KNOX COUNTY
REGIONAL FORENSIC CENTER

2018

DRUG RELATED DEATH STATISTICS

Knox and Anderson County, Tennessee

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from the desk of the

Chief Medical Examiner

The Tale of Two Counties

Three years ago, the Regional Forensic Center (RFC) introduced the Yearly Drug-Related Death Report to identify the main forces behind the trend of drug dependency, addiction and substance abuse in Knox and Anderson counties.

In Knox County, the overdose death trend has slowed significantly. In 2018, the overdose mortality increased just 3.2% over the previous year; much less than the 41% from 2016 to 2017. While overdose deaths are starting to plateau or decline in many other regions, Knox County has maintained an upward trajectory, even though it is a slow rise. However, prescription opiates and opioids alone, or in combination with other prescribed or diverted medications, ceased to be the number one culprit for overdose deaths.

In Anderson County, drug overdose deaths dropped about 30% and the type of drugs abused and the frequency of their involvement in causing death has significantly dropped. Prescription opioids do remain the number one culprit, which illustrates that more rural areas are still victimized by either improper prescribing or drug diversion, sometimes both.

As the RFC continues to monitor drug overdose trends and the introduction of novel and emerging substances, it has become apparent that the "speedball" combination of methamphetamine and fentanyl, with or without analogue and/or heroin, is a rising drug of choice. Methamphetamine has been around for a long time, but today's version is not the same substance as in the past. The methamphetamine flooding the local markets today is more refined and much stronger and is produced and imported from foreign, mostly overseas, labs. Frequently, this substance is found either alone or in "speedball" combinations in many individuals who die from other causes. In those instances, it is likely the drug(s) played an important role in the terminal event, be it motor vehicle accidents, falls, ballistic injuries or suicides of all methods.

Through medico-legal death investigations, the RFC has encountered several instances in which three generations of one family are decimated by either drugs or alcohol. As such, and through the hard work of the Metro Drug Coalition (MDC), there has been an increase in discussion surrounding Adverse Childhood Events (ACEs). This work shows that the association and correlation between ACEs and drug abuse, psychiatric illness, pain syndromes and rising suicide rates, are indisputable.

It is also important to note that synthetic opioids, including more potent and evolving fentanyl analogues, have become more powerful and deadly with each new released derivative. These powerful drugs, produced in clandestine labs under questionable circumstances and unsanitary conditions, are finding their ways into our community. The demand for these drugs has led to a steady increase in crime as property crimes and other types of offenses and felonies are inexorably linked to addiction. Additionally, the spread of communicable diseases increases since the frequent progression to intravenous narcotism and propensity to make other questionable and unhealthy lifestyle choices grow. The societal price of morbidity and mortality in the wake of drug abuse destruction is staggering.

, MD, PhD

Darinka Mileusnic-Polchan, MD, PhD

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2018 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 (1). In 2018, 325 people died from drug overdose in Knox County and 32 people died in Anderson County. While this is still an upward trend in drug-related deaths from 2017, the increase in drug-related deaths is not nearly as sharp as that between 2016 and 2017. Preliminary data for drug-deaths in 2019 also indicate a continued 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.).

2018 Report Highlights for Knox and Anderson Counties:

- Knox County has a 3.2% *increase* in drug-related deaths from 2017 to 2018.
- Anderson County has a 30.4% *decrease* in drug-related deaths from 2017 to 2018.
- Fentanyl and fentanyl analogues (synthetic opioids) are the most frequently identified drugs in drug-related deaths in 2018.
- Polypharmacy (more than one drug responsible for death) was involved in 72% of Knox County and 47% of Anderson County overdose deaths.
- The five most common drugs identified in drug-related deaths in 2018 are synthetic opioids, methamphetamine, heroin, cocaine, and alcohol.
- Prescription opioid related deaths continue to decrease in our jurisdictions.
- The 45-54 year age group has the most drug deaths in Knox County, although the sharpest decrease was in 15-24 year age group and the sharpest increase was in 25-34 in 2018.

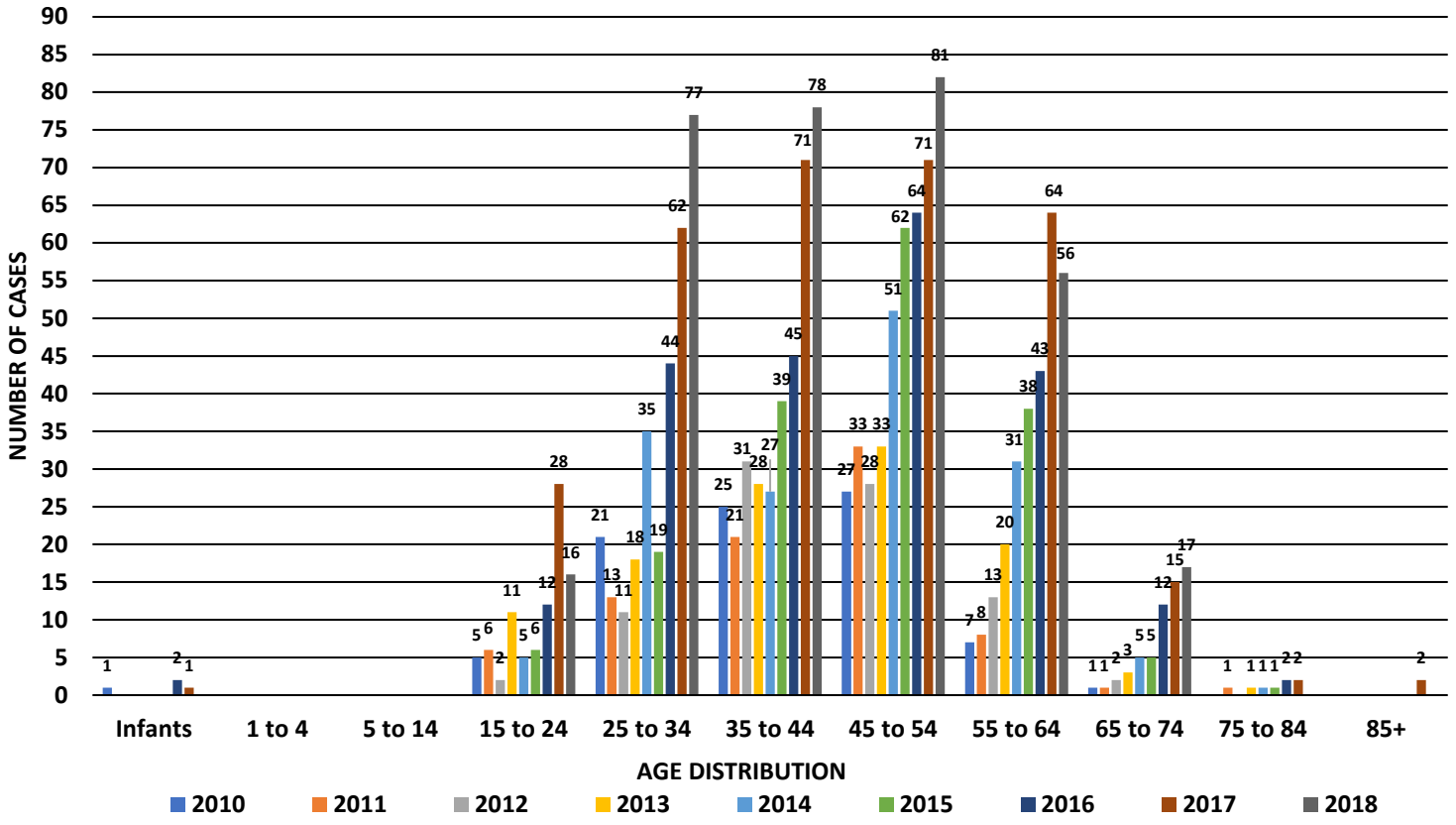
Data and Methods

- 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 January 1, 2018 through December 31, 2018. The initial query included non-motor vehicle accidents, undetermined, and suicide manners of death. The initial data set was examined to ensure that all cases included 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. Data Pull and initial statistical calculations by Mr. John Lott, RN, MS

REFERENCES:

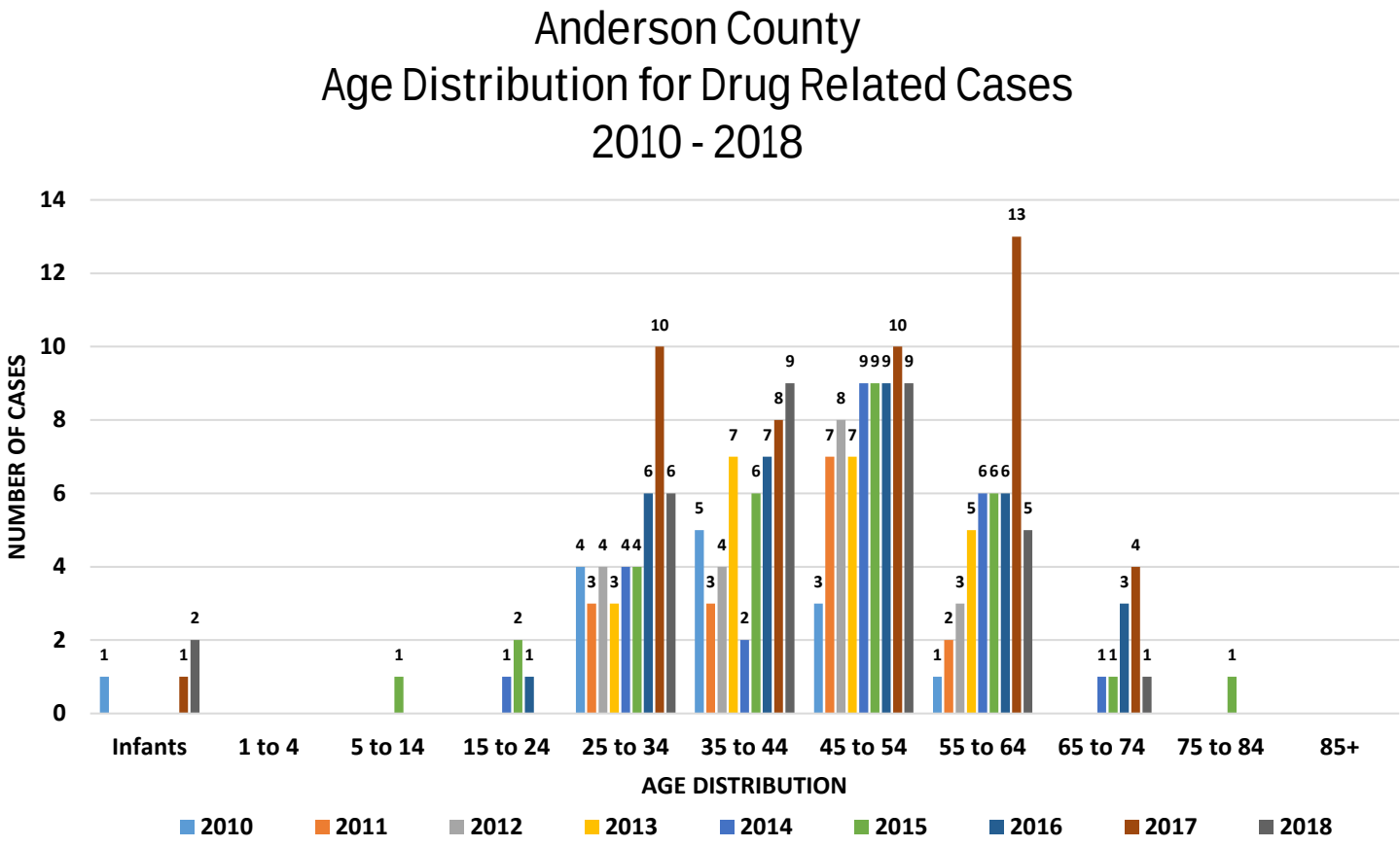
NIHCM 2019 https://www.nihcm.org/categories/the-evolution-of-the-opioid-crisis-2000-2017

2018 Drug Related Death Statistics



Data Source: Knox County RFC Medical Examiner Database, 2010 to 2016 and MDILog Database 2016 - 2018. Knoxville, TN.

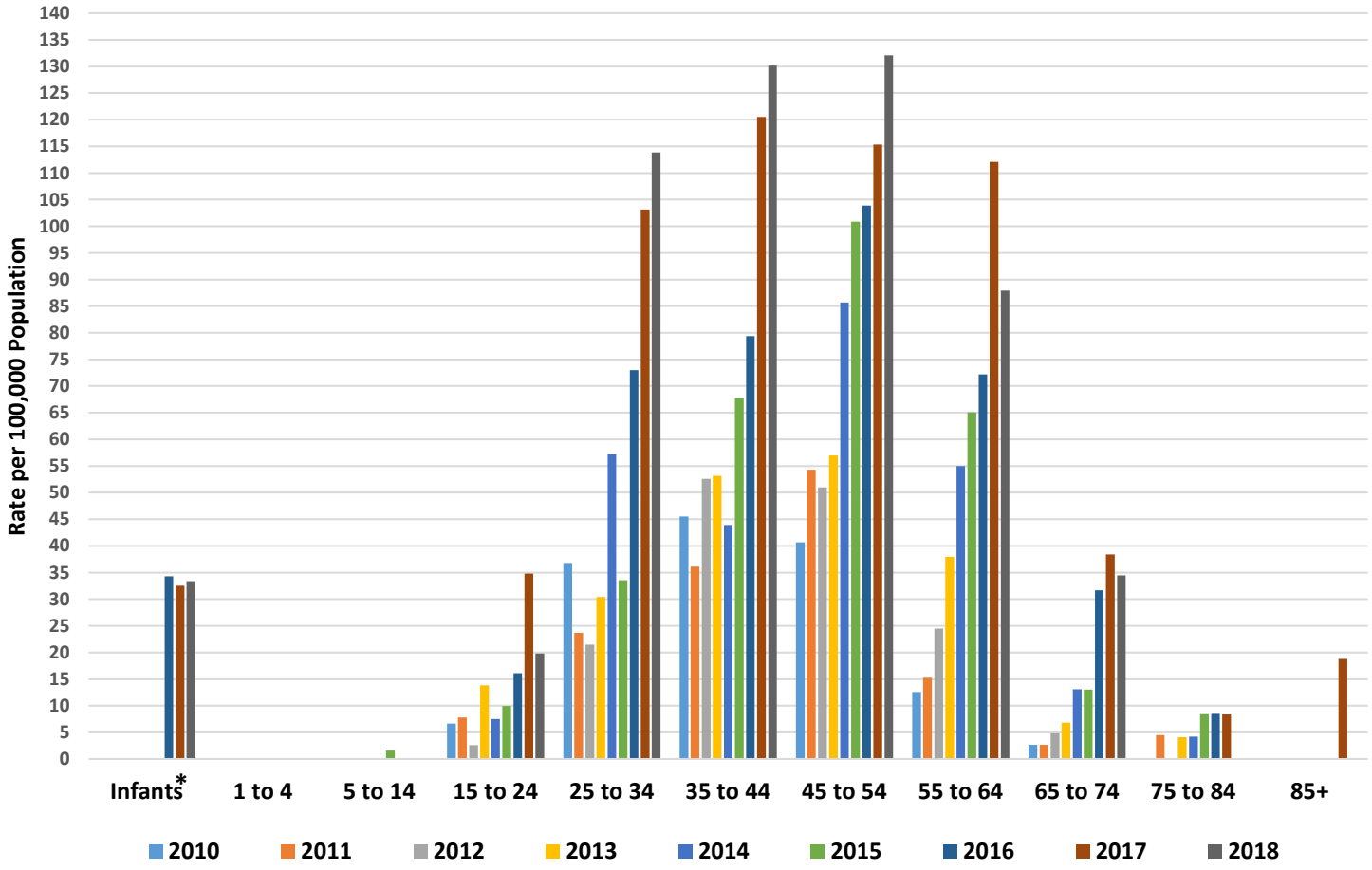
2018 Drug Related Death Statistics



Data Source: Knox County RFC Medical Examiner Database, 2010 to 2016 and MDILog Database 2016 - 2018. Knoxville, TN.

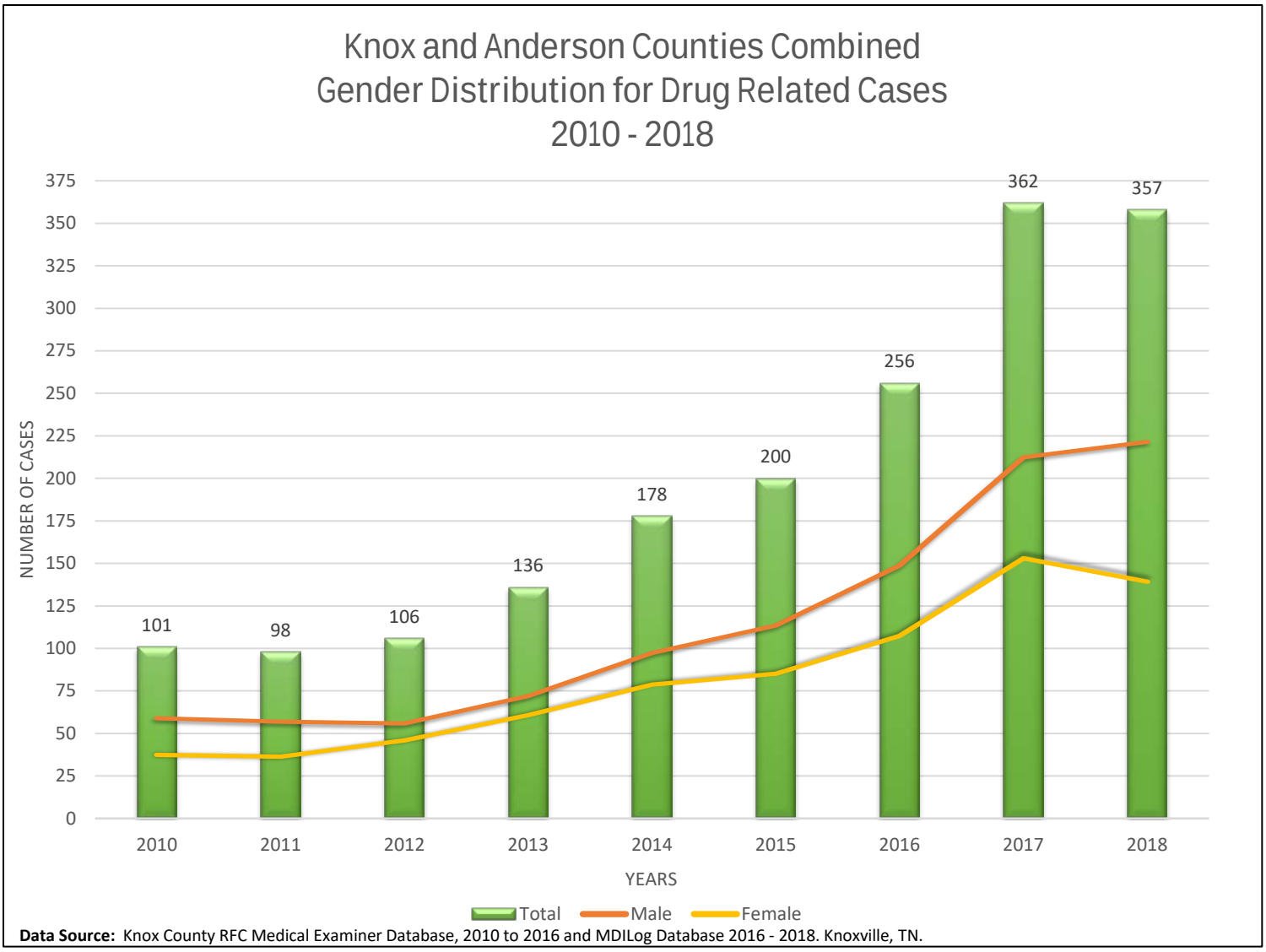
2018 Drug Related Death Statistics

Knox and Anderson Counties Combined
Age Adjusted Rate per 100,000 for Drug Related Cases
2010 - 2018



Data Source: Knox County RFC Medical Examiner Database, 2010 to 2016 and MDILog Database 2016 - 2018. Knoxville, TN.
Population Data Source: 2018 population data estimates from American Fact Finder, U.S. Census
* While infant numbers appear high, remember this is an age adjusted rate per 100,000 and the infant group is only a one year span compared to multi-year age categories.

2018 Drug Related Death Statistics



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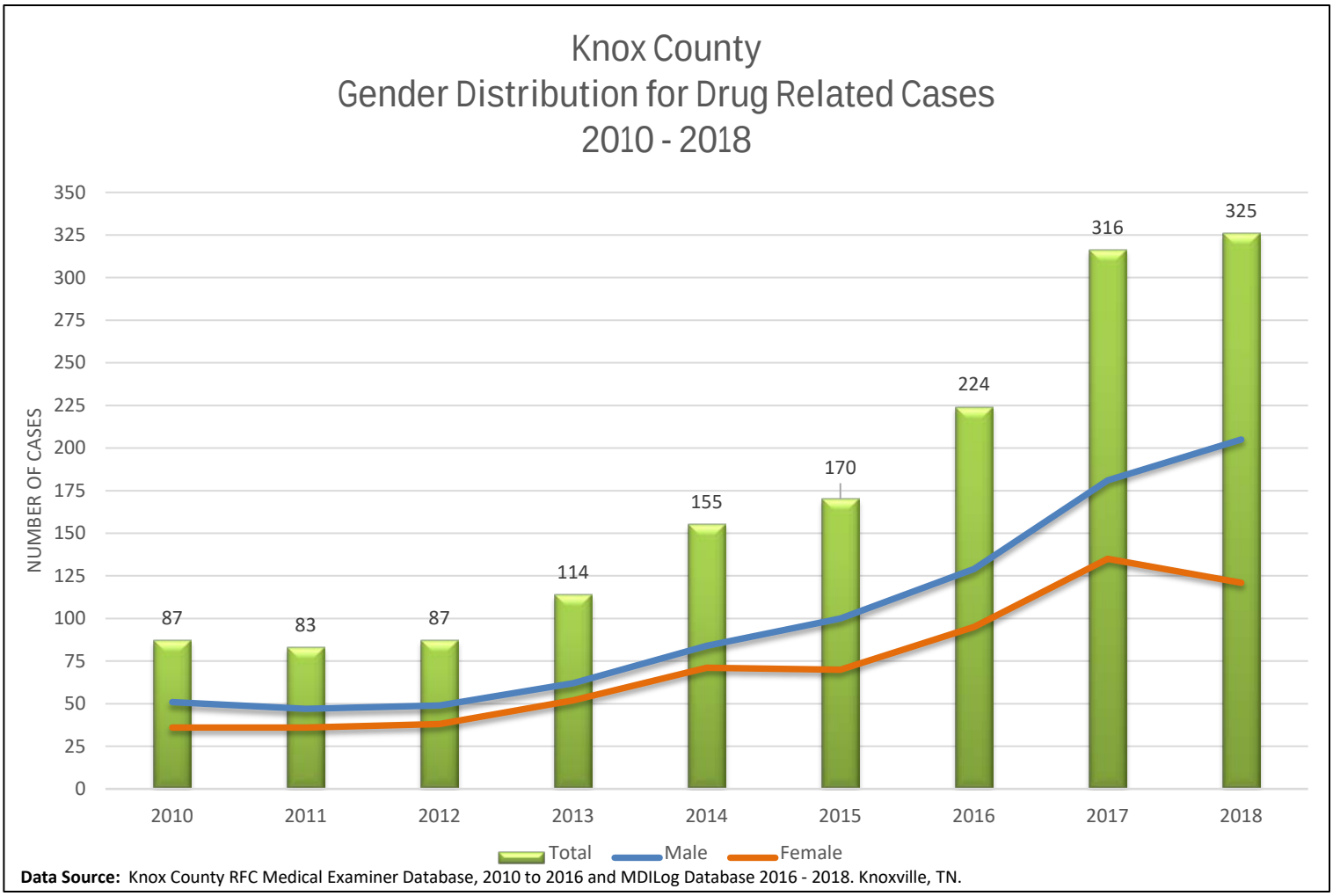

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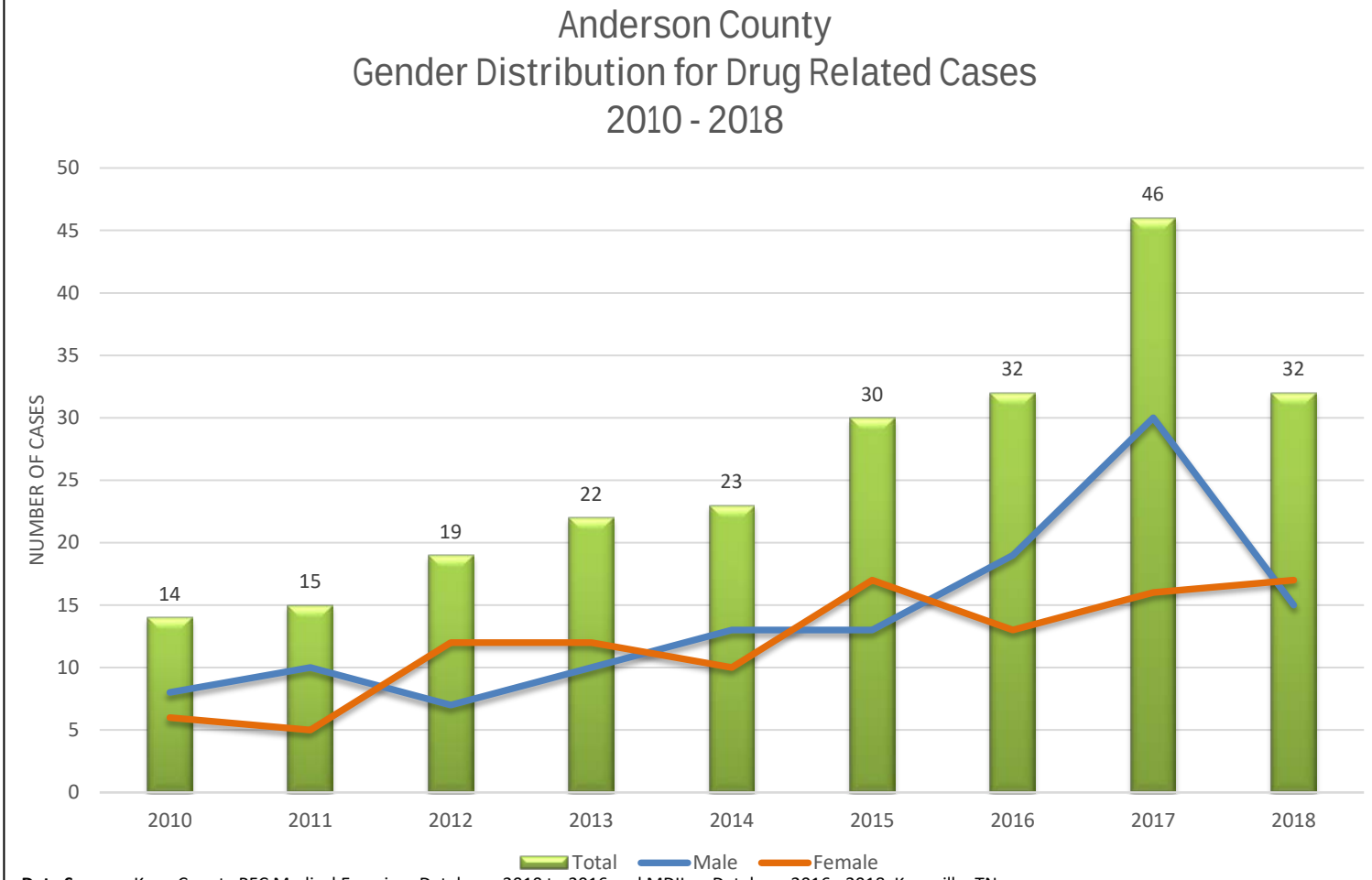

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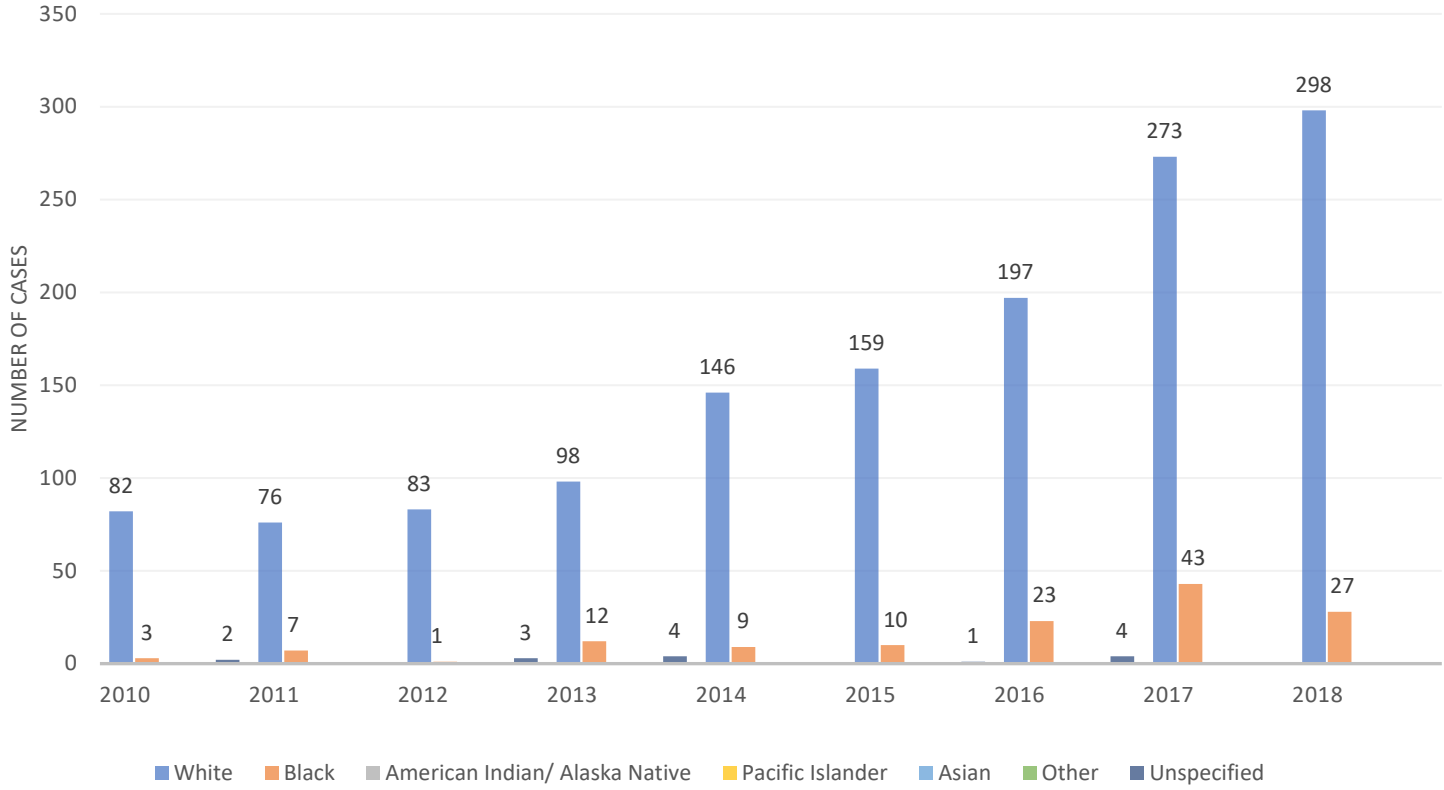


Data Source: Knox County RFC Medical Examiner Database, 2010 to 2016 and MDILog Database 2016 - 2018. Knoxville, TN.

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 which had an autopsy or examination in 2018 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.

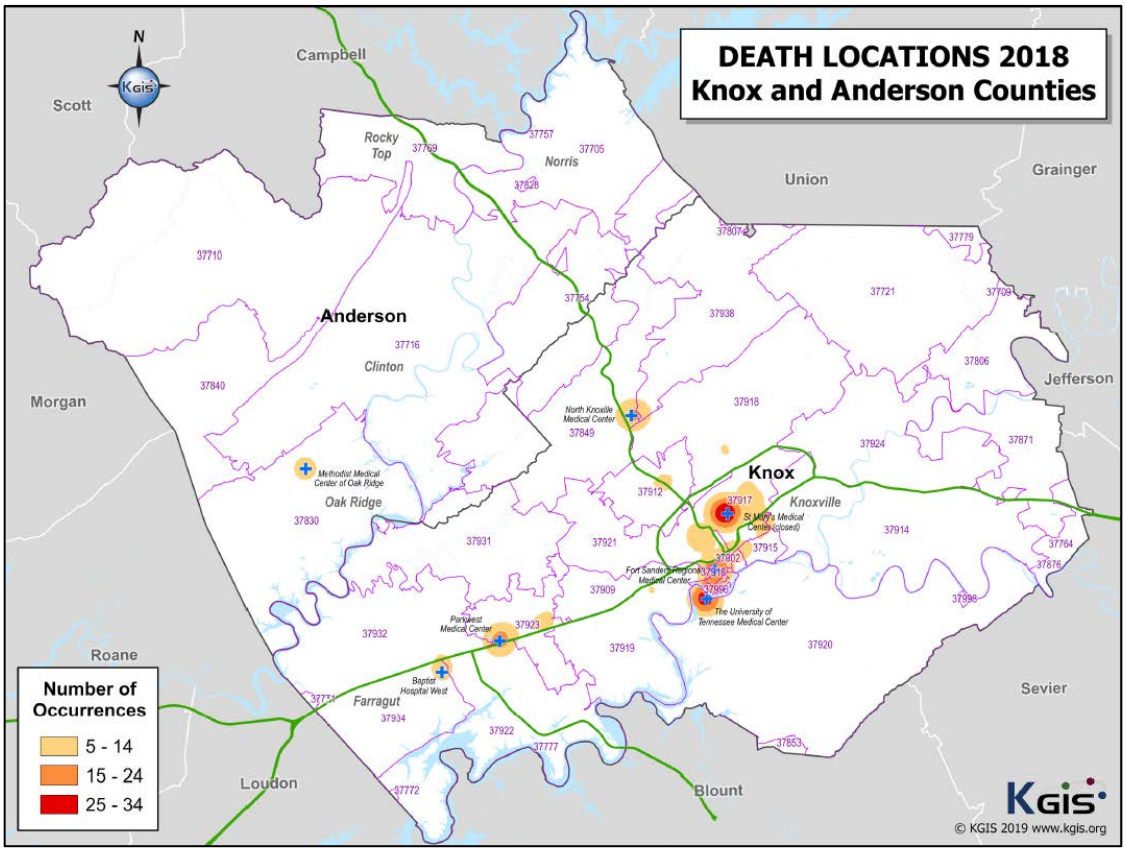
KGIS assisted by creating Heat maps. The Heat maps represent Drug Related Deaths based on Home Address, Location of Injury, or Location of Death.

DATA SOURCE:

1. 2018 Maps: MDILog Database and Knox County RFC Medical Examiner Database, 2018. Knoxville, TN.
2. 2010 – 2018 Maps: Knox County RFC Medical Examiner Database, 2010 to 2016 and MDILog
3. Database 2016 - 2018. Knoxville, TN.

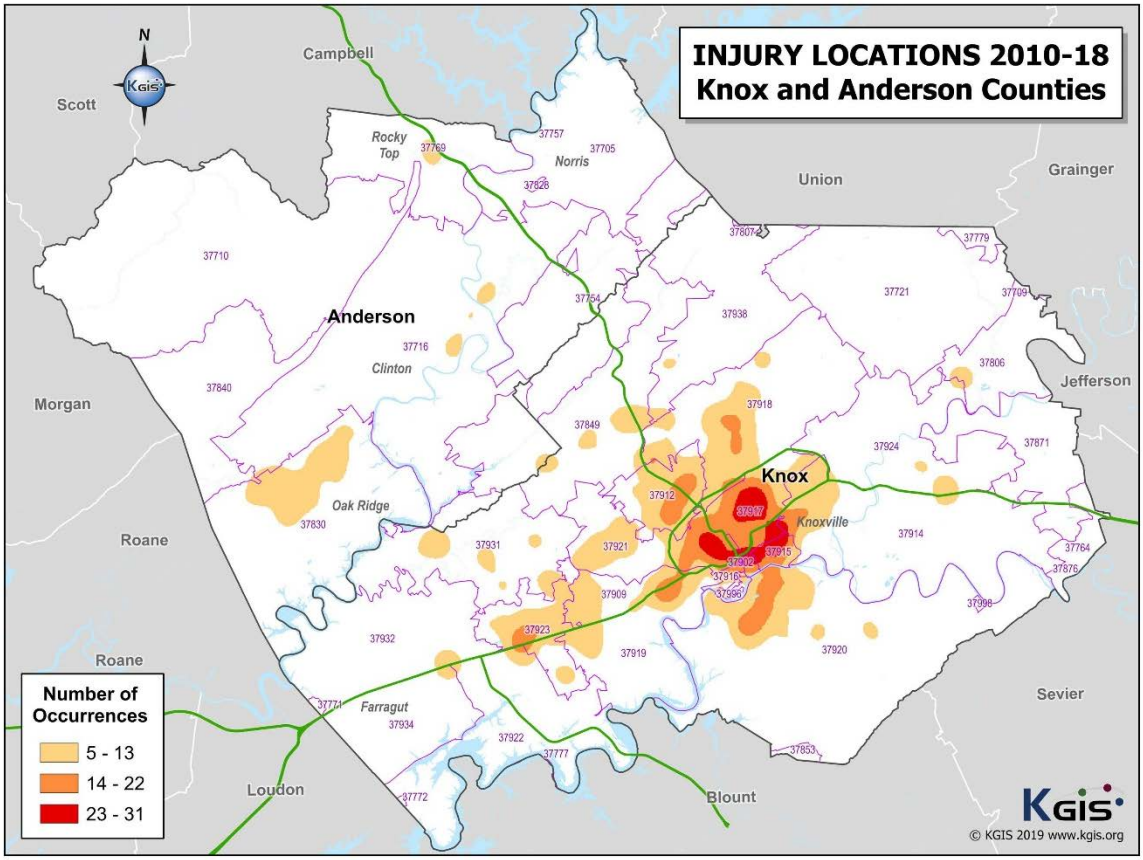
NOTES:

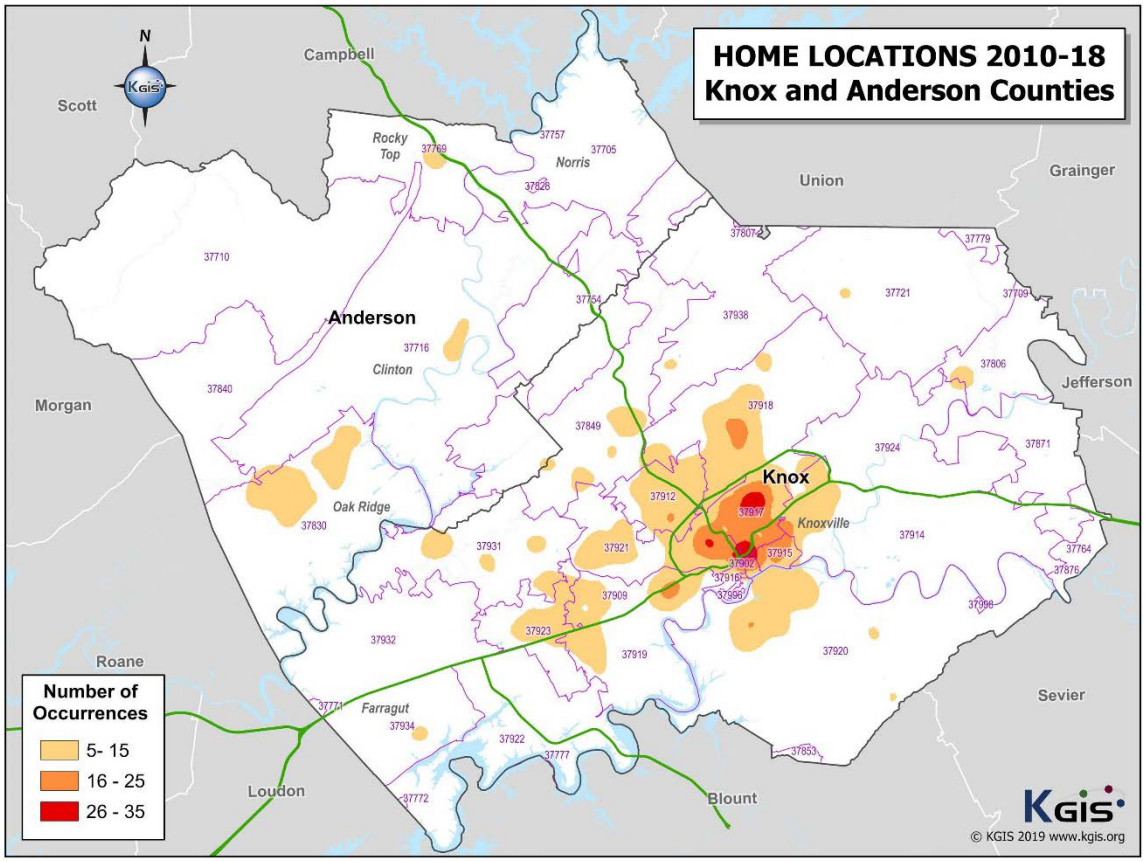
1. The Home Address Location maps represent where the people who died of a drug related death resided.
2. The Location of Injury Address maps represent where drug related injury occurred.
3. The Death Location maps represent where the people died from the drug related death. Hospital locations were added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



*Due to privacy guidelines, zip codes with less than 5 drug related deaths are not mapped.

2018 Drug Related Death Statistics





2018 Drug Related Death Statistics

TOP 10 DRUGS FOUND IN DRUG RELATED DEATHS BY YEAR FOR KNOX AND ANDERSON COUNTIES

	2010	2011	2012	2013	2014	2015	2016	2017	2018
#1	Oxycodone	Oxycodone	Oxycodone	Oxycodone	Oxycodone	Oxycodone	Fentanyl & Analogues	Fentanyl & Analogues	Fentanyl and Analogues *
#2	Alprazolam	Oxymorphone	Morphine	Morphine	Oxymorphone	Oxymorphone	Oxymorphone	Cocaine	Methamphetamine
#3	Morphine	Cocaine	Cocaine	Alprazolam	Alprazolam	Alprazolam	Oxycodone	Methamphetamine	Heroin
#4	Methadone	Alprazolam	Oxymorphone	Cocaine	Morphine	Cocaine	Alprazolam	Heroin	Cocaine
#5	Oxymorphone	Morphine	Alprazolam	Oxymorphone	Cocaine	Heroin	Methamphetamine	Oxymorphone	Alcohol/Ethanol
#6	Cocaine	Methadone	Methadone	Methadone	Methadone	Morphine	Cocaine	Alprazolam	Alprazolam
#7	Alcohol/Ethanol	Alcohol/Ethanol	Fentanyl	Hydrocodone	Fentanyl	Fentanyl	Hydrocodone	Oxycodone	Oxycodone
#8	Hydrocodone	Hydrocodone	Hydrocodone	Ethanol	Hydrocodone	Hydrocodone	Morphine	Alcohol/Ethanol	Oxymorphone
#9	Diazepam	Benzodiazepine (NOS)	Alcohol/Ethanol	Opiate (NOS)	Alcohol/ Ethanol	Alcohol/ Ethanol	Alcohol/Ethanol	Morphine	Morphine
#10	Carisoprodol	Diazepam	Diazepam	Methamphetamine	Diazepam	Methadone	Heroin	Hydrocodone	Methadone
#10			Amitriptyline		Buprenorphine				
#10			Methamphetamine						

*includes fentanyl, acetyl fentanyl, acryl fentanyl, butyrylfentanyl, carfentanil, cyclopropyl fentanyl, methoxyacetyl fentanyl, & valeryl fentanyl (red indicates new to area)

Data Source: Knox County RFC Medical Examiner Database, 2010 to 2016 and MDILog Database 2016 - 2018. Knoxville, TN.

Note:
1. Some drugs can be classified as Pharmaceutical and Non-Pharmaceutical which accounts for the difference in numbers between this graph and the "Drug List" graph count.
2. This report only notes the presence of the drug contributing to death but does not indicate the appropriate or legal use of a drug.
3. Drug poisoning deaths may involve more than one specific substance.
4. Some drugs are listed as Not Otherwise Specified (NOS) because information was obtained from sources that did not define drug type.

2018 Drug Related Death Statistics

Knox County Regional Forensic Center Frequency of Drugs Found in Drug Related Deaths in 2018			
	Total Cases (N=357)		
Drug	**Knox (N=325)**	**Anderson (N=32)**	**Total**
Fentanyl and Analogues	237	3	240
Fentanyl	175	2	177
Acetyl Fentanyl	46	1	47
Methoxyacetylfentanyl	8		8
Carfentanil	2		2
Butyrylfentanyl	2		2
Cyclopropylfentanyl	2		2
Valeryl Fentanyl	1		1
Acryl Fentanyl	1		1
Methamphetamine	115	13	128
Heroin	78	2	80
Cocaine	58	2	60
Alcohol/Ethanol	44	2	46
Oxycodone	36	6	42
Alprazolam	39	3	42
Oxymorphone	28	6	34
Methadone	17	2	19
Morphine	17	2	19
Buprenorphine	14	3	17
Hydrocodone	13	1	14
Diphenhydramine	13		13
Diazepam	8		8
U-47700	8		8
Gabapentine	4	3	7
Tramadol	4	1	5

Naloxone in Drug Related Deaths in 2018

2018 DRD Cases with Naloxone Use and Drug Type				
	Naloxone- Rx Drug Only	**Naloxone- Illicit Drug Only**	**Naloxone- Rx and Illicit Drug**	**Naloxone- Alcohol**
Knox	6	52	17	1
Anderson	1	3	1	0
	7	55	18	1

This report is also available online at
http://www.knoxcounty.org/rfc/reports.php.

*Acknowledgements to Will Fontanez @ KGIS, and Denise Edsell, RFC