Department of Forensic Pathology

Office of the Medical Examiner

2018 Drug Report

Introduction

Drug-Related Deaths - Defined

We define drug deaths as those which result entirely or partially from the physiologic effects of acute toxicity. Therefore, included here are deaths which resulted from a combination of natural disease and acute intoxication (e.g. lung disease complicated by opioid intoxication). Our definition does not include deaths by violence, in which the violent behavior may have been caused or contributed to by intoxication (e.g. death due to injury from motor vehicle crash in which the at-fault driver was intoxicated). We also do not include deaths related to the effects of chronic substance use (e.g. deaths due to alcoholic liver disease or heart disease which may have been contributed to by chronic cocaine use) if not combined with acute toxicity.

Methods

The majority of the drug deaths reported are due to more than one substance, as you will see in the detailed tables that follow. Often, decedents have even more substances present in their body at the time of death or overdose incident than just the substances listed as having caused or contributed to death. After autopsy and review of records, including toxicology report, the medical examiner assigned to the case determines which of the substances present played a causal role in the death. Thus, there may be substances present in a given case which are not included in the cause of death statement.

Occasionally, intoxicated decedents survive in the hospital for a time prior to death, following acute drug intoxication. In these cases, all efforts are made to obtain and test the earliest blood and urine available from their time in the hospital for the overdose incident, so that the toxicology results reflect what was in the body at the time the overdose occurred.

New information occasionally becomes available after a "final" cause of death was determined, which sometimes, albeit rarely, results in a change to the "final" cause of death. As such, the statistics contained herein may be subject to change at any time.

The extent of toxicology testing is determined by the medical examiner assigned to the case, based upon the circumstances of death. During the period reported, our office used Axis Forensic Toxicology for toxicology testing.[1]

Manner Determination

Drug-related deaths are conventionally certified as accidents (unless otherwise indicated by investigation on a case by case basis) and rarely, if ever, Homicide. A decedent's intentions in the interval immediately preceding death may be impossible to ascertain. A common example is a person who has a well-documented history of suicidal ideation or attempts but also abuses drugs recreationally. In such cases a fatal overdose may be intentional or unintentional, and therefore may be best certified as indeterminate.

[1] If you have questions about what drugs we are currently capable of detecting, please visit www.axisfortox.com or email michelle.fox@sparrow.org

Highlights

Unless otherwise noted, all comparisons here are made to the data from 2017. As stated above, most drug-related deaths are due to a combination of more than one substance. As such, numerous deaths fall into multiple of the below statistical categories (i.e. *all* heroin, fentanyl, methadone, and fentanyl analogue-related deaths are included in the opioid-related deaths category, and many deaths involved both heroin and fentanyl, and are included in both specific categories).

- Total drug-related deaths **increased** by 5.9% (9 more)
- Opioid-related deaths **remained unchanged** (0 more, 0 less)
- Heroin-related[2] deaths **decreased** by 11.4% (4 fewer)
- Fentanyl-related deaths **increased** by 45% (27 more)
- Methadone-related deaths **increased** by 27% (3 more)
- Cocaine-related deaths **increased** by 31% (10 more)
- Amphetamine/Methamphetamine-related[3] deaths **increased** by 53.8% (7 more)
- Fentanyl analogue-related deaths **increased** by 200% (12 more) with every acetylfentanyl death paired with fentanyl
- Benzodiazepine-related deaths **decreased** by 24.1% (14 fewer)
- Fentanyl analogues identified as having caused or contributed to death in 2018 included: acetylfentanyl (16), valerylfentanyl (2), despropionyl fentanyl (1), and methoxyacetyl fentanyl (1)
- **81.4%** of all drug-related deaths were due to two or more substances (+.5% from 2017)
- **29.6%** of all opioid-related deaths also involved at least one benzodiazepine (-13.6% from 2017)
- **13.6%** of all opioid-related deaths also involved ethanol (alcohol) (-4% from 2017)

[2] Heroin is rapidly metabolized to morphine. As such, this may result in some under-reporting of heroin, and over-reporting of morphine

[3] Methamphetamine is metabolized to amphetamine in the body, thus, it is not always clear what the presence of amphetamine indicates (illicit methamphetamine use vs. prescription amphetamine use)

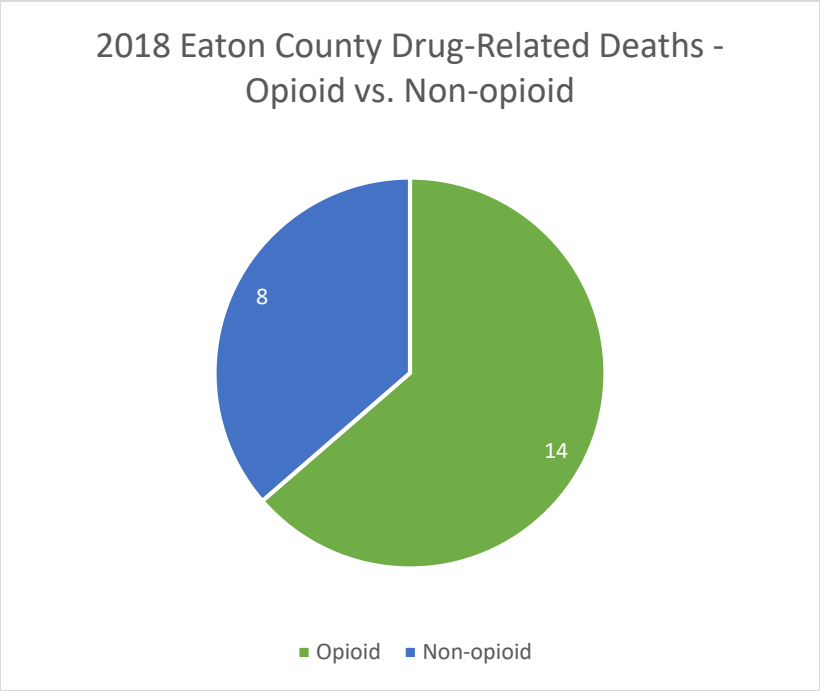
Eaton County

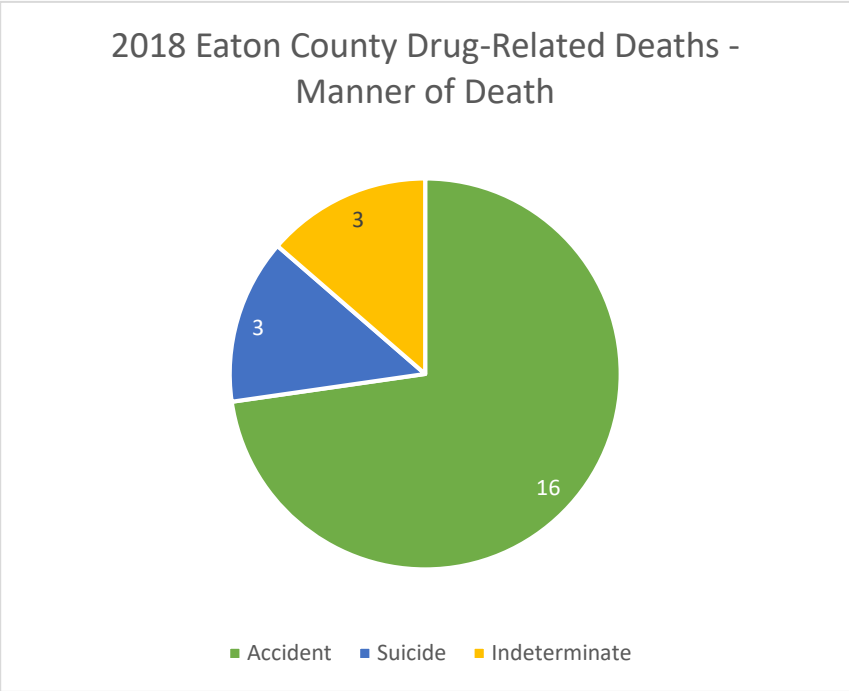
Drug-Related Deaths

2018 Eaton County Drug-Related Deaths			
Sex	**Age**	**Substance(s) Causing Death**	**Manner of death**
Female	23	fentanyl, flurazepam, hydroxyzine	Accident
Male	27	clonazepam, ethanol, fentanyl, fluoxetine	Accident
Female	33	fentanyl, heroin, cocaine	Accident
Male	34	fentanyl, cocaine	Accident
Female	36	methadone, alprazolam, cocaine	Accident
Male	38	Heroin, Alprazolam, Bupropion, Sertraline, Gabapentin	Indeterminate
Male	44	alprazolam, ethanol	Accident
Female	45	alprazolam, diazepam, oxycodone, dextromethorphan, promethazine, fluoxetine	Indeterminate
Female	49	cocaine	Accident
Female	49	Levetiracetam, Dextromethorphan, Doxylamine	Indeterminate
Male	50	ethanol	Accident
Female	51	escitalopram, ethanol, gabapentin, lorazepam	Accident
Female	53	oxycodone	Suicide
Female	56	heroin, methadone, alprazolam	Accident
Male	57	cocaine	Accident
Male	58	Fentanyl, Citalopram, Amitriptyline, Topiramate	Accident
Male	60	Ethanol	Accident
Male	62	fentanyl, methadone, morphine	Accident
Male	62	amitriptyline, oxycodone	Accident
Male	63	acetylfentanyl, ethanol, fentanyl, methamphetamine	Accident
Female	69	alprazolam, zolpidem, fluoxetine	Suicide
Female	70	cyclobenzaprine, hydrocodone, tramadol, trazodone, venlafaxine	Suicide

Eaton County

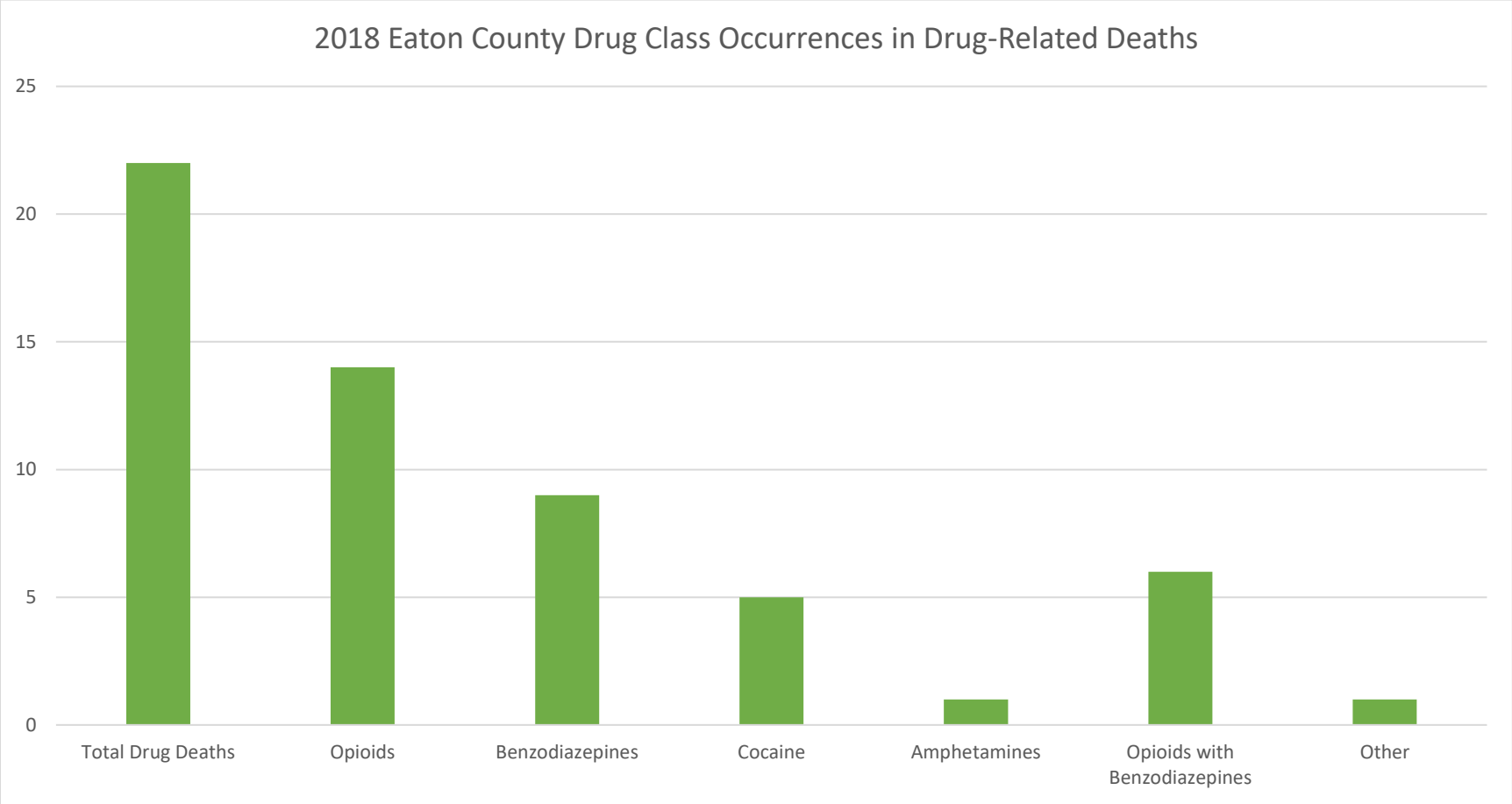
Drug-Related Deaths





Eaton County

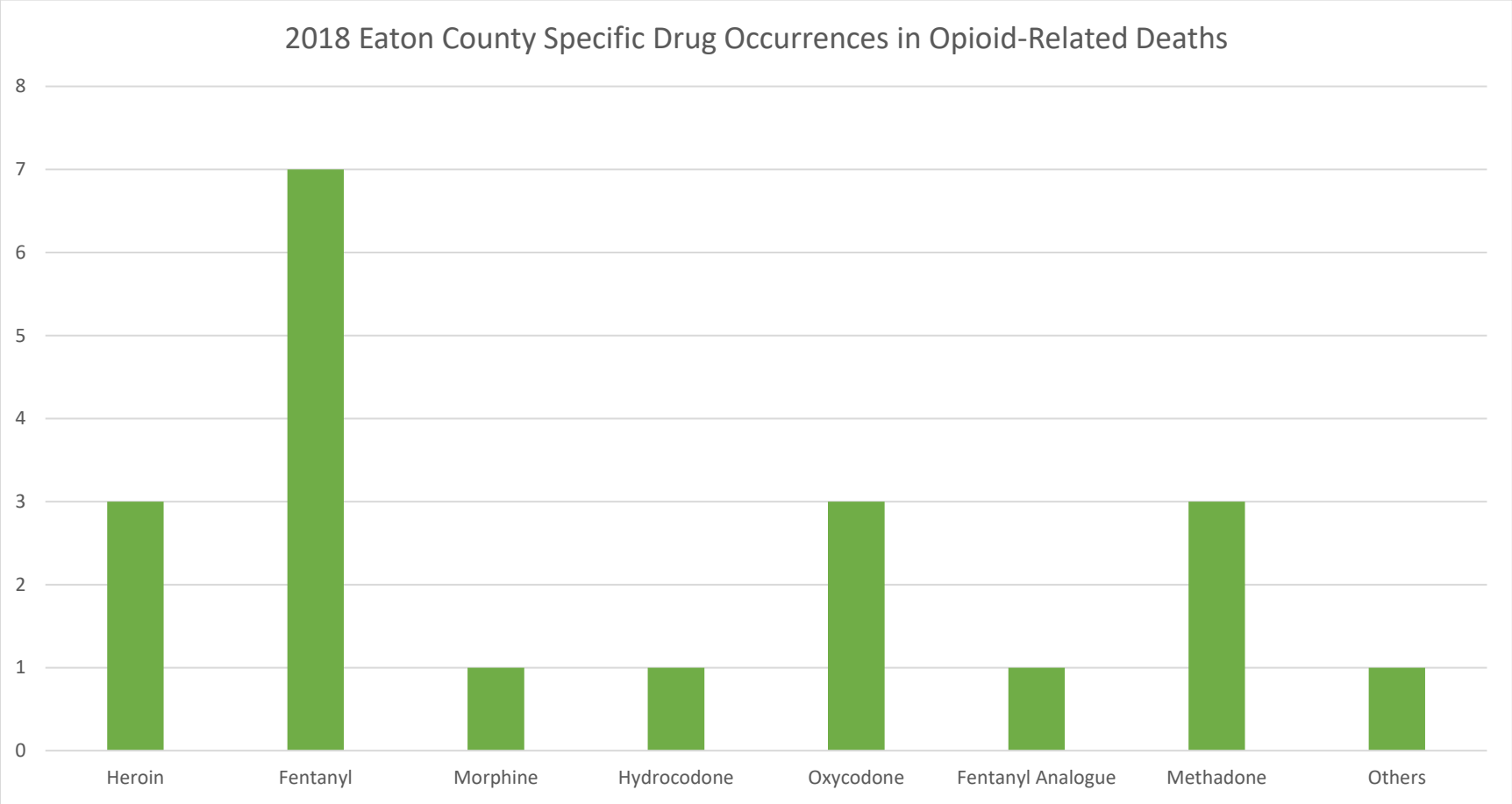
Drug-Related Deaths



This chart describes occurrences in one death of a given class of drug. As most drug-related deaths are due to two or more substances, the same death may fall into multiple categories (e.g. death due to fentanyl and alprazolam intoxication falls into the opioids, benzodiazepines, and opioids with benzodiazepines categories). Multiple of the same class of drug in the same death counts as only one occurrence of that class of drugs (e.g. death due to fentanyl and hydrocodone intoxication – both of these are opioids so this death falls only in the opioids category, as one occurrence). The "other" category is for occurrences of drug-related deaths due *solely* to drugs which do not fall into the other listed categories.

Eaton County

Drug-Related Deaths



This chart describes occurrences in one death of a specific opioid drug. As most drug-related deaths are due to two or more substances, the same death may fall into multiple categories (e.g. death due to fentanyl and heroin intoxication falls into both the fentanyl and heroin categories). The "other" category is for occurrences of other less-frequently observed opioids, including (but not limited to) tramadol, hydromorphone, buprenorphine.

Eaton County

Drug-Related Deaths

This chart reflects drug related deaths investigated by the Eaton County Medical Examiner's Office where the location of death occurred inside of the county lines. It does not reflect the county of residence, where the decedent was found or pronounced, or their final disposition location.

Ingham County

Drug-Related Deaths

2018 Ingham County Drug-Related Deaths			
Sex	**Age**	**Substance(s) Causing Death**	**Manner of death**
Female	19	ethanol, fentanyl	Accident
Male	21	opioids (fentanyl), benzodiazepines	Accident
Male	21	alprazolam, oxycodone, promethazine	Accident
Male	22	fentanyl, tapentadol, mitragynine, dextromethorphan	Accident
Male	24	heroin	Accident
Male	25	fentanyl	Accident
Female	25	diphenhydramine, fentanyl	Accident
Male	27	alprazolam, fentanyl, morphine (probable heroin)	Accident
Female	27	acetylfentanyl, cocaine, diphenhydramine, ethanol, fentanyl	Accident
Male	28	clonazepam, ethanol, fentanyl, gabapentin, morphine	Accident
Male	28	heroin, clonazepam	Accident
Male	28	fentanyl	Accident
Male	28	fentanyl	Accident
Female	28	fentanyl, heroin, acetylfentanyl, valerylfentanyl, cocaine, alprazolam, diphenhydramine	Accident
Male	28	fentanyl, morphine, hydrocodone, cocaine	Accident
Male	28	ethanol, fentanyl, heroin	Accident
Male	29	ethanol	Accident
Male	29	benzodiazepine	Accident
Male	29	heroin, butane	Accident
Male	30	methamphetamine	Accident
Male	30	fentanyl	Accident
Female	31	fentanyl, methadone, diphenhydramine	Accident
Male	31	fentanyl, cocaine, ethanol	Accident

Ingham County

Drug-Related Deaths

Female	32	cocaine, cyclobenzaprine, ethanol, heroin	Accident
Male	32	acetylfentanyl, fentanyl, methamphetamine	Accident
Female	32	alprazolam, clonazepam, fentanyl, and heroin	Accident
Female	32	diphenhydramine, ethanol, fentanyl	Accident
Male	32	cocaine, ethanol	Accident
Female	33	doxepin, methadone, alprazolam, clonazepam, gabapentin, citalopram	Indeterminate
Male	33	fentanyl	Accident
Male	34	acetylfentanyl, fentanyl	Accident
Male	34	alprazolam, clonazepam, fentanyl, fluoxetine, gabapentin, heroin	Accident
Male	34	fentanyl, cocaine	Accident
Male	34	acetylfentanyl, alprazolam, diphenhydramine, fentanyl, methamphetamine	Accident
Male	34	cocaine, fentanyl	Indeterminate
Male	34	fentanyl	Accident
Male	35	diphenhydramine, fentanyl	Accident
Male	36	fentanyl	Accident
Male	36	diazepam, ethanol, oxycodone	Accident
Female	36	fentanyl, cocaine	Accident
Female	37	heroin, cocaine, ethanol	Accident
Male	37	fentanyl, acetylfentanyl, morphine	Accident
Female	37	alprazolam, clonazepam, methadone	Accident
Male	38	fentanyl, heroin	Accident
Female	38	clonazepam, cocaine, dextromethorphan, duloxetine, fentanyl, heroin	Accident
Male	38	cocaine	Accident
Male	38	acetylfentanyl, fentanyl	Accident
Female	38	fentanyl, morphine, heroin, diphenhydramine	Accident
Female	39	cocaine, opiates	Accident

Ingham County

Drug-Related Deaths

Female	39	butalbital	Accident
Male	40	despropionyl fentanyl, fentanyl, heroin, methoxyacetylfentanyl	Accident
Male	40	fentanyl, heroin, Cocaine	Accident
Female	40	methamphetamine	Accident
Male	41	heroin, topiramate, venlafaxine	Accident
Male	41	cocaine, fentanyl, dihydrocodeine	Accident
Male	41	fentanyl, methamphetamine, cocaine	Accident
Male	41	heroin, ethanol	Accident
Female	41	fentanyl	Accident
Male	42	acetylfentanyl, fentanyl	Accident
Male	42	fentanyl, methamphetamine	Accident
Male	42	fentanyl, diphenhydramine	Accident
Male	43	cocaine, ethanol	Accident
Female	44	fentanyl, heroin, oxycodone	Accident
Male	44	fentanyl, methamphetamine	Accident
Male	44	fentanyl, methadone, cocaine	Accident
Male	45	alprazolam, amitriptyline, methadone, pregabalin	Accident
Female	45	methamphetamine	Accident
Male	46	cocaine	Accident
Female	47	heroin	Accident
Female	47	fluoxetine, hydroxyzine, trazodone	Indeterminate
Male	48	alprazolam, cyclobenzaprine, diphenhydramine, fentanyl, pregabalin	Accident
Female	48	methamphetamine, oxycodone	Accident
Male	49	fentanyl, ethanol	Accident
Female	50	alprazolam, amitriptyline, carbamazepine, carisoprodol, escitalopram, metoprolol, morphine, temazepam	Accident
Male	52	fentanyl, oxycodone	Accident

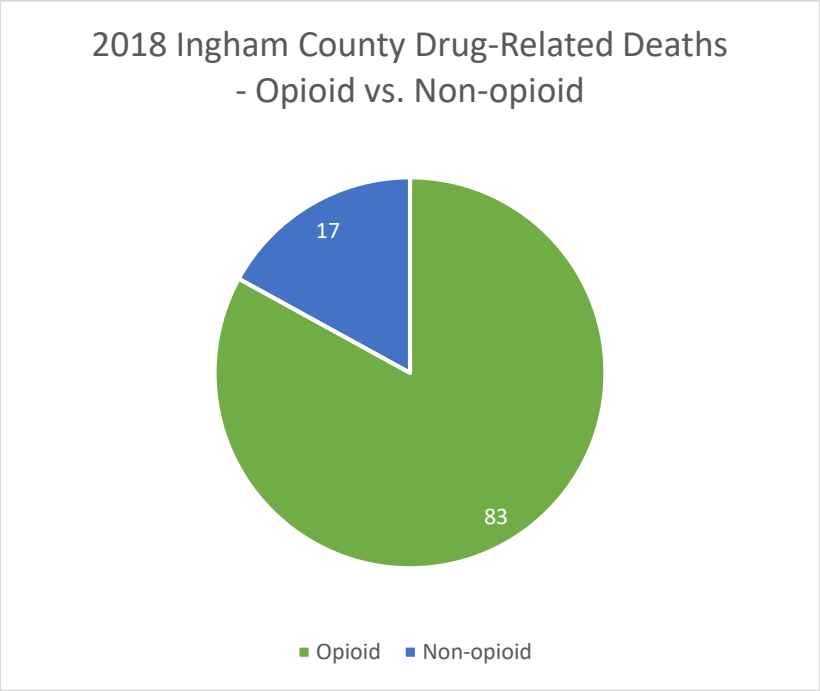
Ingham County

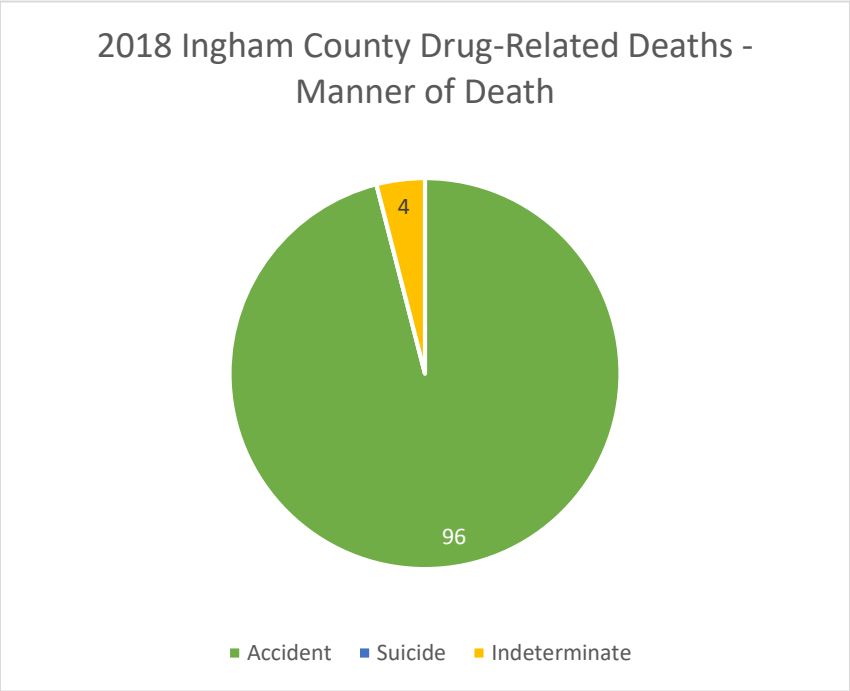
Drug-Related Deaths

Male	53	methamphetamine	Accident
Male	53	fentanyl, cocaine, ethanol	Accident
Female	53	cocaine, methadone, pseudoephedrine	Accident
Female	54	alprazolam, cyclobenzaprine, diphenhydramine, fentanyl, fluoxetine, gabapentin, oxycodone	Accident
Male	54	cocaine, diphenhydramine	Accident
Female	54	tramadol, clonazepam, cyclobenzaprine, gabapentin, amitriptyline	Accident
Female	54	cocaine	Accident
Male	54	acetylfentanyl, fentanyl	Accident
Female	55	heroin, clonazepam, cyclobenzaprine, gabapentin, duloxetine	Accident
Male	56	fentanyl, heroin, cocaine	Accident
Male	56	fluoxetine, fluvoxamine, olanzapine, clonazepam, zolpidem, oxcarbazepine	Accident
Female	57	clonazepam, alprazolam, methadone, gabapentin	Accident
Female	57	heroin, clonazepam, cyclobenzaprine, gabapentin. ethanol	Accident
Female	59	fentanyl, cocaine, diazepam, diphenhydramine, gabapentin	Accident
Female	60	amlodipine, diazepam, pregabalin, tramadol	Accident
Male	60	heroin, cocaine, ethanol	Accident
Male	60	hydrocodone, diazepam, gabapentin	Accident
Male	62	fentanyl, heroin, hydrocodone	Accident
Male	65	cocaine, fentanyl	Accident
Female	65	acetaminophen, codeine, ethanol, hydrocodone	Indeterminate
Male	69	heroin, fentanyl	Accident
Male	70	cocaine	Accident
Male	71	cocaine	Accident
Male	71	fentanyl	Accident
Male	72	heroin, fentanyl, cocaine, ethanol	Accident

Ingham County

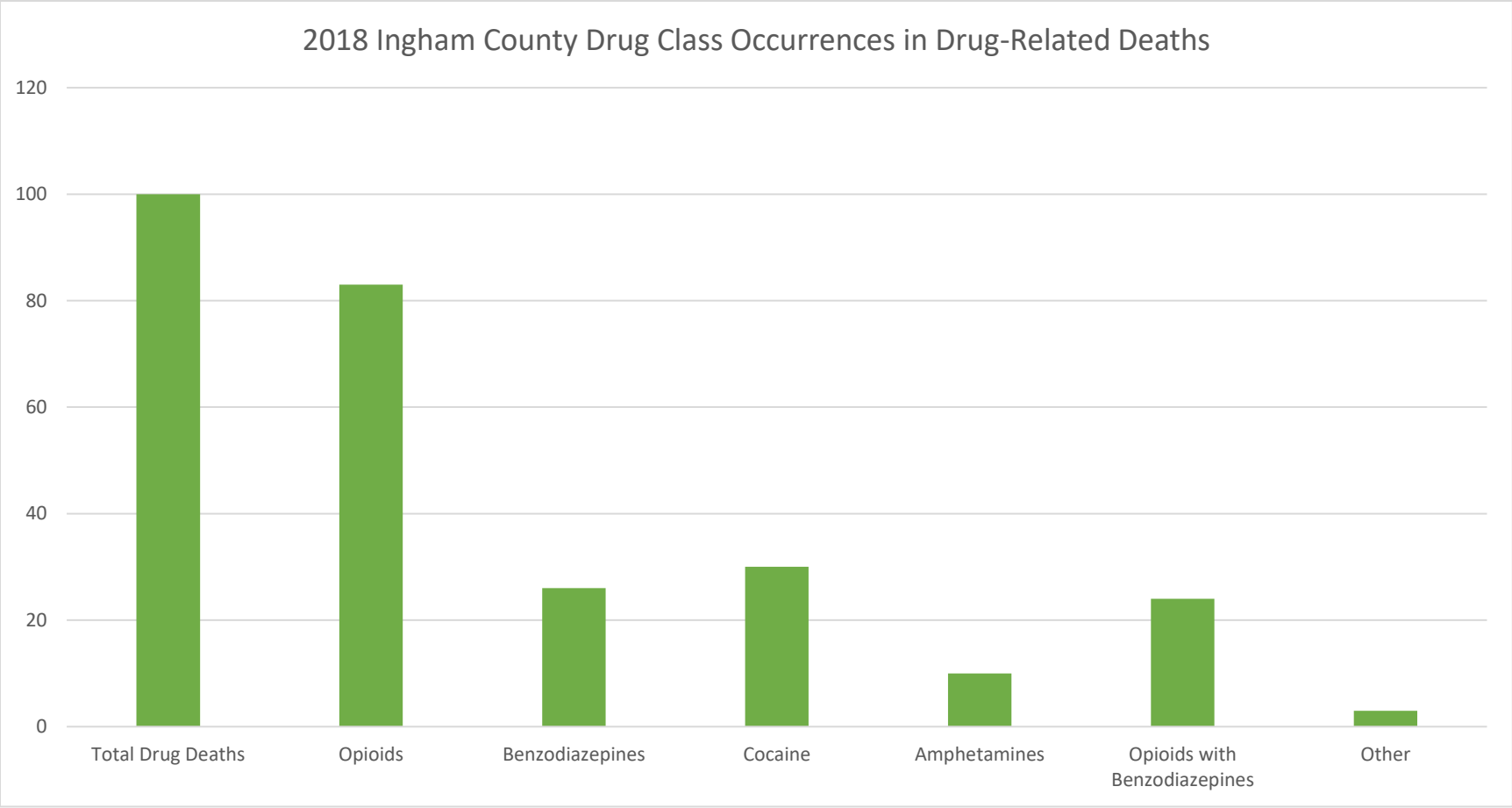
Drug-Related Deaths





Ingham County

Drug-Related Deaths



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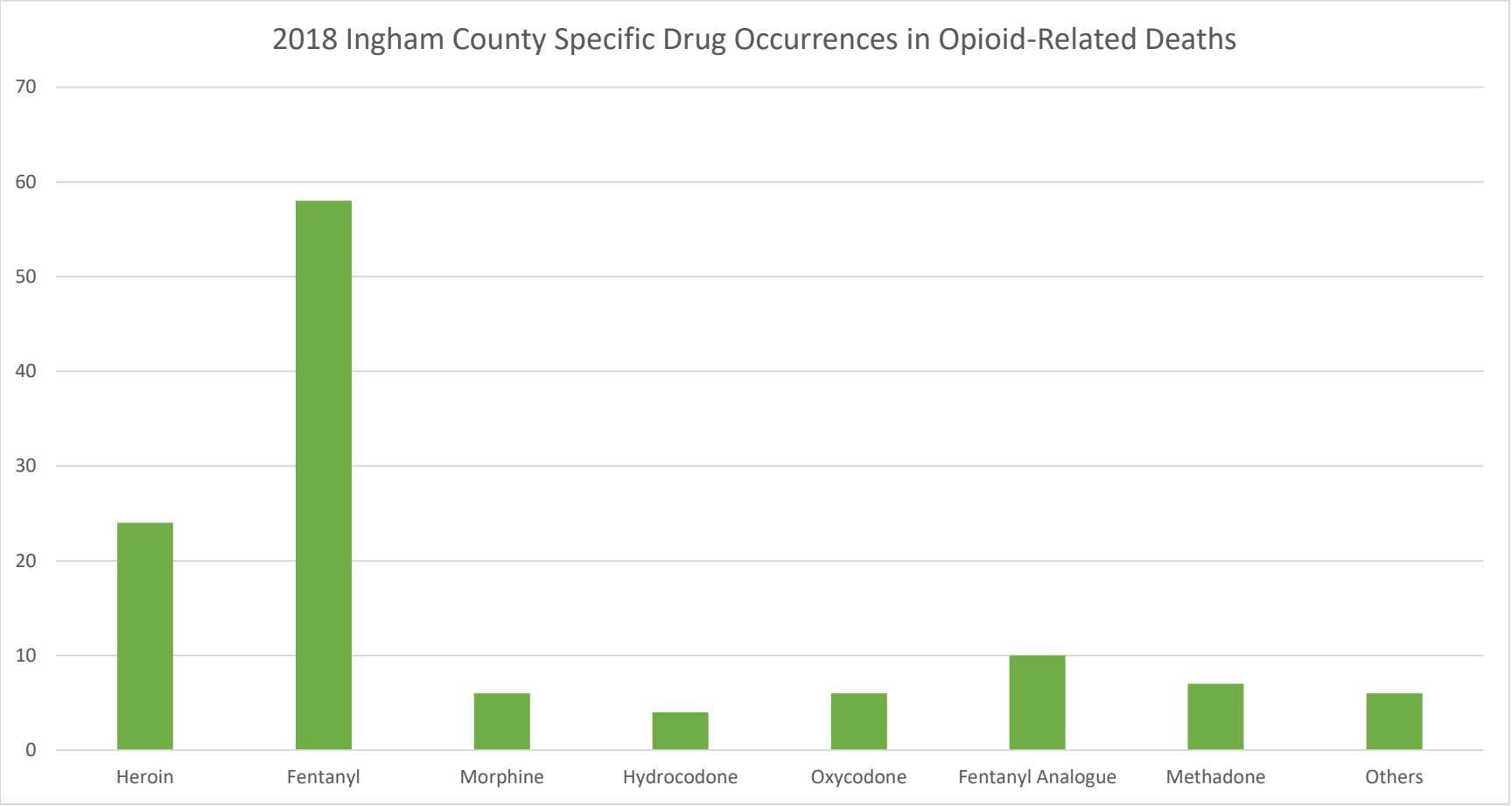
Ingham County

Drug-Related Deaths



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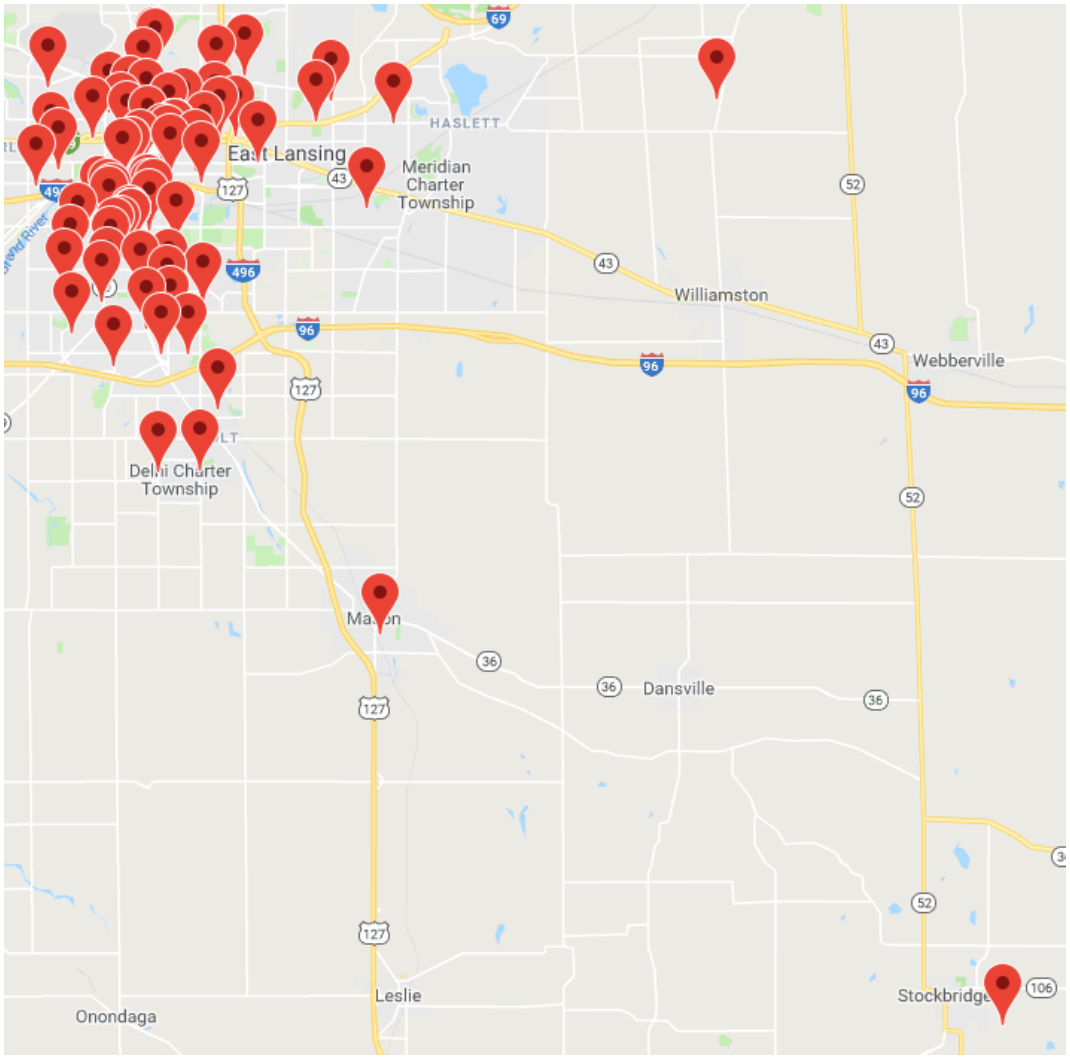
Ingham County

Drug-Related Deaths



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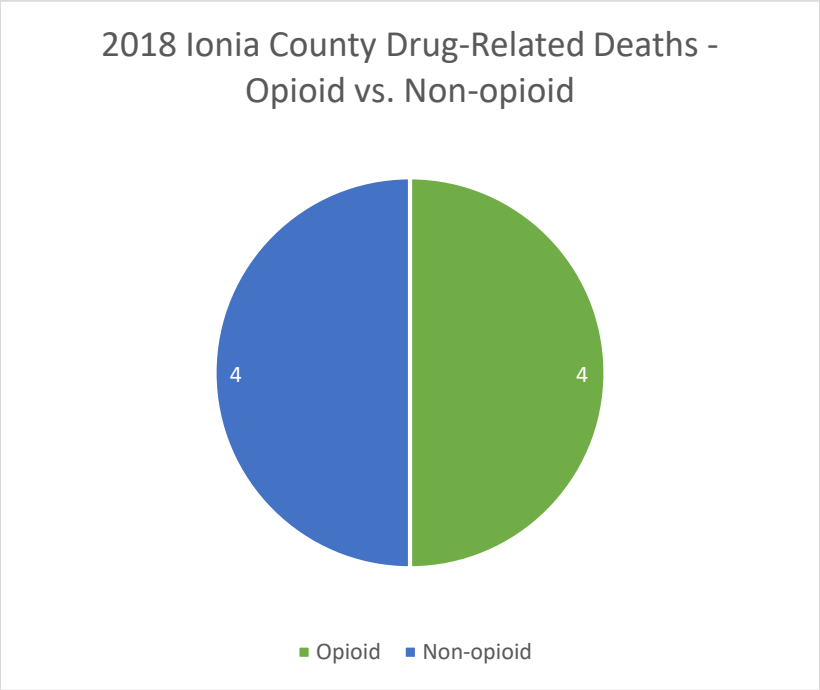
Ionia County

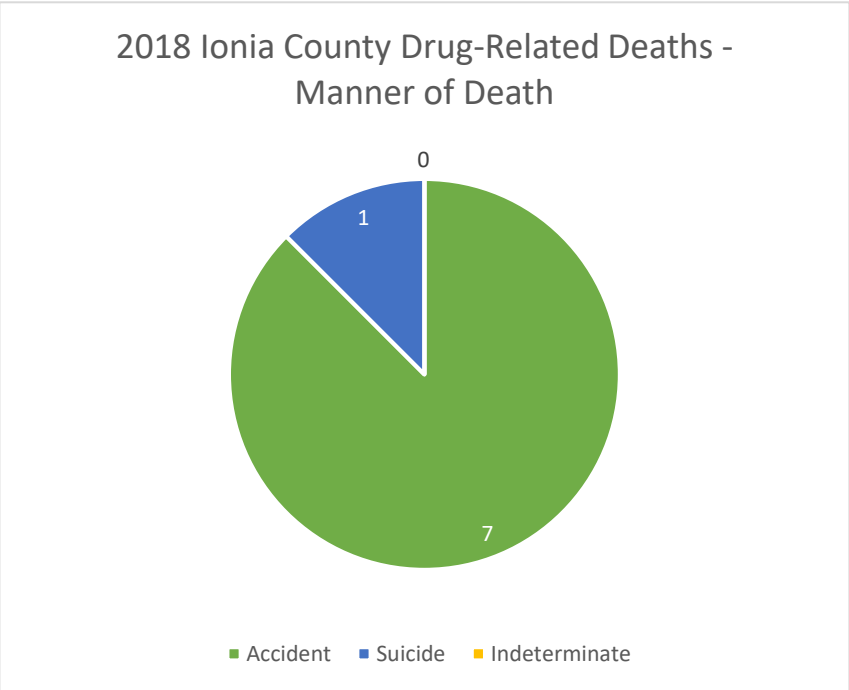
Drug-Related Deaths

2018 Ionia County Drug-Related Deaths			
Sex	**Age**	**Substance(s) Causing Death**	**Manner of death**
Female	25	fentanyl, valerylfentanyl	Accident
Male	29	ethanol, methamphetamine	Accident
Male	30	fentanyl, methamphetamine	Accident
Male	31	fentanyl, methamphetamine	Accident
Male	40	amitriptyline, duloxetine, paroxetine, sertraline	Suicide
Male	48	diphenhydramine, doxylamine, ephedrine, lorazepam, promethazine	Accident
Female	58	alprazolam, amitriptyline, diazepam, methadone	Accident
Male	64	1,1-difluoroethane	Accident

Ionia County

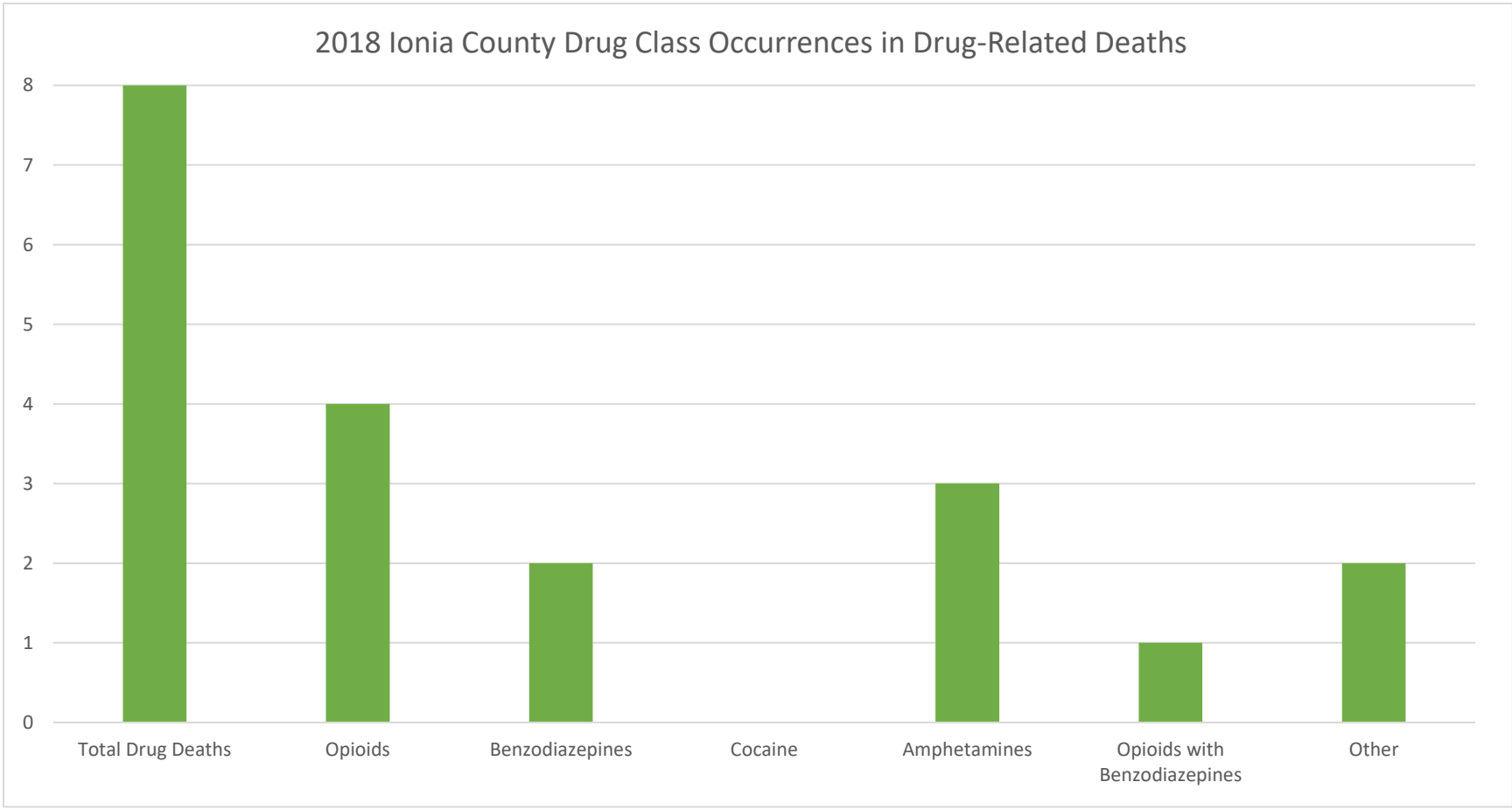
Drug-Related Deaths





Ionia County

Drug-Related Deaths



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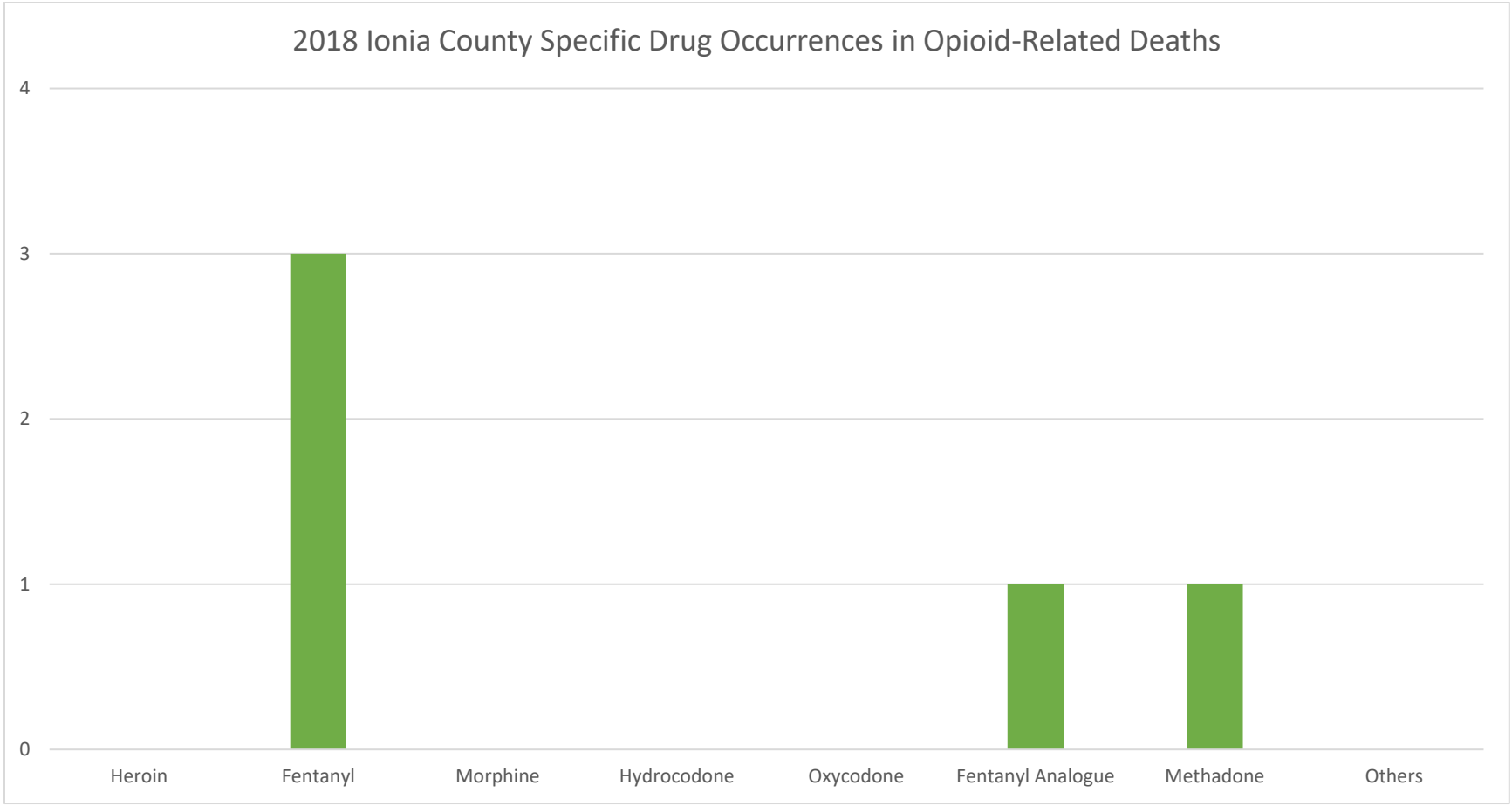
Ionia County

Drug-Related Deaths



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Ionia County

Drug-Related Deaths

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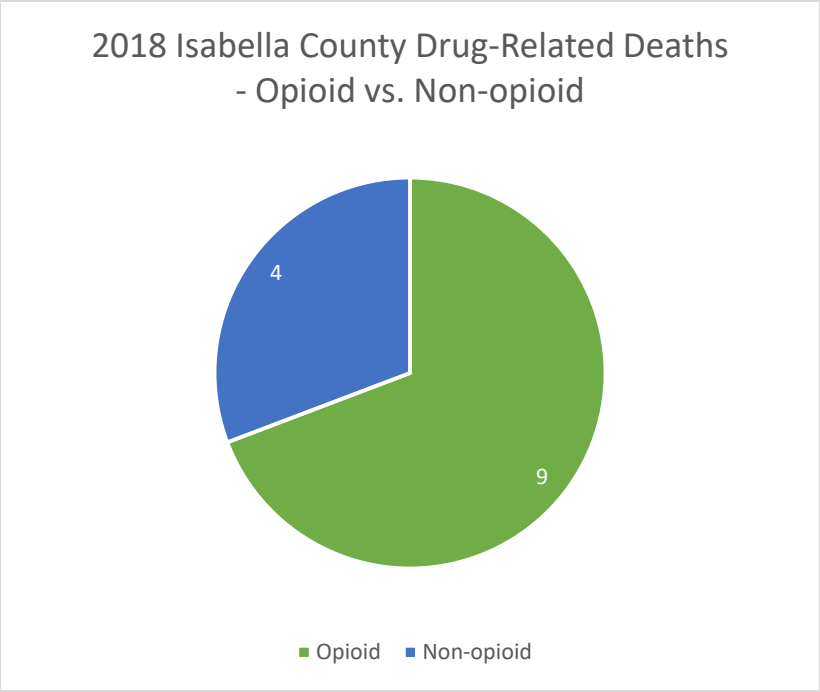
Isabella County

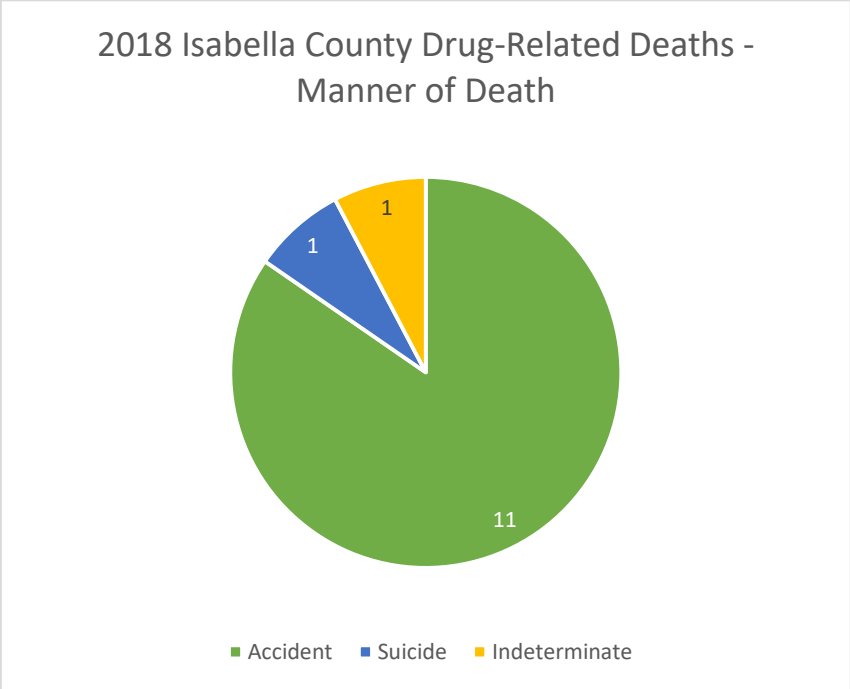
Drug-Related Deaths

2018 Isabella County Drug-Related Deaths			
Sex	**Age**	**Substance(s) Causing Death**	**Manner of death**
Male	19	alprazolam, tramadol	Indeterminate
Male	21	clonazepam, cyclobenzaprine, gabapentin	Accident
Female	22	fentanyl, cocaine	Accident
Female	23	bupropion	Suicide
Male	27	fentanyl	Accident
Female	27	fentanyl, methamphetamine	Accident
Female	35	cocaine	Accident
Male	38	amitriptyline, diphenhydramine, fentanyl	Accident
Male	39	fentanyl, methamphetamine	Accident
Female	44	cocaine, heroin	Accident
Male	51	cocaine, methadone, pregabalin, amitriptyline	Accident
Male	53	fentanyl, acetylfentanyl	Accident
Female	57	ethanol	Accident

Isabella County

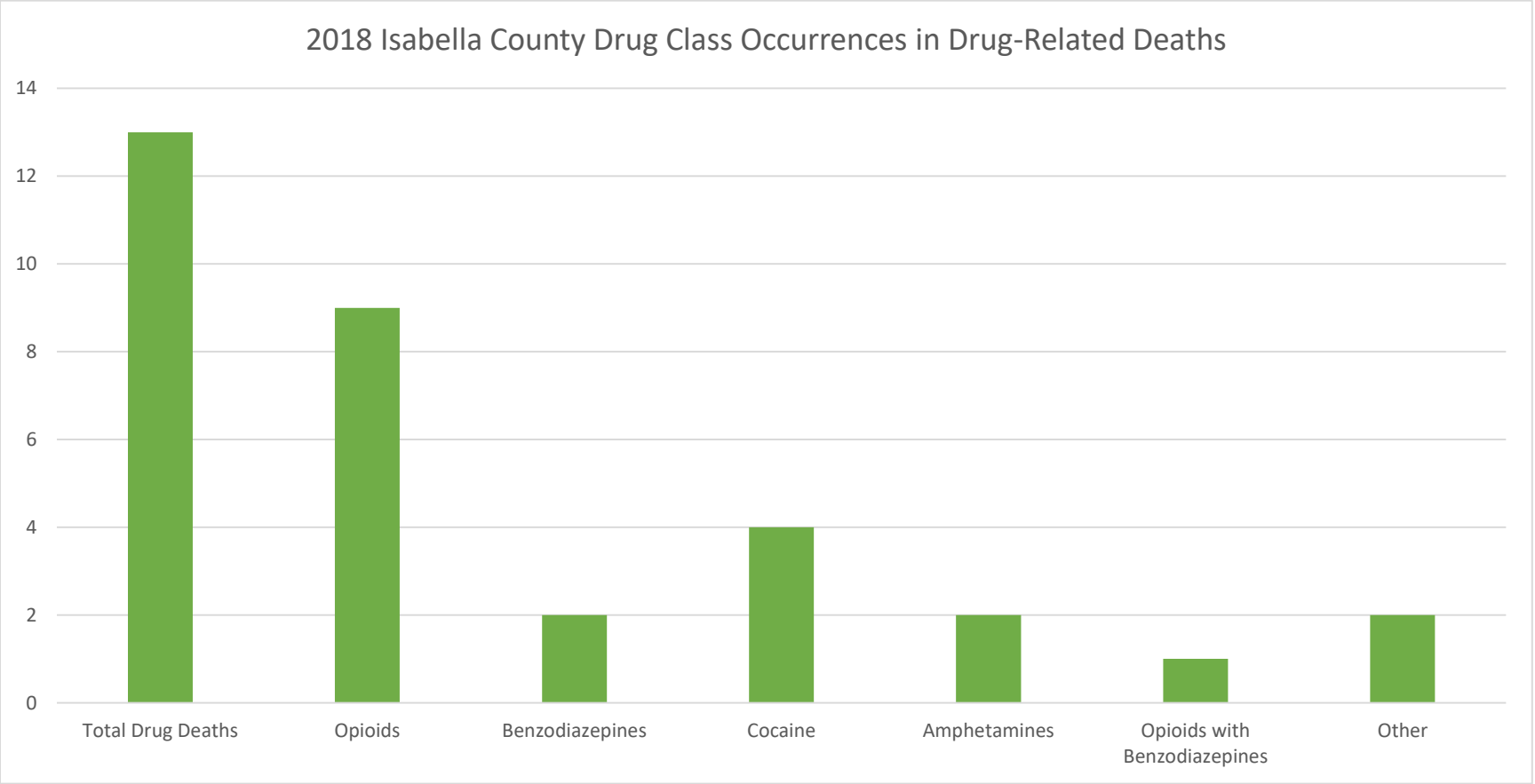
Drug-Related Deaths





Isabella County

Drug-Related Deaths



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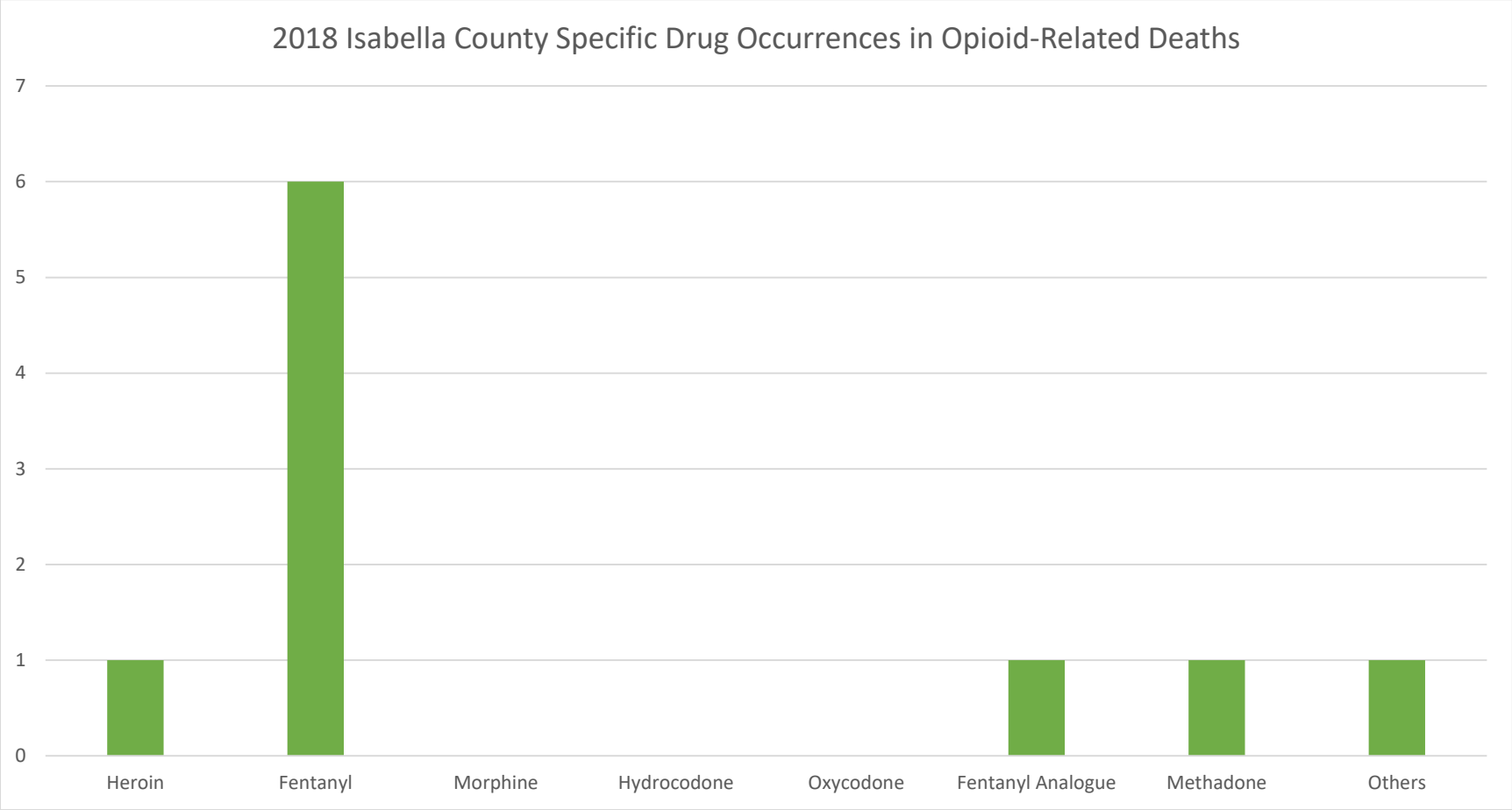
Isabella County

Drug-Related Deaths



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Isabella County

Drug-Related Deaths

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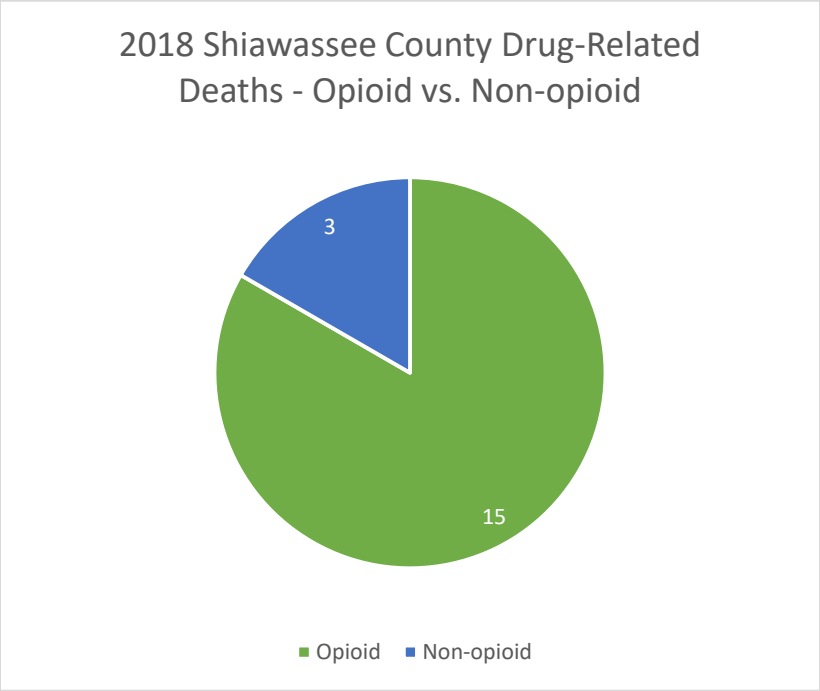
Shiawassee County

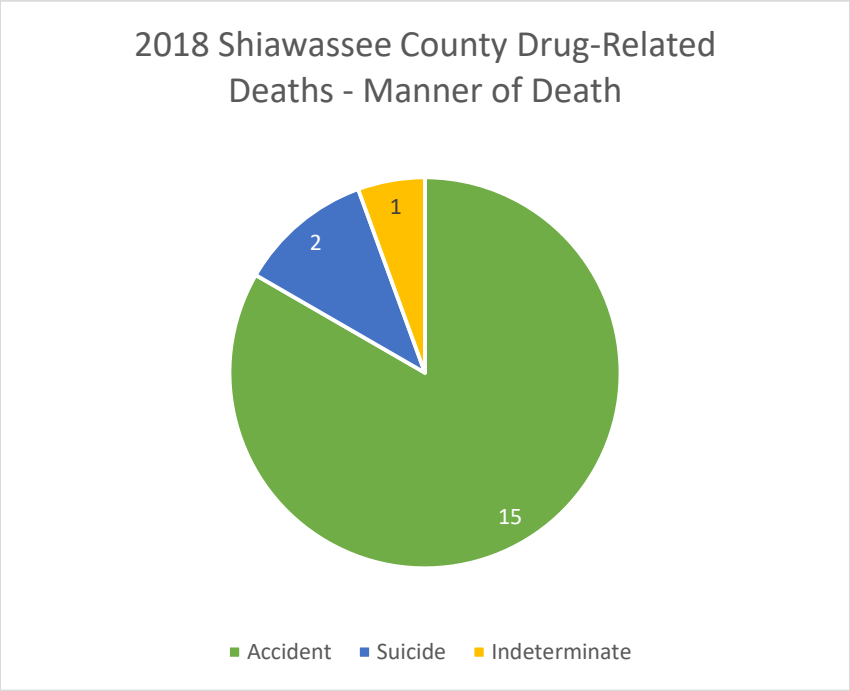
Drug-Related Deaths

2018 Shiawassee County Drug-Related Deaths			
Sex	**Age**	**Substance(s) Causing Death**	**Manner of death**
Female	27	acetylfentanyl, fentanyl	Accident
Male	31	fentanyl, methamphetamine, clonazepam	Accident
Male	33	fentanyl	Accident
Male	35	fentanyl, tramadol	Accident
Male	37	amitriptyline, dihydrocodeine, ethanol, fentanyl, hydrocodone, pregabalin	Accident
Male	38	fentanyl	Accident
Female	38	acetylfentanyl, clonazepam, cocaine, fentanyl	Indeterminate
Female	40	fentanyl, acetylfentanyl, alprazolam	Accident
Male	41	fentanyl, acetylfentanyl, alprazolam	Accident
Male	42	fentanyl, methadone, cocaine	Accident
Male	48	fentanyl, heroin, alprazolam	Accident
Female	48	acetylfentanyl, fentanyl, heroin	Accident
Male	50	ethanol, methamphetamine	Accident
Male	54	cocaine, fentanyl, amphetamine, probable heroin	Accident
Male	57	methadone, methamphetamine	Accident
Female	62	gabapentin	Suicide
Male	63	tramadol, gabapentin	Accident
Female	70	diphenhydramine, gabapentin, propranolol, venlafaxine	Suicide

Shiawassee County

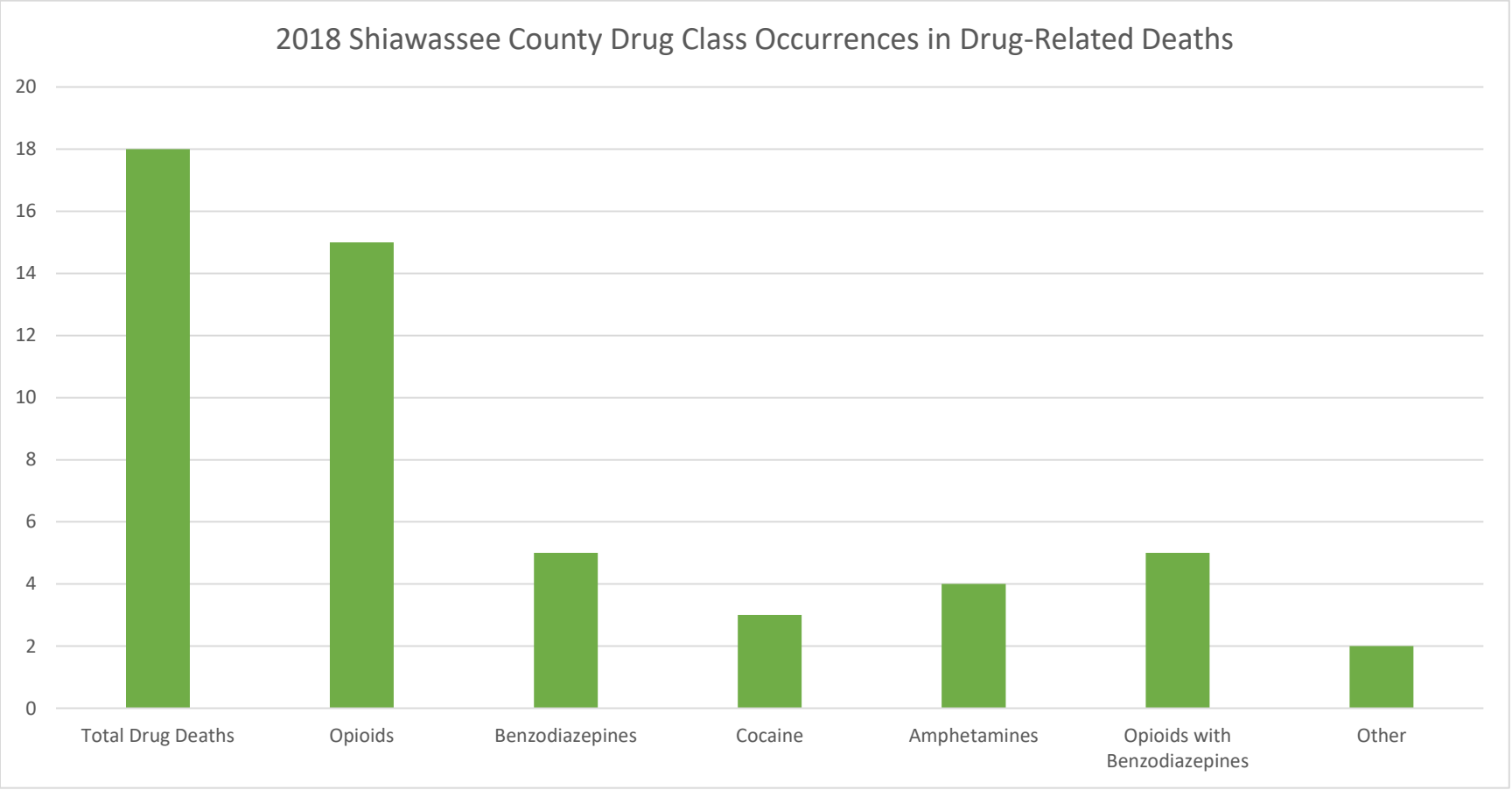
Drug-Related Deaths





Shiawassee County

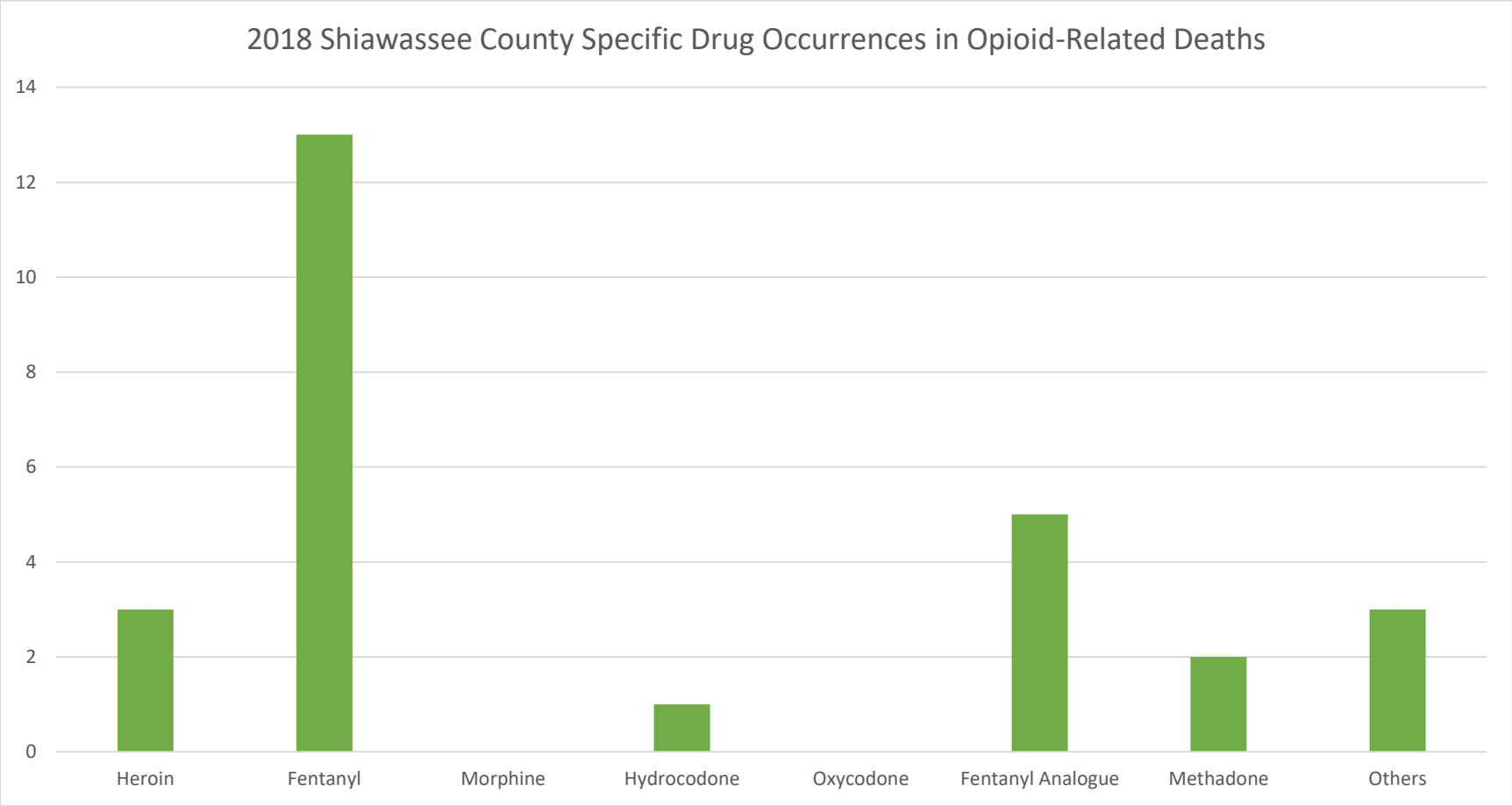
Drug-Related Deaths



This chart describes occurrences in one death of a given class of drug. As most drug-related deaths are due to two or more substances, the same death may fall into multiple categories (e.g. death due to fentanyl and alprazolam intoxication falls into the opioids, benzodiazepines, and opioids with benzodiazepines categories). Multiple of the same class of drug in the same death counts as only one occurrence of that class of drugs (e.g. death due to fentanyl and hydrocodone intoxication – both of these are opioids so this death falls only in the opioids category, as one occurrence). The "other" category is for occurrences of drug-related deaths due *solely* to drugs which do not fall into the other listed categories.

Shiawassee County

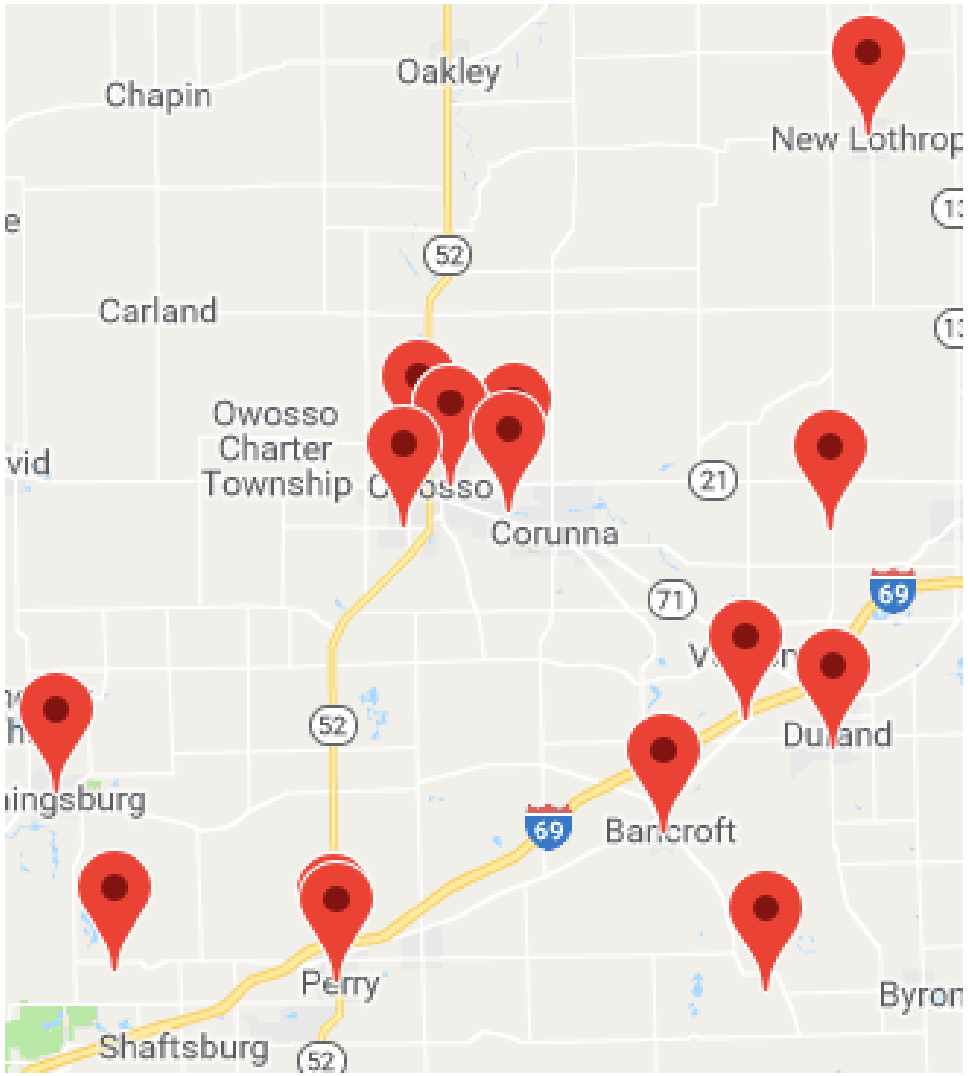
Drug-Related Deaths



This chart describes occurrences in one death of a specific opioid drug. As most drug-related deaths are due to two or more substances, the same death may fall into multiple categories (e.g. death due to fentanyl and heroin intoxication falls into both the fentanyl and heroin categories). The "other" category is for occurrences of other less-frequently observed opioids, including (but not limited to) tramadol, hydromorphone, buprenorphine, etc.

Shiawassee County

Drug-Related Deaths



This chart reflects drug related deaths investigated by the Shiawassee County Medical Examiner's Office where the location of death occurred inside of the county lines. It does not reflect the county of residence, where the decedent was found or pronounced, or their final disposition location.