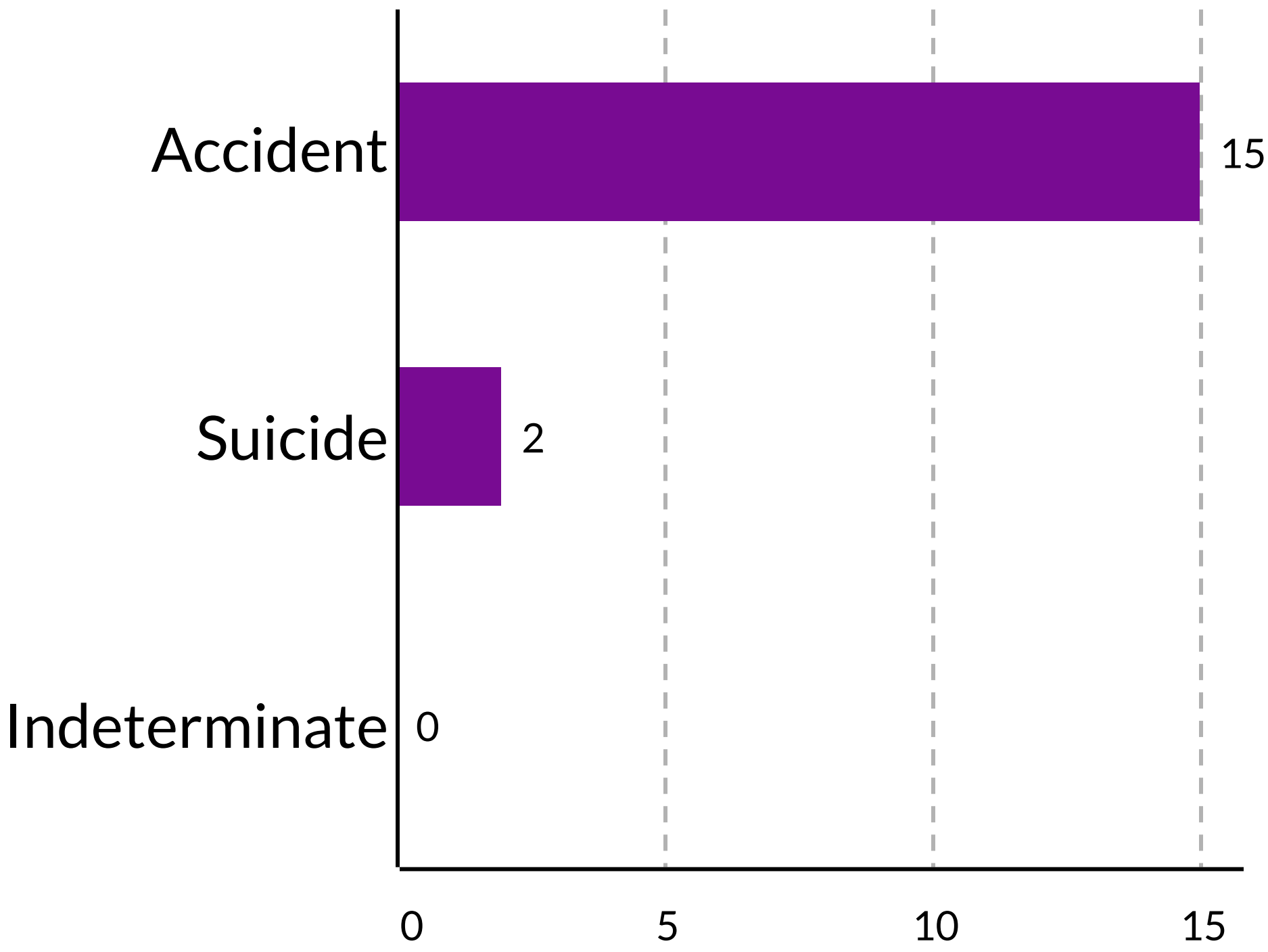
Mason, Leelanau, & Osceola County

Autopsy and Toxicology Results

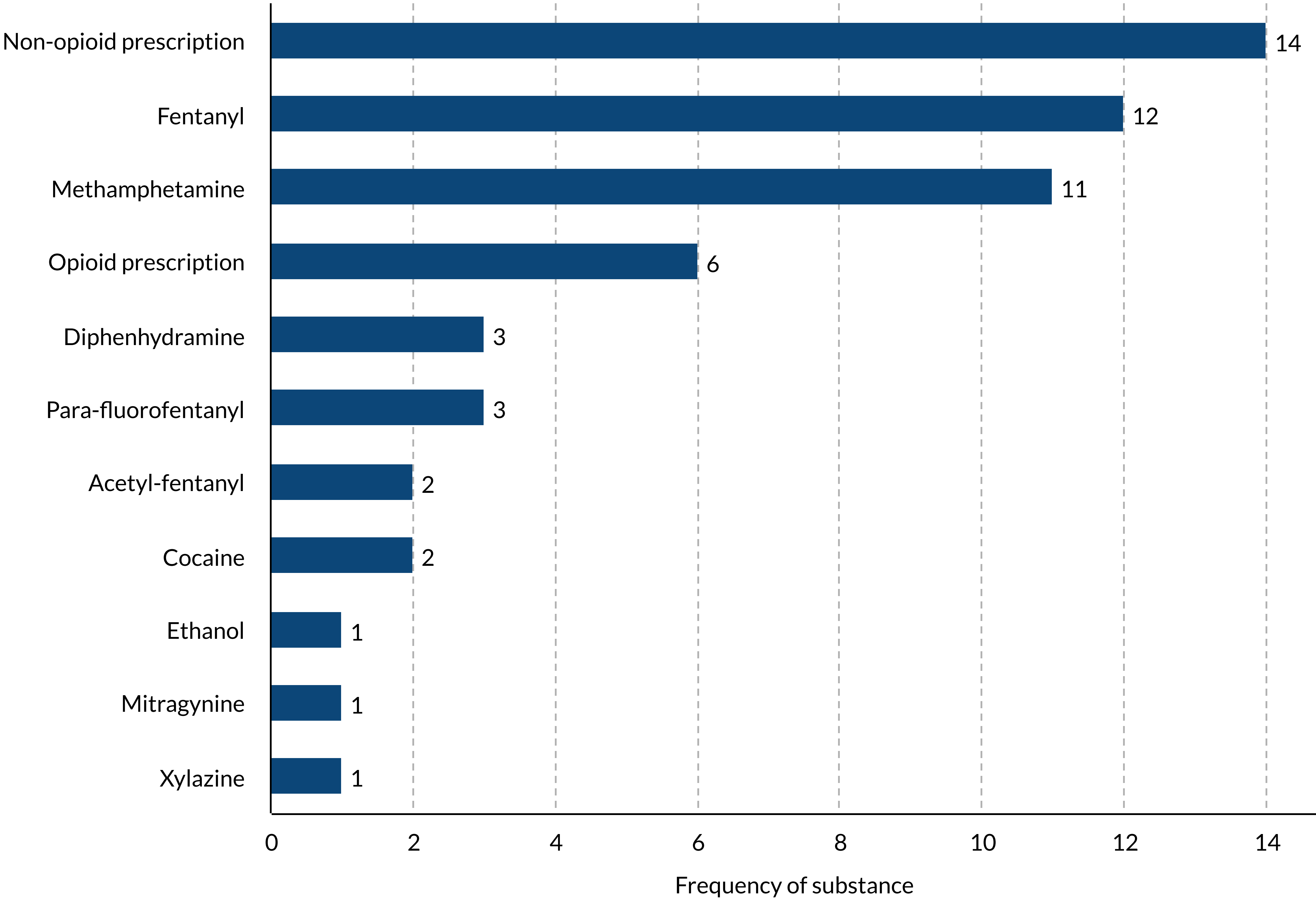
NUMBER OF SUBSTANCES
CONTRIBUTING TO DEATH



MANNER OF DEATH



SUBSTANCES CONTRIBUTING TO DEATH

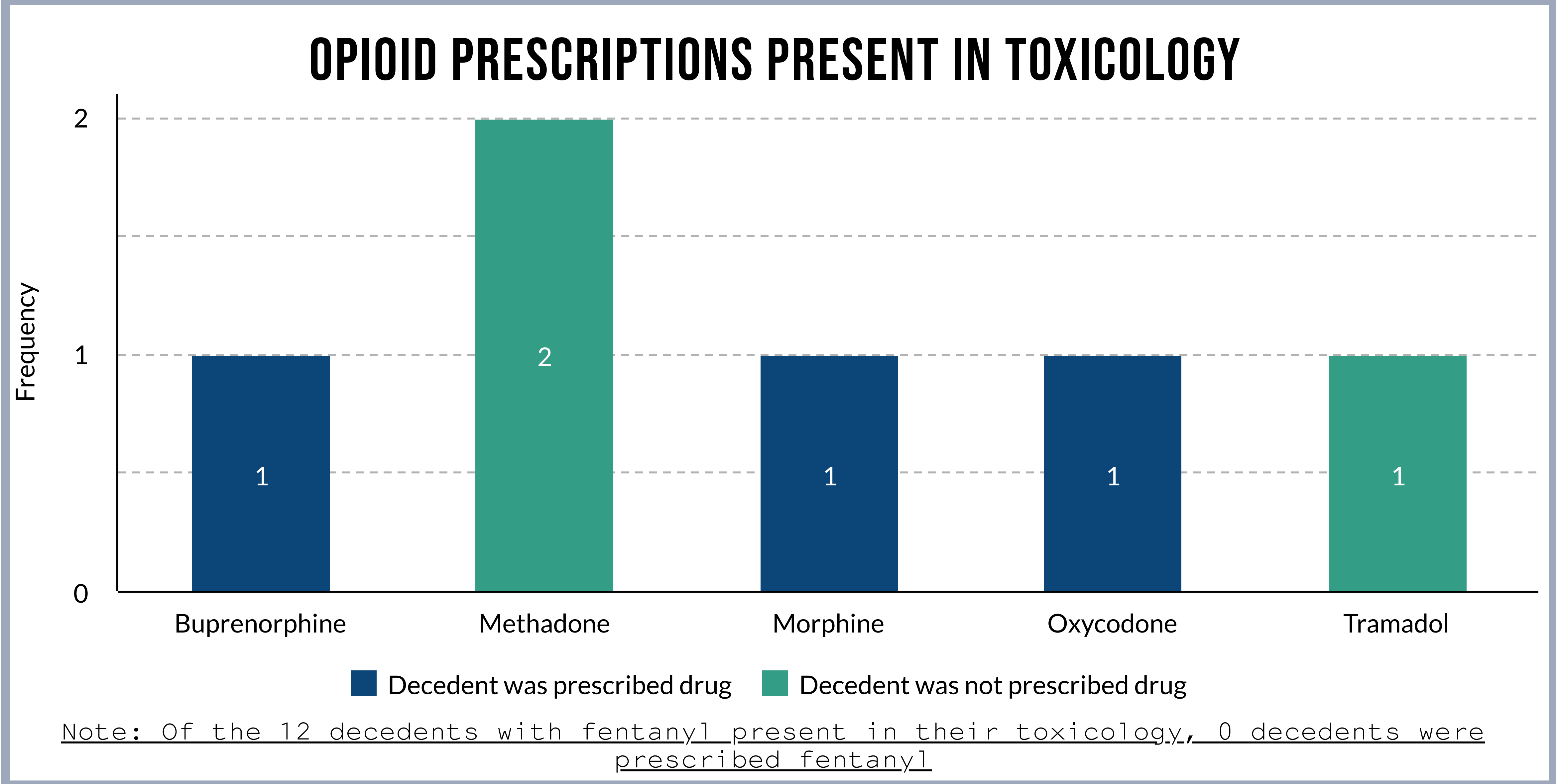
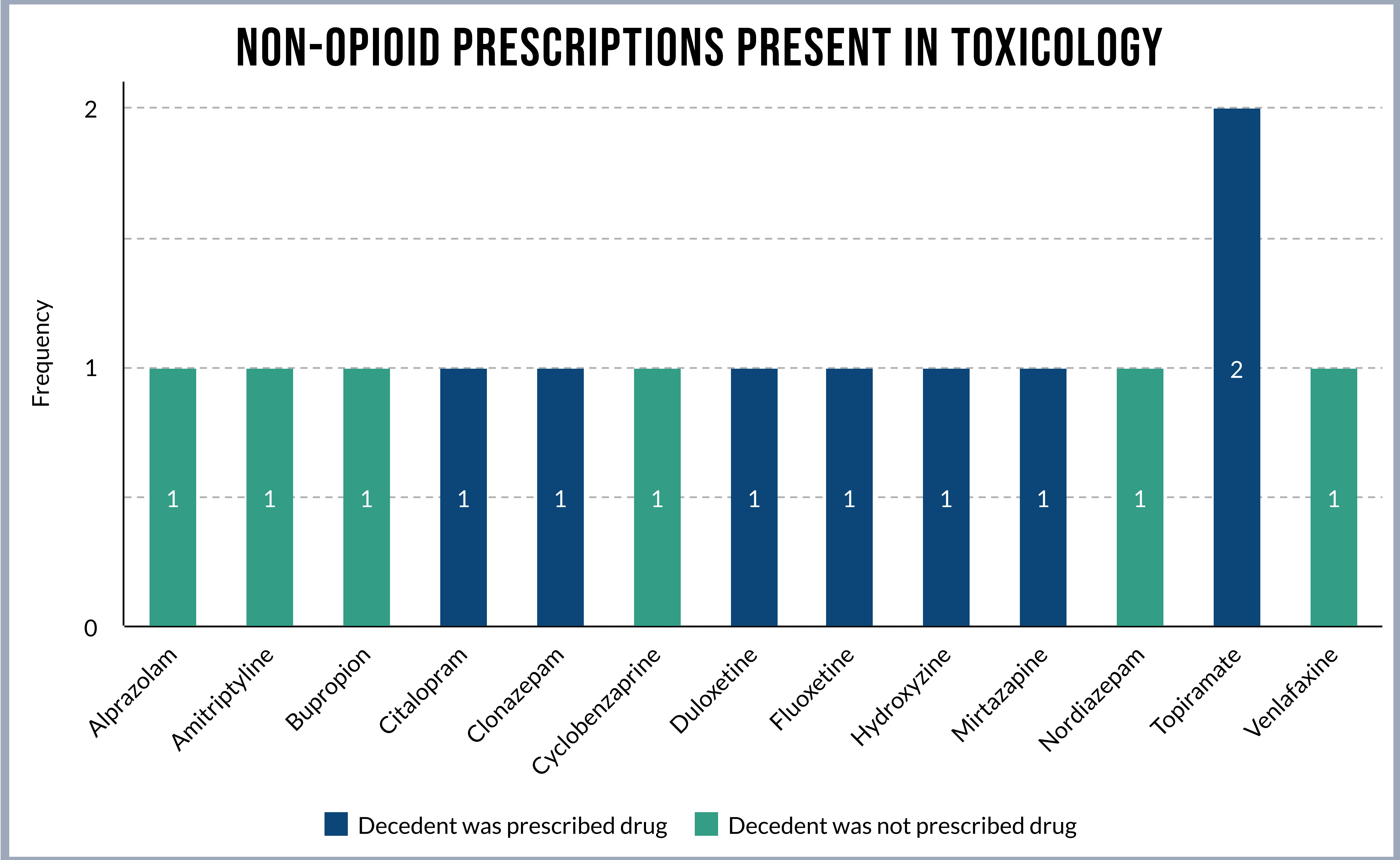


*Please see graphs on the next page for a list of opioid and non-opioid prescriptions.

Deaths Related to Opioids and Other Drugs

Mason, Leelanau, & Osceola County

Autopsy and Toxicology Results, cont.



Deaths Related to Opioids and Other Drugs

Mason, Leelanau, & Osceola County

Highlights

OPIOIDS AND POSITIONAL ASPHYXIA

14% (2 of 14) of decedents who died due an opioid were originally found in a potentially airway compromising position

These positions include decedent drowning or decedent found face down on the floor, their bed, or on another surface

0% (0 of 3) of decedents who died due to only non-opioid substance(s) were originally found in a potentially airway compromising position

Opioids depress the respiratory system and when coupled with positional asphyxia, there may be an increase risk of death. This MEO suggests that those who use substances not use alone and to ensure they are not at risk for slumping forward onto their face.

NOVEL SUBSTANCES

Xylazine

1 death

- Only approved use is for veterinarian medicine in horses, cattle, etc.
- Used for sedation, anesthesia, muscle relaxation, and analgesia

Para-Fluorofentanyl

3 deaths

- Analogue of fentanyl that causes similar effects to fentanyl
- Reportedly more toxic than fentanyl but provides lower levels of pain mitigation
- No approved medical use in the United States

Acetyl-Fentanyl

2 deaths

- Analogue of fentanyl
- Stronger than morphine but weaker than fentanyl
- No approved medical use in the United States

SUBSTANCE COMBINATIONS

HEROIN & FENTANYL

0 decedents had heroin in their toxicology

XYLAZINE & FENTANYL

1 decedent had xylazine in their toxicology
This decedent also had fentanyl in their toxicology

BENZODIAZEPINES & OPIOIDS

2 decedents had a benzodiazepine and an opioid in their toxicology
Neither decedent were prescribed the opioid and benzodiazepine

METHAMPHETAMINE & OPIOIDS

12 decedents had methamphetamine and opioid(s) in their toxicology
11 decedents had methamphetamine and fentanyl in their toxicology