



**KNOX COUNTY**  
REGIONAL FORENSIC CENTER

# 2020

## DRUG-RELATED DEATH REPORT

Knox and Anderson County, Tennessee

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[WWW.KNOXCOUNTY.ORG/RFC/](http://WWW.KNOXCOUNTY.ORG/RFC/)

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## From the Desk of **The Chief Medical Examiner** of Knox and Anderson Counties

The Regional Forensic Center team began tracking Drug-Related deaths more closely in 2016 as our data processing capabilities improved and the prescription opioids (especially oxycodone and oxymorphone, either legally prescribed or diverted) became the top two causes of drug intoxication deaths. As we began collaborating with a number of non-profit and governmental agencies to bring awareness to the perils of overprescribing, the numbers of overdoses started to drop. Our efforts finally paid off in 2019 as the overdose deaths began to decline. Unfortunately, 2020, the year of Coronavirus pandemic happened and the rest is history.

What made matters worse was a great number of addicted and physically dependent individuals who needed help either via medication-assisted treatment or psychological and physical rehabilitation, or both, were now left to their own devices. Business closures, job losses, social distancing, stress due to media amplified fears, economic hardship, socioeconomic unravelling of our communities, and lack of access to treatment modalities have not only negated all the hard-earned successes, but have led to a rise in the overall mortality from unnatural causes, including drugs.

Unfortunately, this report brings mostly bad news. In 2020, the Knox County overdose deaths increased 41% compared to 9.8% decrease in 2019. Raw data collected during the first quarter of 2021 projects a continued surge in Drug-Related deaths. Anderson County drug overdose deaths increased 82% in 2020, compared to the 11.6% decline in 2019. Mixed drug intoxications lead the way. Fentanyl, fentanyl analogues, and some of the novel synthetic opioids continue to be the most abused drugs. Among the stimulants, methamphetamine is the drug of choice either alone or in combination with opioids. Of note, alcohol has been more frequently abused in combination with other potent drugs than cocaine, oxycodone, oxymorphone, or even alprazolam.

In both counties under our jurisdiction, Anderson and Knox, young and middle age men continued to be disproportionately affected by drug overdose compared to women: 67% men versus 33% women in Knox County and 63% men versus 37% women in Anderson County. In more urban areas such as Knox County that includes the City of Knoxville, the ratio of black to white overdose deaths was 1 to 9, which reflected the community's demographic makeup.

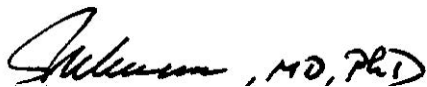
Last year we mentioned the emergence of novel opioids and benzodiazepines, such as isotonitazene and flualprazolam, respectively. Although isotonitazene has been replaced by other drugs, some novel such as metonitazene and some well-known such as LSD, flualprazolam and a potent new benzodiazepine flunitrazolam continue to pop up unexpectedly in addition to a very curious and not so novel substance, mitragynine. Mitragynine is one of many alkaloids found in kratom leaves, a tropical tree native to Southeast Asia. It is legally purchased in a number of venues in our country. Consumption of the crushed or pulverized leaves produces both stimulant effects in low doses and sedative effects in high doses. Kratom causes psychotic symptoms, tachycardia, hepatotoxicity, and seizures among other symptoms. Kratom consumption, alone or mixed with other drugs and/or alcohol, can lead to addiction and in higher concentrations death.



## 2020 Drug-Related Death Report

Snorting and smoking of drugs, and especially intravenous drug abuse continue to be the predominant modes of intake in drug intoxication deaths. Sadly, the combination of stronger drugs and direct modes of administration like injections directly into the blood stream make naloxone frequently ineffective. Moreover, Suboxone™ has become one of the most diverted and valuable/expensive drugs on the black market. Despite that, its widespread accessibility continues to be promoted by the healthcare community. The push for its widespread prescribing is a double-edged sword. With that in mind, it may be time to reevaluate many of the programs we have instituted, including the needle exchange program.

Sadly, it seems we have lost this last battle; but we have not lost the war. Recognizing what caused the setback and why it happened is the first step in reclaiming our recovery and regaining lost ground.



Darinka Mileusnic-Polchan, MD, PhD



# 2020 Drug-Related Death Report

## 2020 Key Findings

The overdose epidemic in Knox County, like that in the nation overall, continues to grow in magnitude, but is also changing in character<sup>1</sup>. In 2020, 413 people died from drug overdoses in Knox County compared to 293 in 2019 and 51 people died in Anderson County compared to 28 in 2019. Preliminary data for drug-deaths in 2021 unfortunately indicates an even more upward trend for drug-related death cases in Knox County. Drug overdose deaths increasingly involve synthetic opioids (fentanyl and fentanyl analogs) with decreasing numbers of prescription opioids (oxycodone, oxymorphone, hydrocodone, etc.).

## 2020 Report Highlights for Knox and Anderson Counties:

- Knox County had a 41% increase in drug-related deaths from 2019 to 2020.
- Anderson County had a 82% increase in drug-related deaths from 2019 to 2020.
- Fentanyl and fentanyl analogues (synthetic opioids) were the most frequently identified drugs in drug-related deaths in 2020.
- Polypharmacy, which is when more than one drug is responsible for death, was involved in 72% of Knox County and 80% of Anderson County overdose deaths.
- The five most common drugs identified in drug-related deaths in 2020 were synthetic opioids, methamphetamine, alcohol/ethanol, heroin, and cocaine.
- Prescription opioid-related deaths continue to decrease in our jurisdictions.
- People 35-44 years old experienced the most drug deaths in Knox County, but the sharpest increase was in individuals age 55-64.

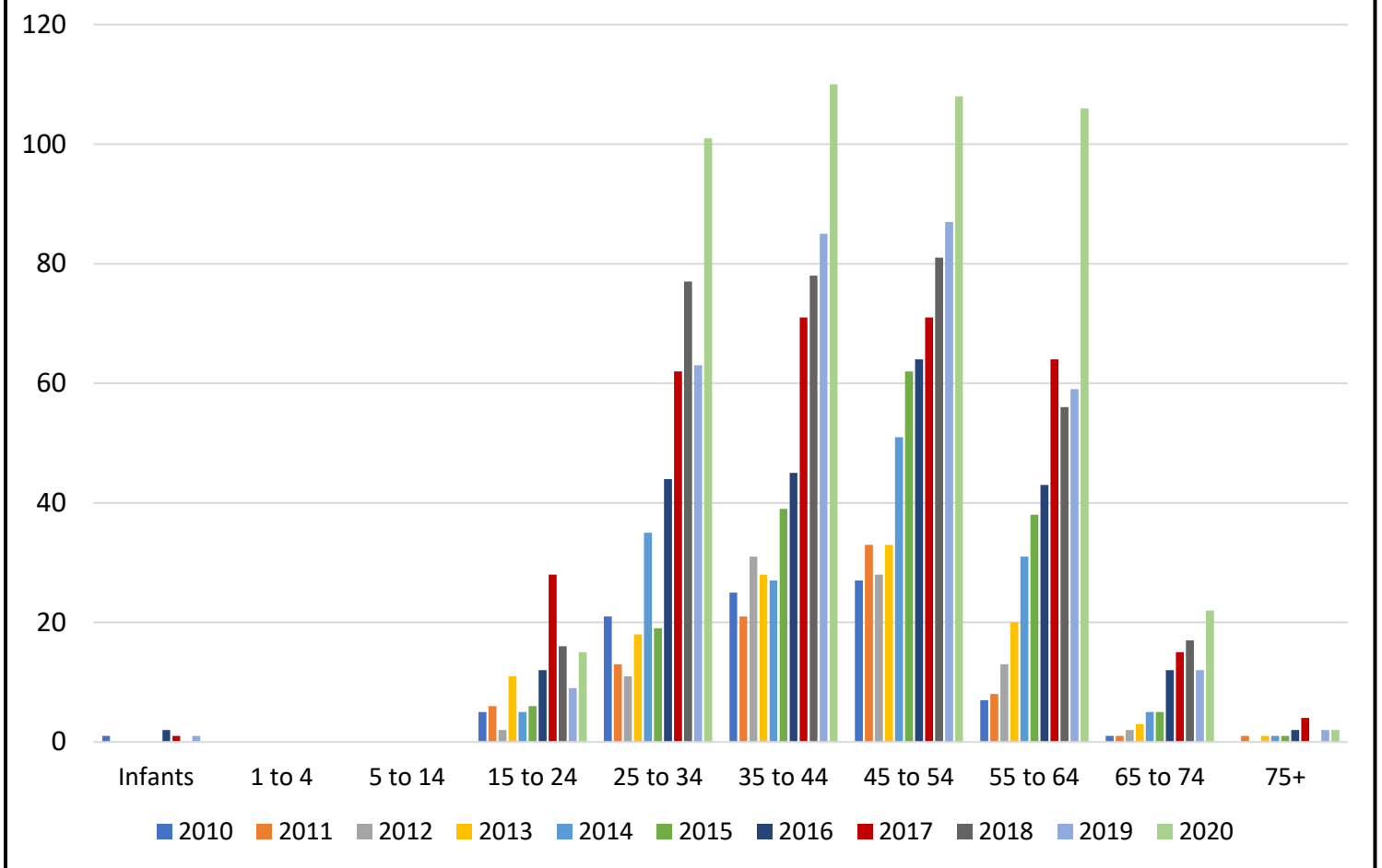
## Data and Methods

The Knox and Anderson County Medical Examiner database (MDILog) was queried for possible Drug-Related causes of death for cases accepted as medical examiner jurisdiction for Jan. 1, 2020, through Dec. 31, 2020. The initial query included non-motor vehicle accidents, undetermined, and suicide manners of death. The initial data set was examined to ensure that all included cases were drug-related deaths (as determined by the forensic pathologist of record). Causes of death related to chronic effects of drugs and alcohol (bacterial endocarditis, chronic ethanol use, etc.) were excluded from this dataset.

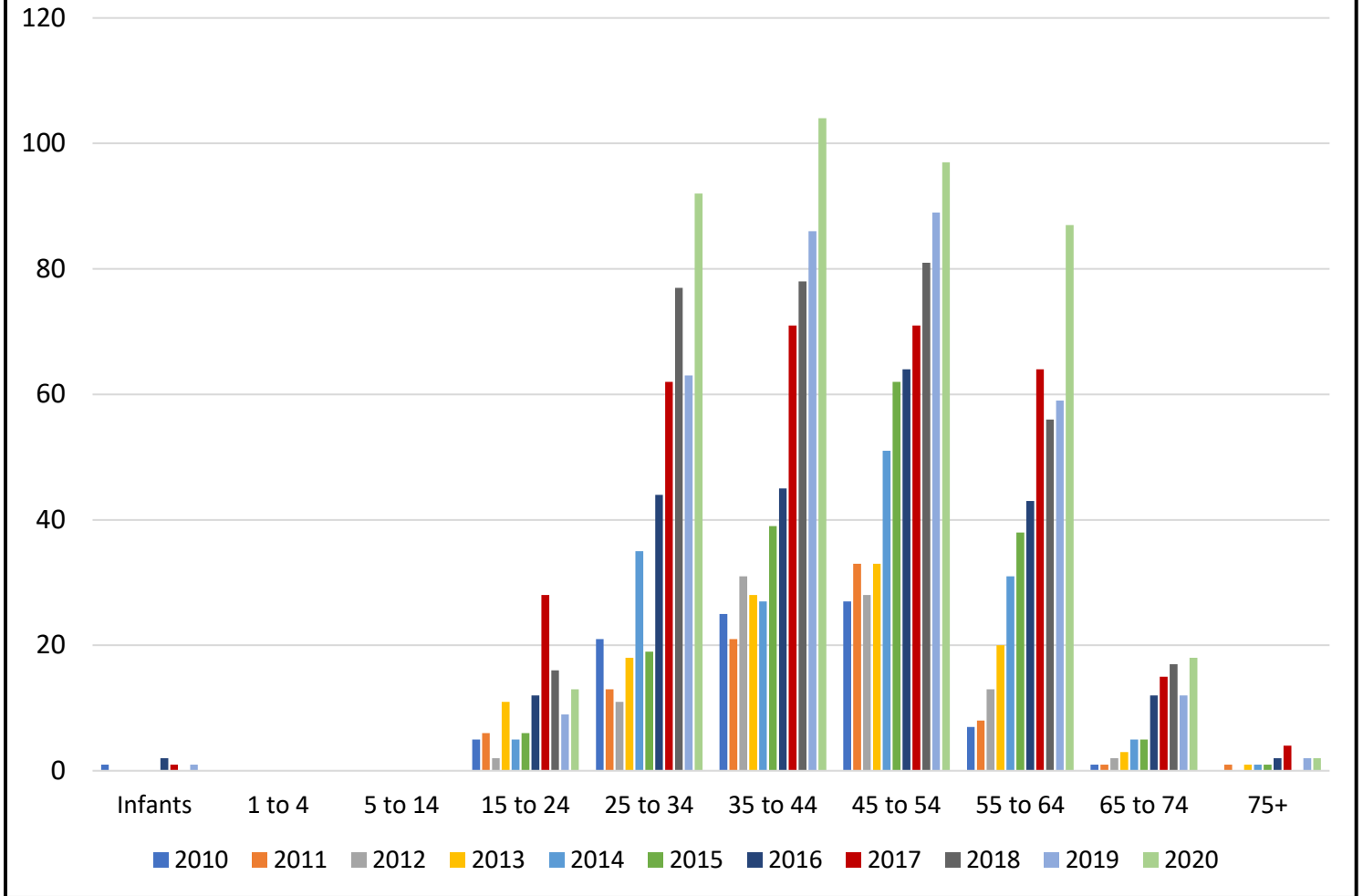
NIHCM 2020 <https://nihcm.org/publications/the-evolution-of-the-opioid-crisis-2000-2018>



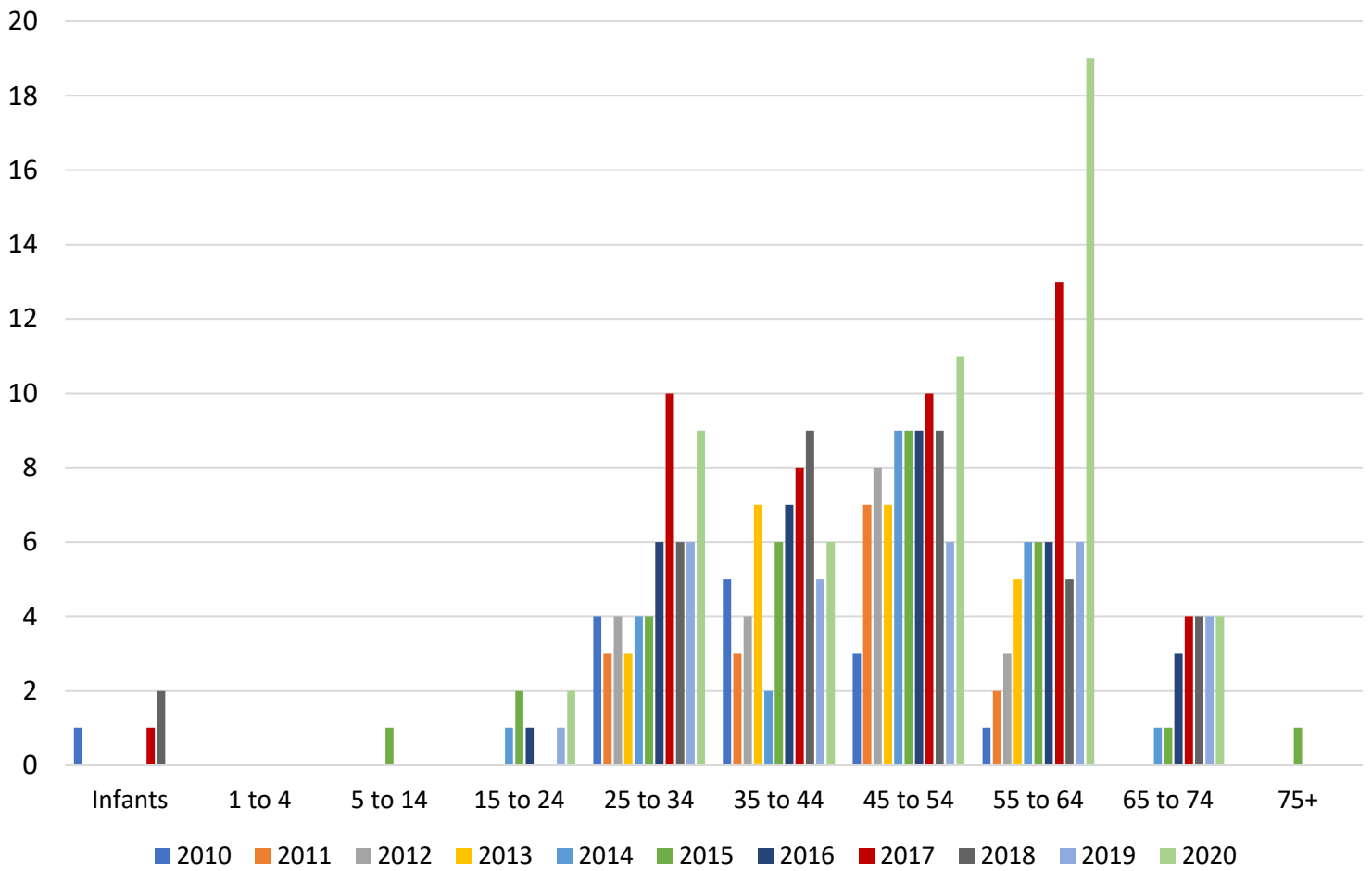
## Knox and Anderson Counties Age Distribution for Drug-Related Cases 2010-2020



## Knox County Age Distribution for Drug-Related Cases 2010-2020

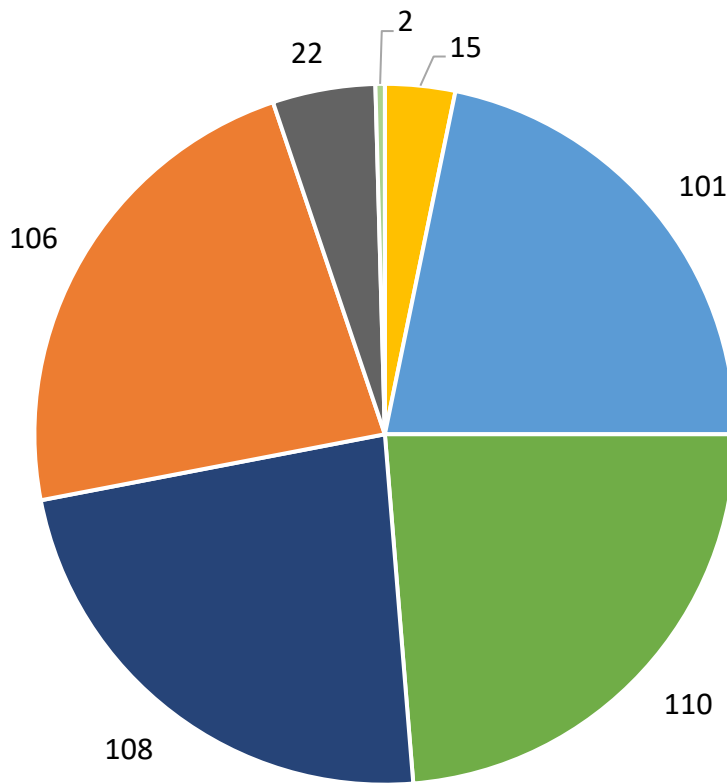


## Anderson County Age Distribution for Drug-Related Cases 2010-2020



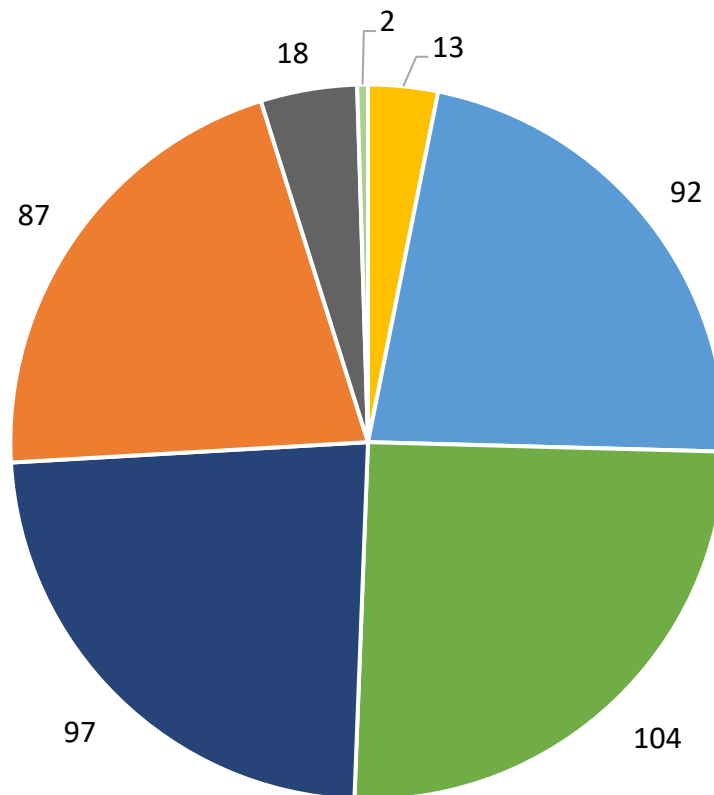


### Knox and Anderson Counties 2020 Drug-Related Deaths by Age Distribution



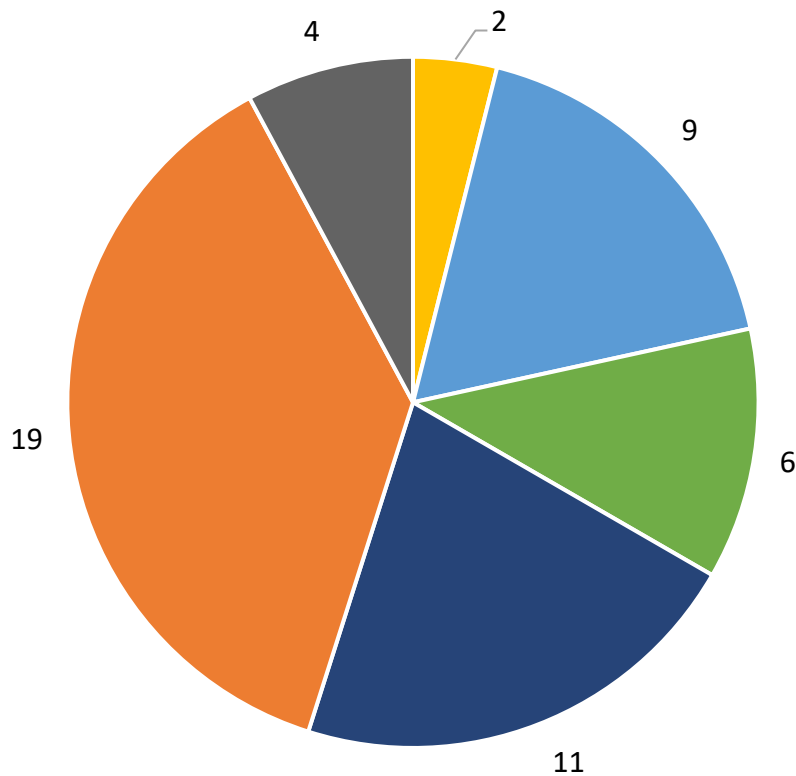
■ Infants ■ 1 to 4 ■ 5 to 14 ■ 15 to 24 ■ 25 to 34 ■ 35 to 44 ■ 45 to 54 ■ 55 to 64 ■ 65 to 74 ■ 75+

## Knox County 2020 Drug-Related Deaths by Age Distribution



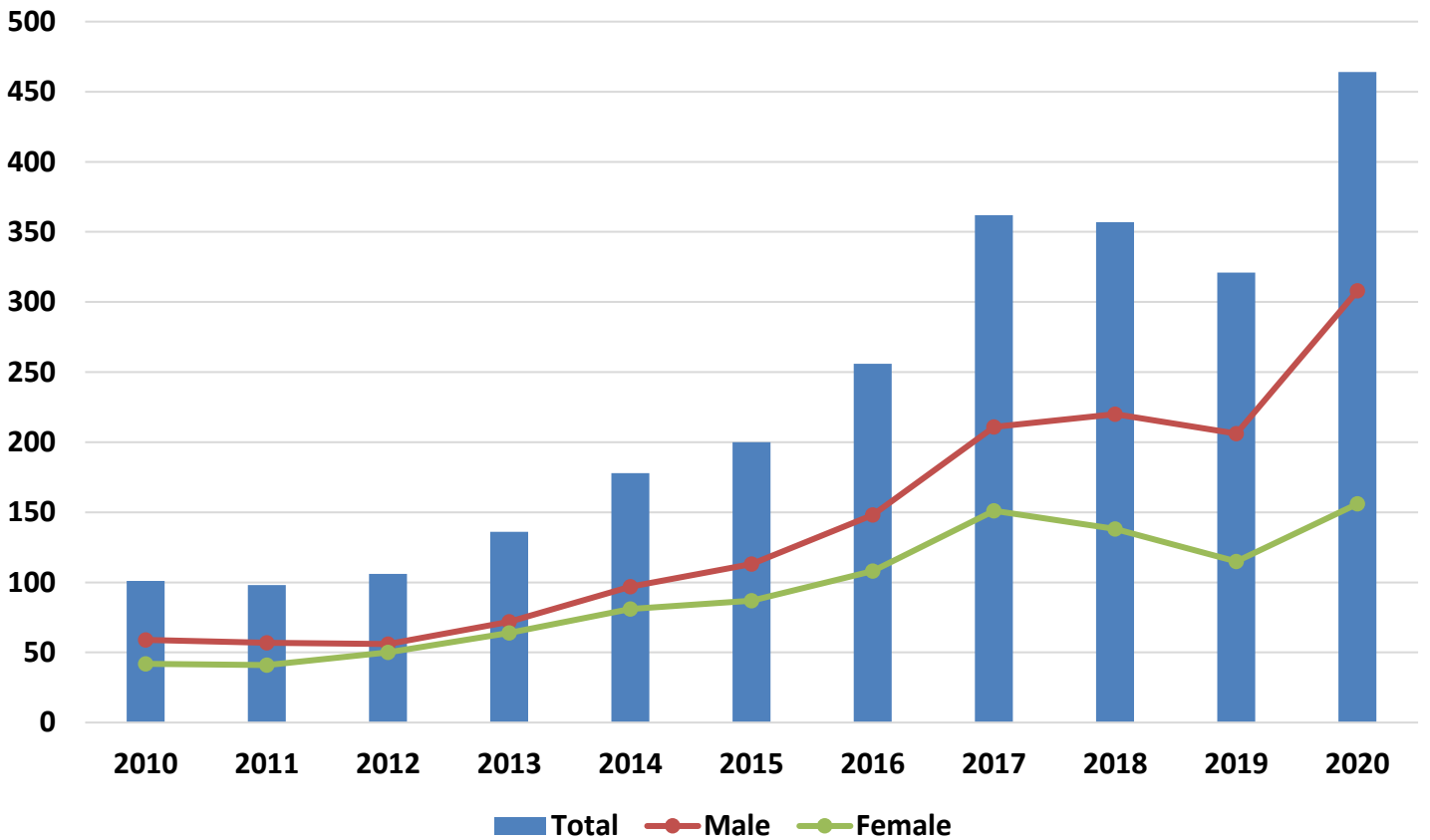
■ Infants ■ 1 to 4 ■ 5 to 14 ■ 15 to 24 ■ 25 to 34 ■ 35 to 44 ■ 45 to 54 ■ 55 to 64 ■ 65 to 74 ■ 75+

### Anderson County 2020 Drug-Related Deaths by Age Distribution

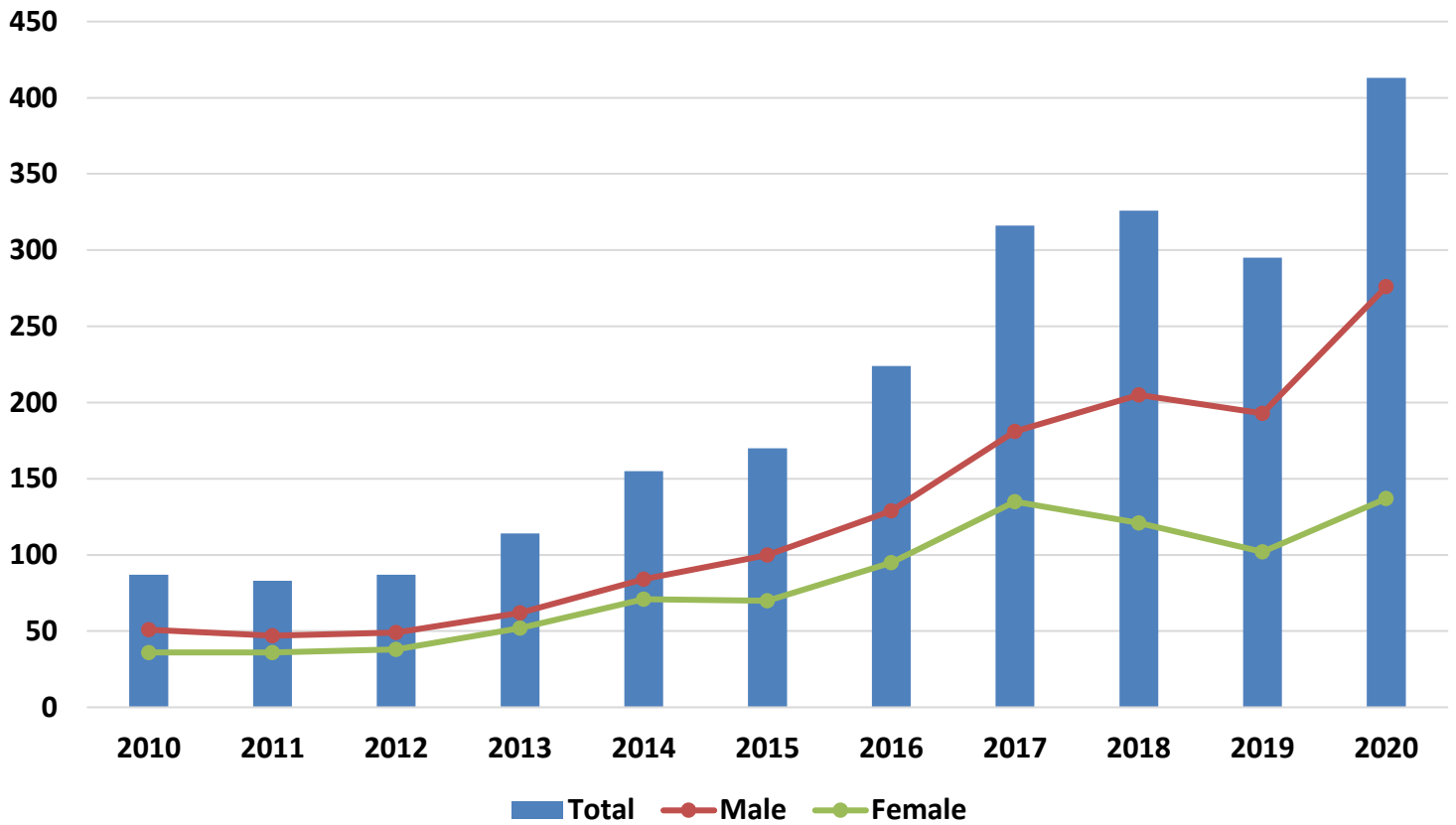


■ Infants ■ 1 to 4 ■ 5 to 14 ■ 15 to 24 ■ 25 to 34 ■ 35 to 44 ■ 45 to 54 ■ 55 to 64 ■ 65 to 74 ■ 75+

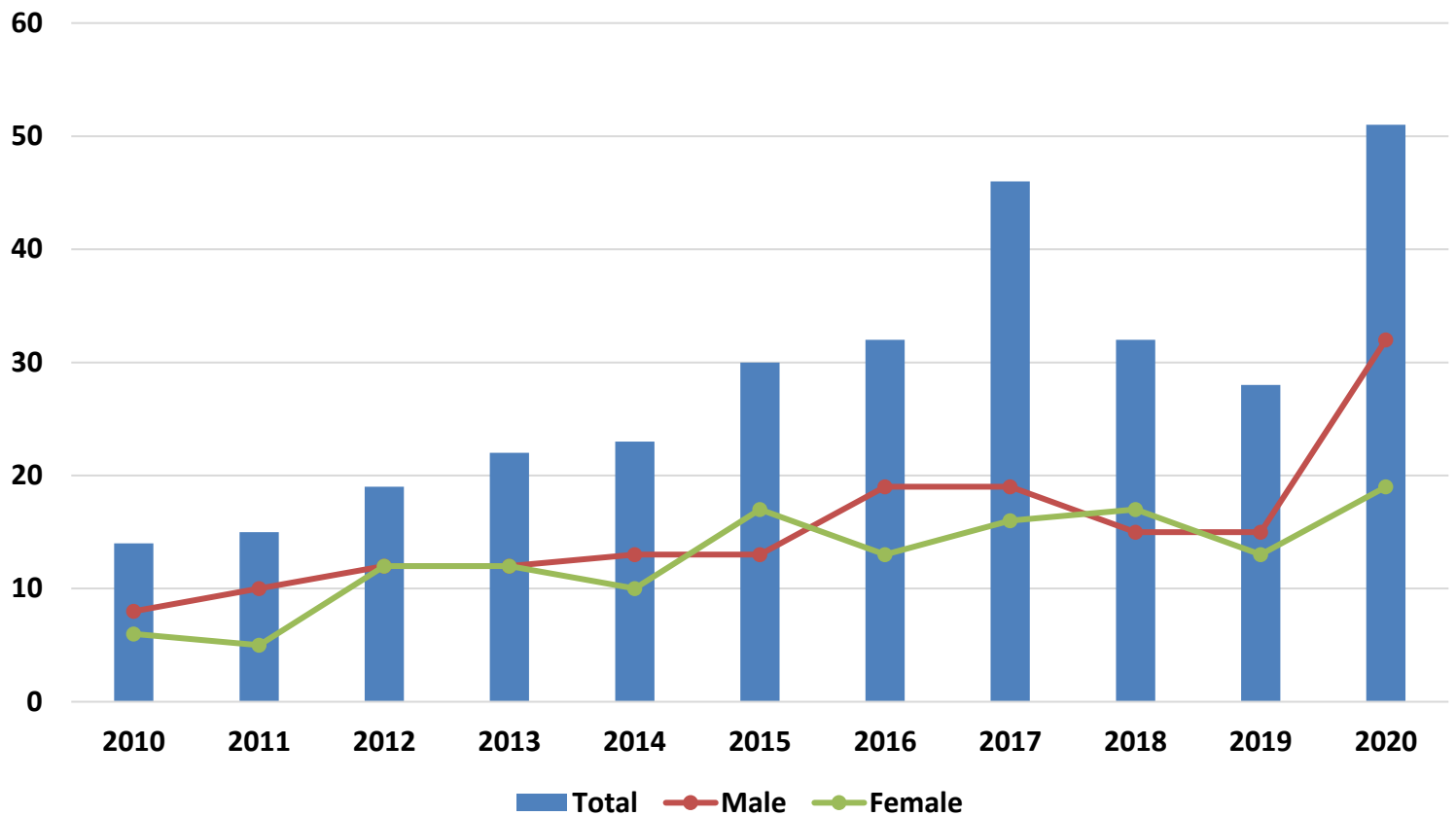
## Knox and Anderson Counties Drug-Related Death Distribution by Gender 2010-2020



## Knox County Drug-Related Death Distribution by Gender 2010-2020

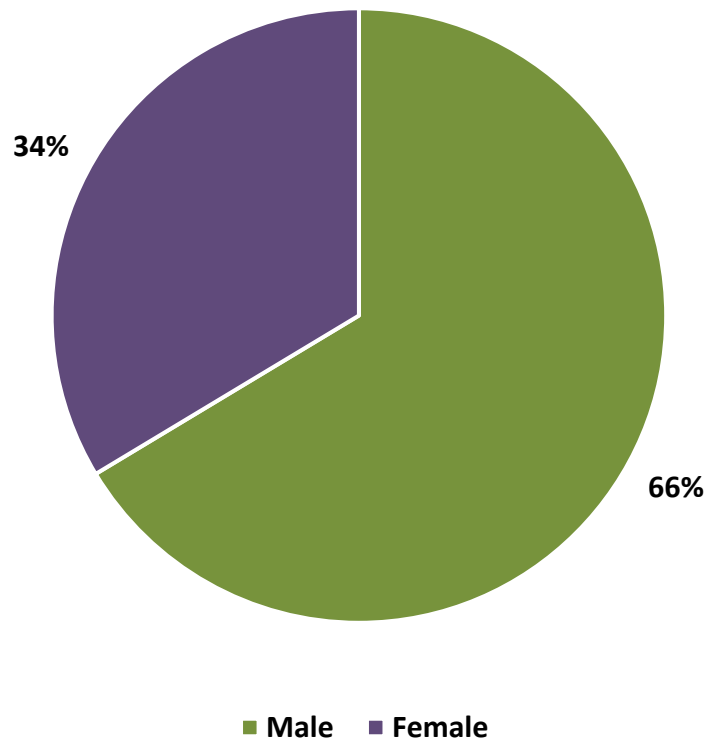


### Anderson County Drug-Related Death Distribution by Gender 2010-2020

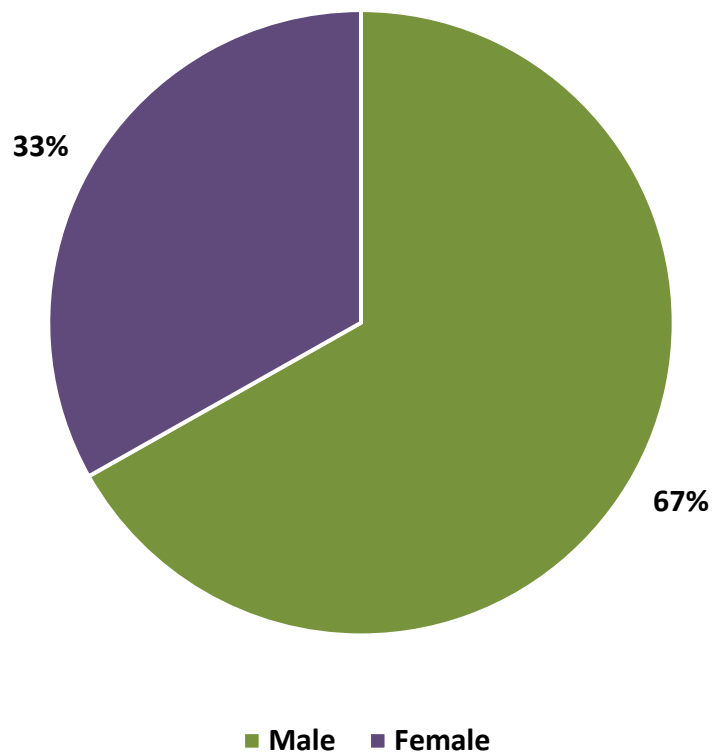




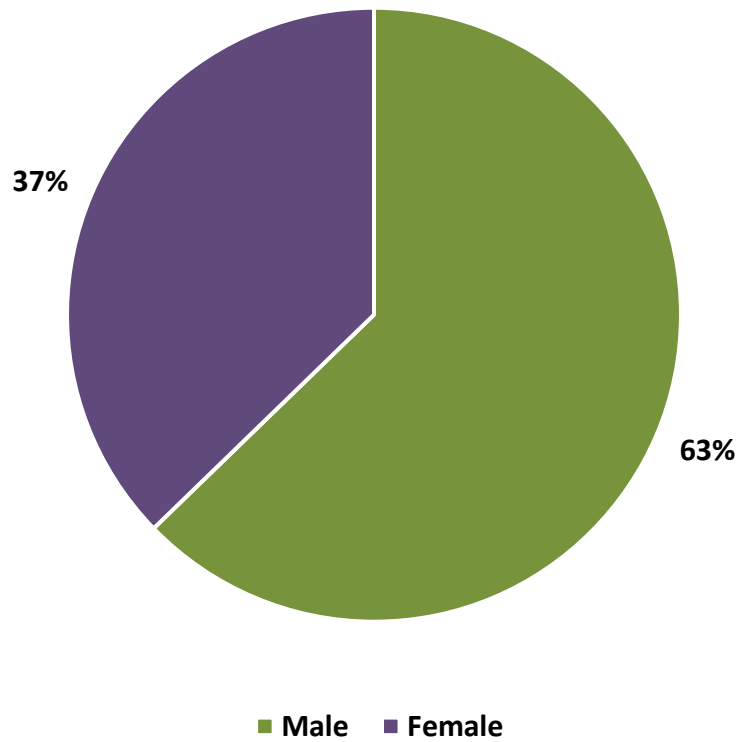
**Knox and Anderson Counties  
2020 Drug-Related Death  
Distribution By Gender**



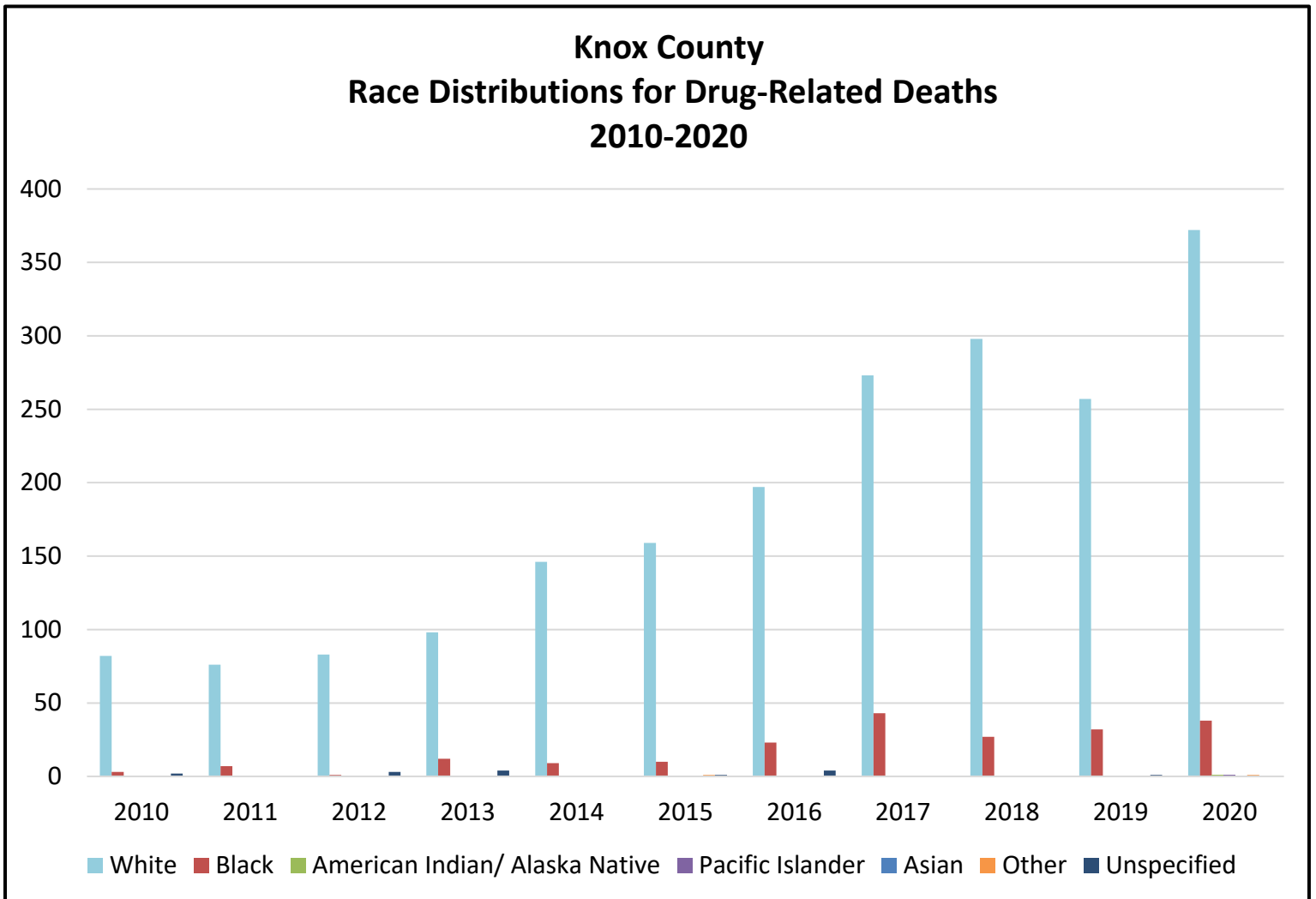
**Knox County  
2020 Drug-Related Death  
Distribution By Gender**



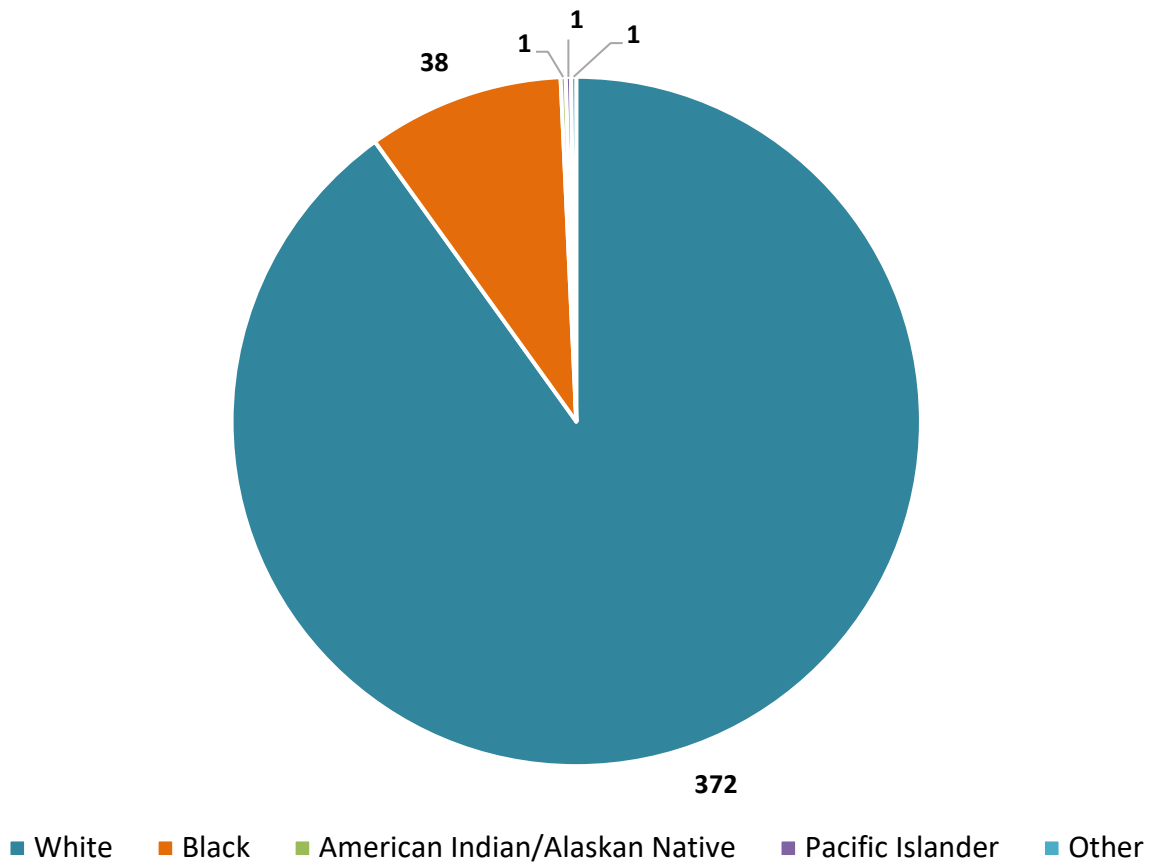
**Anderson County  
2020 Drug-Related Death  
Distribution by Gender**



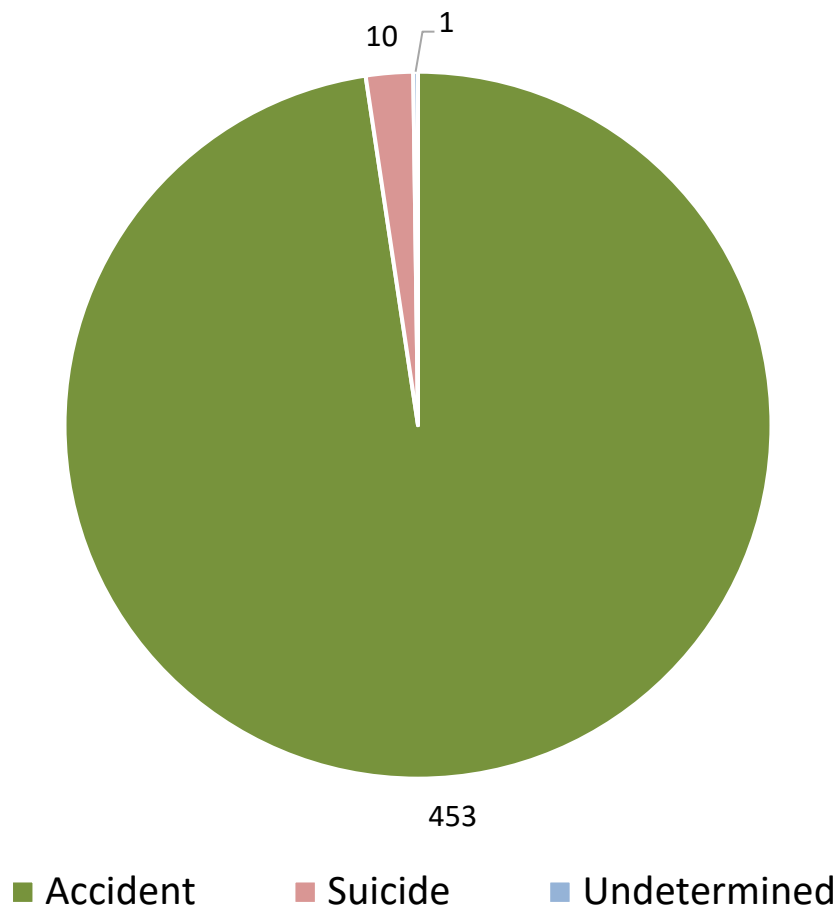
## Knox County Race Distributions for Drug-Related Deaths 2010-2020



**Knox County  
2020 Drug-Related Death  
Distribution by Race**

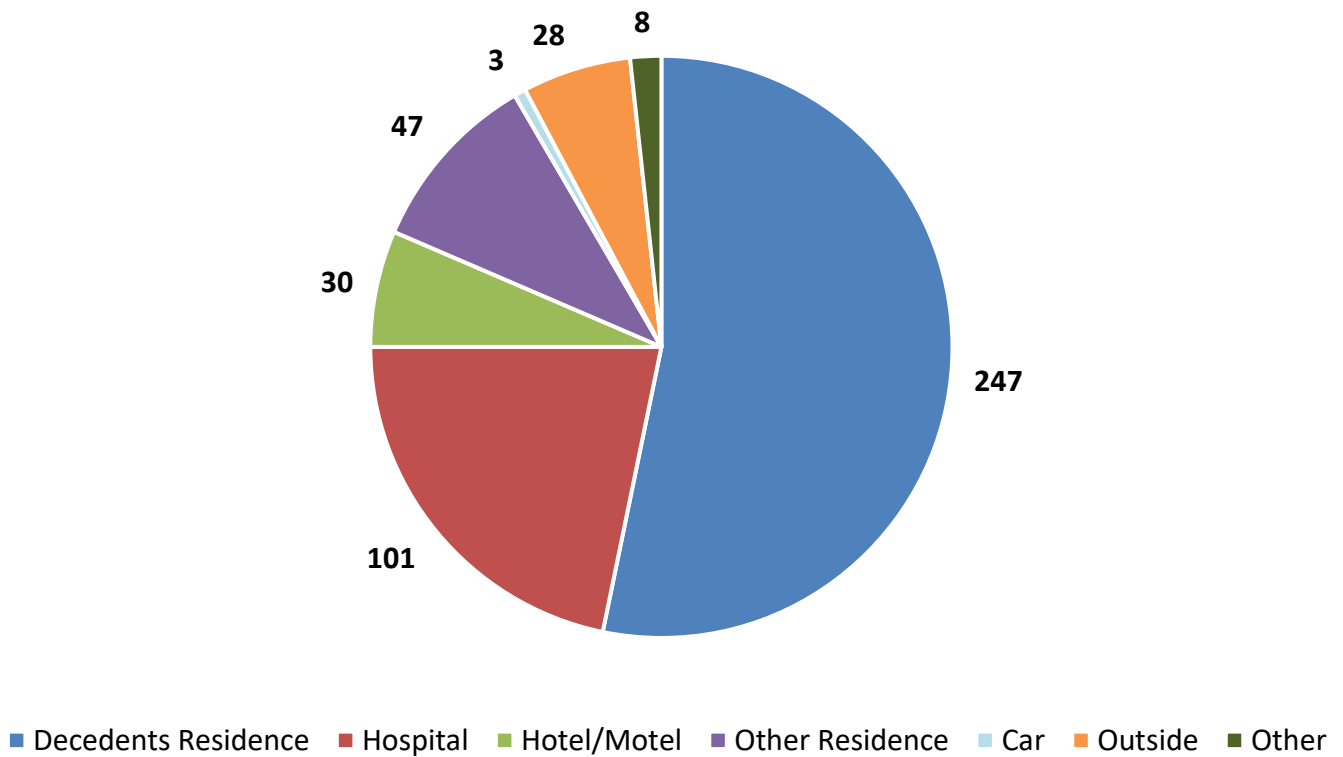


**Knox and Anderson Counties  
2020 Drug-Related Deaths  
by Manner of Death**





**Knox and Anderson County  
Location Types  
Where 2020 Drug-Related Deaths Occurred**



# 2020 Drug-Related Death Report

## Zip Code Distribution and Heat Maps by Year and County

The following zip code data represents home addresses, location of injury, and death locations for drug-related deaths that had an autopsy or examination in 2020 for Knox and Anderson Counties at the Knox County Regional Forensic Center. The data source and notes are listed here for the zip code related pages.

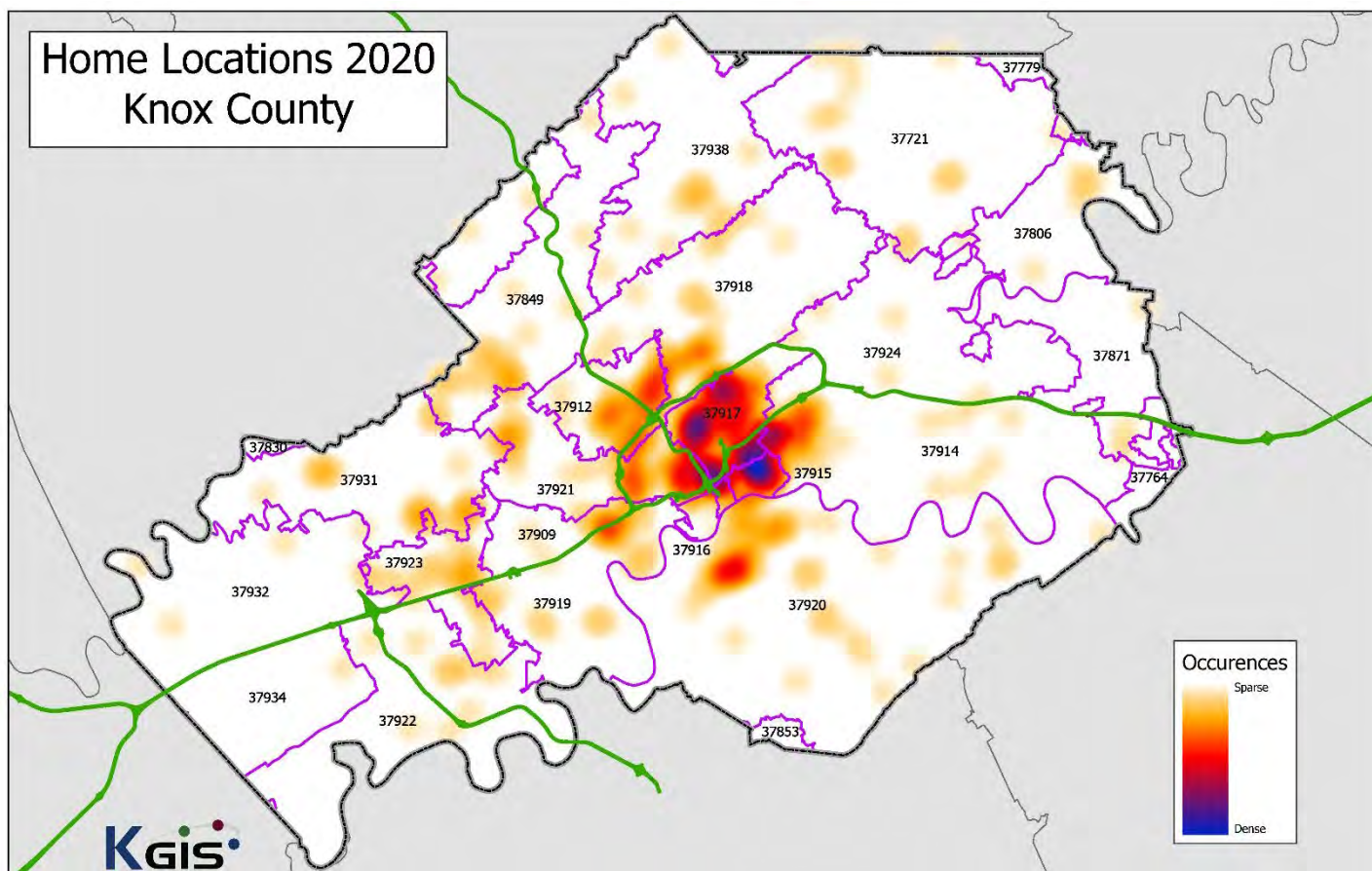
KGIS assisted by creating heat maps. The heat maps represent drug-related deaths based on home address, location of injury, and location of death.

### DATA SOURCE:

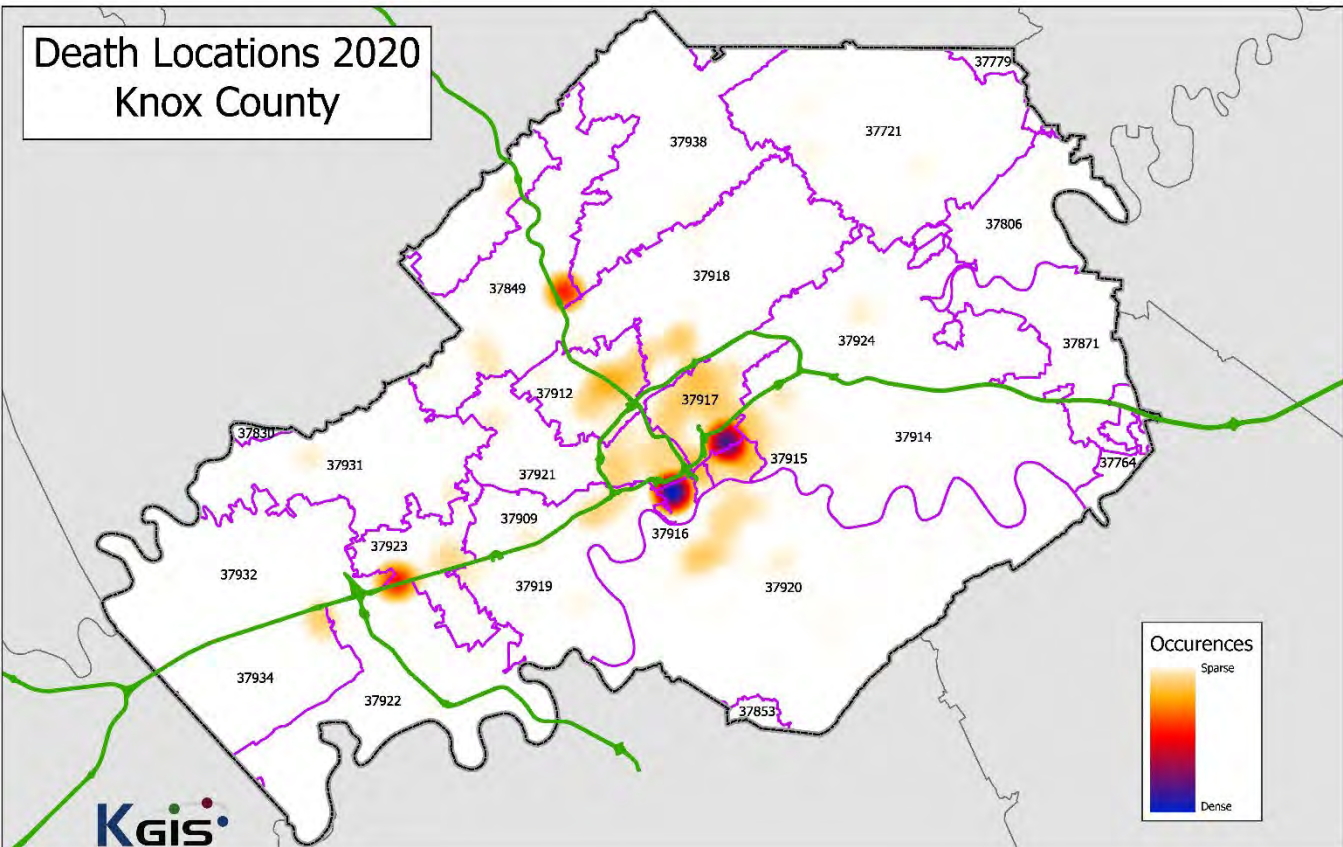
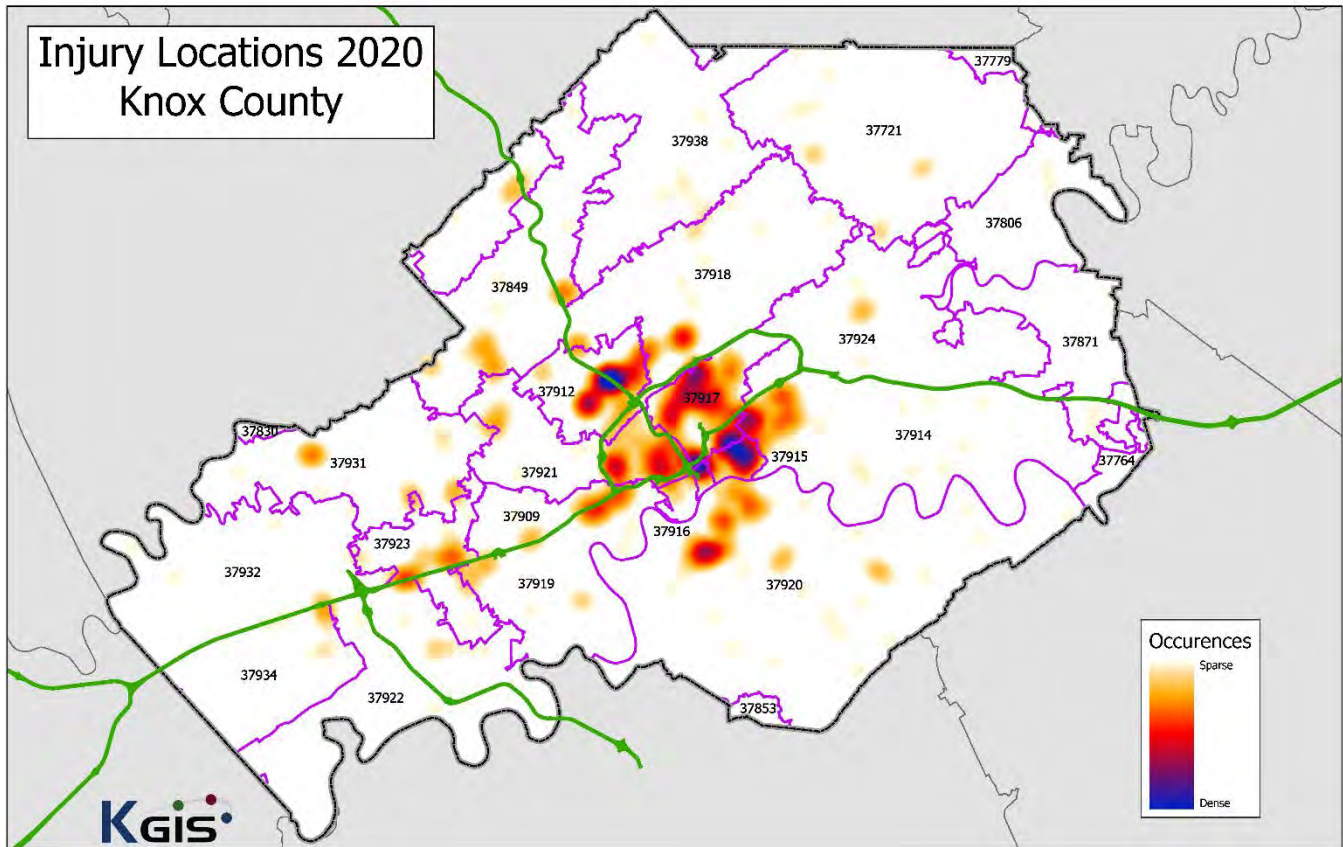
2020 Maps: MDILog Database and Knox County RFC Medical Examiner Database, 2020. Knoxville, TN.

### NOTES:

1. The Home Address Location maps represent where the people who died of a Drug-Related death resided.
2. The Location of Injury Address maps represent where Drug-Related injury occurred.
3. The Death Location maps represent where the people died from the Drug-Related death. Hospital locations were added to the maps for reference.

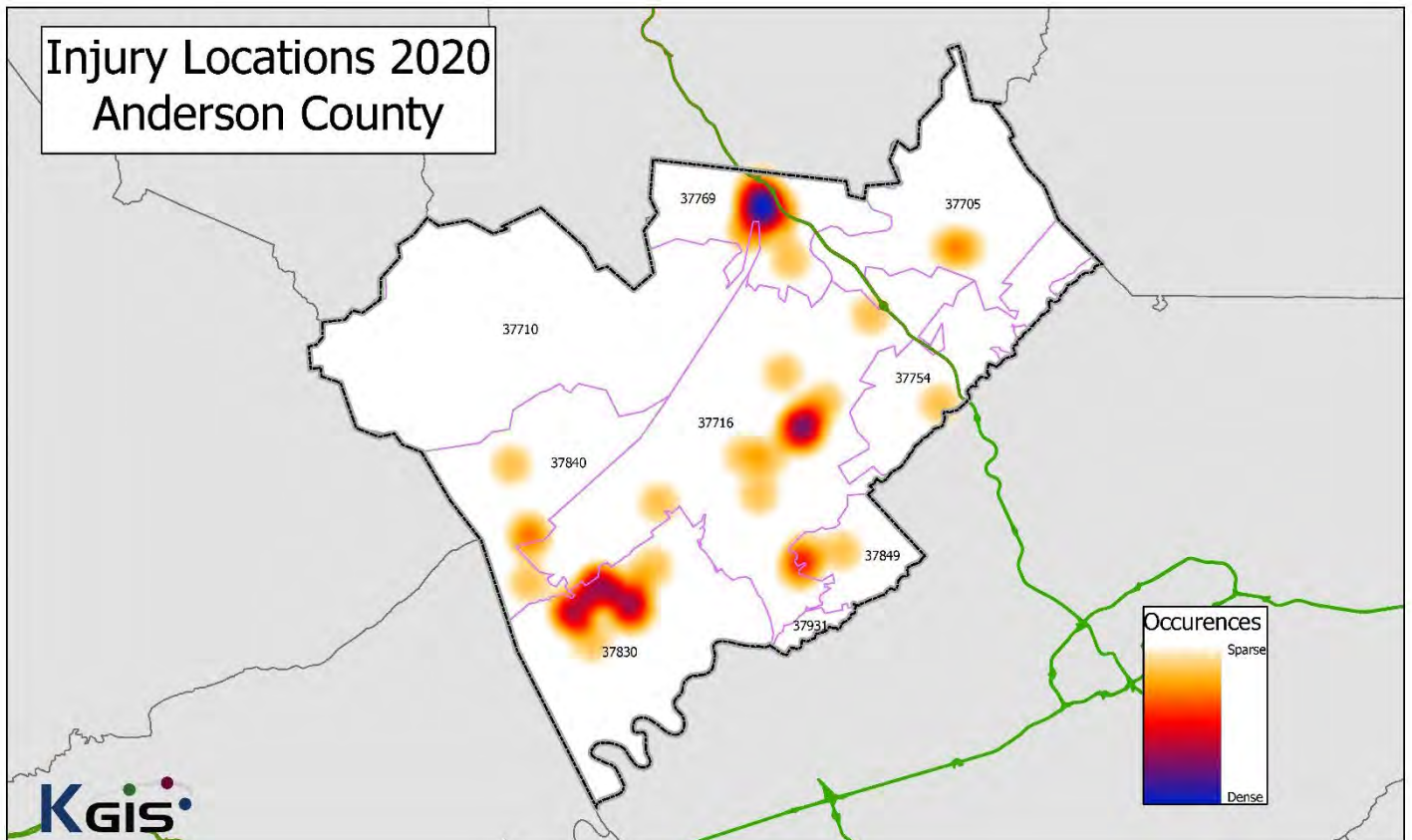
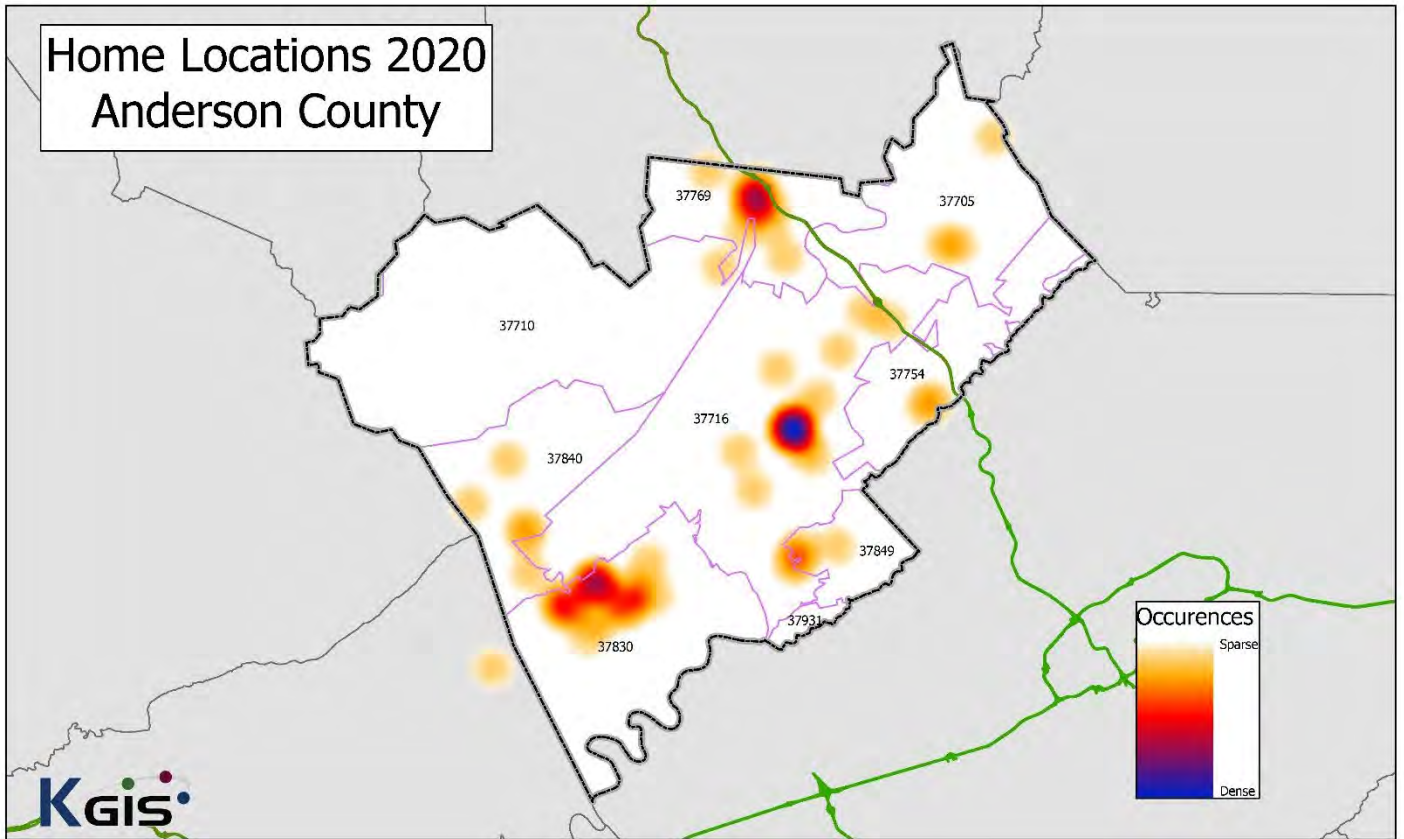


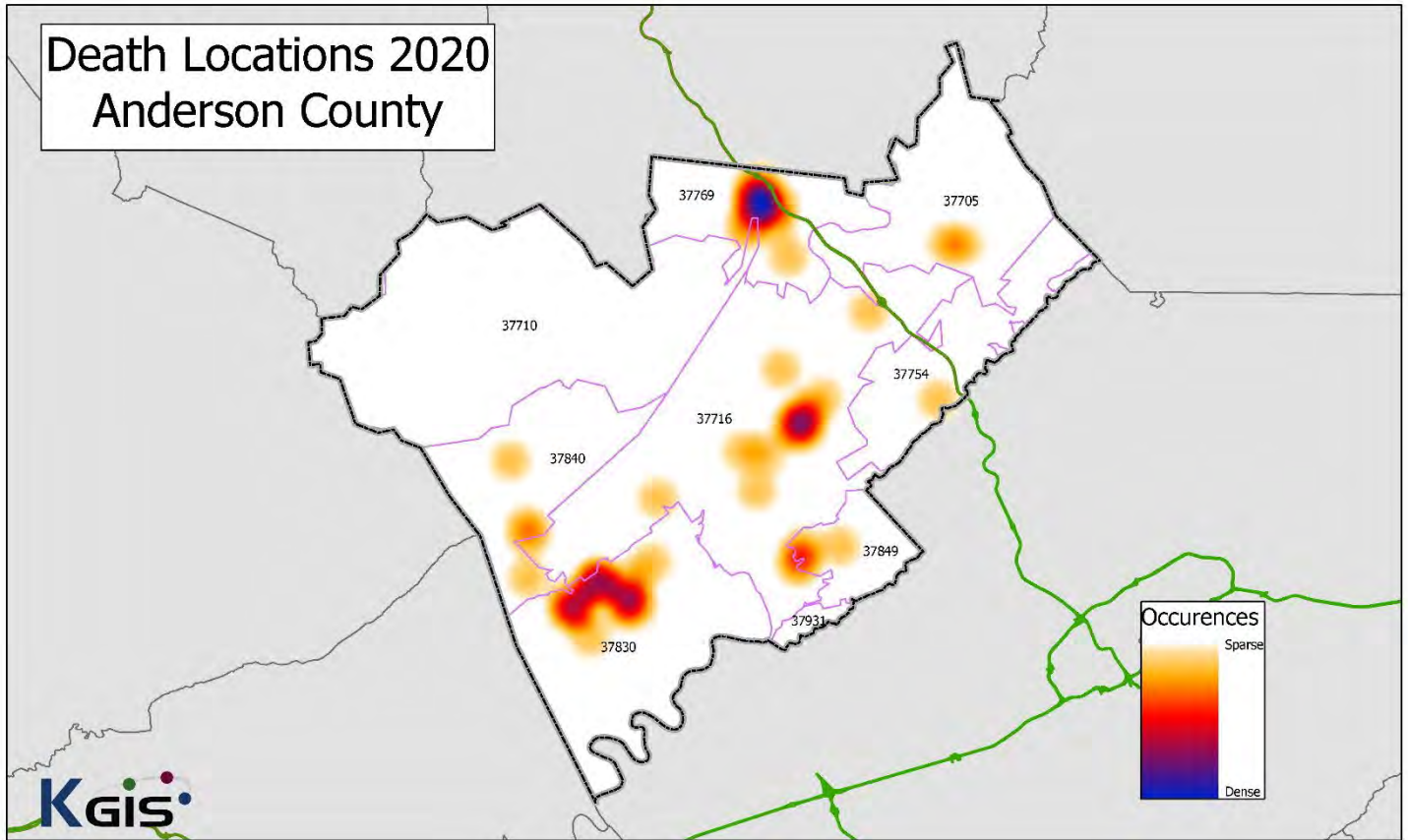
# 2020 Drug-Related Death Report





# 2020 Drug-Related Death Report





# 2020 Drug-Related Death Report

## Knox and Anderson Counties Top 10 Drugs Found in Drug-Related Deaths by Year 2015-2020

	2015	2016	2017	2018	2019	2020
1	Oxycodone	Fentanyl & Analogues	Fentanyl & Analogues	Fentanyl & Analogues	Fentanyl & Analogues*	Fentanyl & Analogues*
2	Oxymorphone	Oxymorphone	Cocaine	Methamphetamine	Methamphetamine	Methamphetamine
3	Alprazolam	Oxycodone	Methamphetamine	Heroin	Alcohol/Ethanol	Heroin
4	Cocaine	Alprazolam	Heroin	Cocaine	Heroin	Alcohol/Ethanol
5	Heroin	Methamphetamine	Oxymorphone	Alcohol/Ethanol	Cocaine	Cocaine
6	Morphine	Cocaine	Alprazolam	Alprazolam	Oxymorphone	Gabapentin
7	Fentanyl	Hydrocodone	Oxycodone	Oxycodone	Alprazolam	Diphenhydramine
8	Hydrocodone	Morphine	Alcohol/Ethanol	Oxymorphone	Oxycodone	Oxycodone
9	Alcohol/Ethanol	Alcohol/Ethanol	Morphine	Morphine	Gabapentin	Alprazolam
10	Methadone	Heroin	Hydrocodone	Methadone	Diphenhydramine	Oxymorphone

\*Includes fentanyl, Acetyl Fentanyl, Methoxyacetyl fentanyl, para-Fluorofentanyl, Valeryl Fentanyl, Acryl Fentanyl, 2-Furanylfentanyl, and Isobutyrylfentanyl

Data Source: Knox County RFC Medical Examiner Database 2015-2016 and MDILog Database 2016-2020 Knoxville, TN

Note:

1. This report notes only the presence of the drugs contributing to death but does not indicate the appropriate or legal use of a drug.
2. Drug poisoning deaths may involve more than one specific substance.
3. Some drugs are listed as Not Otherwise Specified (NOS) because information was obtained from sources that did not define the drug type.





## Knox County Regional Forensic Center Frequency of Drugs Found in Drug-Related Deaths in 2020

Drug	Total Cases (N=464)		
	Knox (N=413)	Anderson (N=51)	Total
<b>Fentanyl and Analogues</b>	406	38	444
Fentanyl	279	29	308
Acetyl Fentanyl	78	9	87
Methoxyacetyl fentanyl	35	4	39
para-Fluorofentanyl	6	0	6
Valeryl Fentanyl	1	0	1
Acryl Fentanyl	1	0	1
2-Furanylfentanyl	1	0	1
Isobutyrylfentanyl	1	0	1
Methamphetamine	141	23	164
Heroin	86	14	100
Alcohol/Ethanol	92	0	92
Cocaine	68	2	70
Gabapentin	54	15	69
Diphenhydramine	57	7	64
Oxycodone	27	4	31
Alprazolam	21	7	28
Oxymorphone	23	4	27
Tramadol	21	1	22
Metonitazene	21	1	22
Flunitrazolam	15	4	19
Methadone	15	0	15
Hydrocodone	11	3	14
Buprenorphine	12	0	12
Diazepam	11	0	11

# 2020 Drug-Related Death Report

2020 DRD Cases with Naloxone Use and Drug Type				
	Naloxone-Rx Drug Only	Naloxone-Illicit Drug Only	Naloxone-Rx and Illicit Drug	Total
<b>Knox</b>	5	56	36	<b>97</b>
<b>Anderson</b>	0	7	5	<b>12</b>
<b>Total</b>	<b>5</b>	<b>63</b>	<b>42</b>	<b>109</b>

This report is also available online at

<http://www.knoxcounty.org/rfc/reports.php>.

\*Acknowledgements to Anna Hoekstra at RFC and Sean Kitts at KGIS

