



# 2018 Tennessee Drug Overdose Deaths

**Tennessee Department of Health  
Office of Informatics and Analytics**

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## Introduction and purpose

The purpose of this brief report is to describe drug overdose deaths in Tennessee in 2018, with an emphasis on providing useful data to stakeholders of Tennessee Department of Health (TDH) at the regional and county levels. Results presented here derive from vital statistics death certificate data as well as data from Tennessee's prescription drug monitoring program, the Controlled Substance Monitoring Database.

## Definitions

- Drug overdose (fatal and nonfatal)
  - A drug overdose is classified medically as a “drug poisoning.” An overdose may be fatal or nonfatal, and in Tennessee in 2017, approximately 13 nonfatal overdose discharges (both outpatient visits and inpatient stays combined) occurred for every identified fatal overdose.
- Underlying cause of death
  - To be classified as a fatal overdose, the underlying cause of death on a death certificate must be designated as a drug poisoning. Thus, while drugs play a part in causing some deaths, only those for which the drug poisoning is designated as the underlying cause of death are designated as overdoses by the Centers for Disease Control and Prevention (CDC). TDH provides death certificate data to CDC and they provide the final classifications and coding for the causes of death. For this reason, it is possible that local medical examiners may consider rates of overdose death to be different than the final, official statistical data. **Please see the next page for an important note regarding cause of death coding.**
- Contributing cause of death
  - In addition to the underlying cause of death, a death certificate may include multiple contributing causes of death. Once a death is designated as an overdose, the contributing causes provide data on the types of drugs that were present in the body of the decedent, as identified through toxicology report. Of note, contributing causes of death are coded using ICD10 codes, so drugs for which a code does not exist would not be identified in this way.
- Literal text on death certificates
  - In addition to the coded data available in the underlying and contributing causes of death columns of the data file, there are text fields available that may provide additional information. For example, no ICD10 code currently exists to specifically identify fentanyl; the analytic team uses a text search to identify cases involving fentanyl within the subset of individuals with an underlying cause of death of drug overdose.
- Controlled Substance Monitoring Database
  - The Controlled Substance Monitoring Database of Tennessee includes data on controlled substances that are *dispensed*. For our analyses, we include only those data on individuals who are residents of the state.

## Important Note for 2018 Overdose Deaths

The Tennessee Department of Health believes there may be a significant undercount of overdose deaths in 2018, primarily those occurring in Shelby county. A higher number of deaths of Shelby county residents were reported with unknown causes of death due to pending death investigations than in previous years.

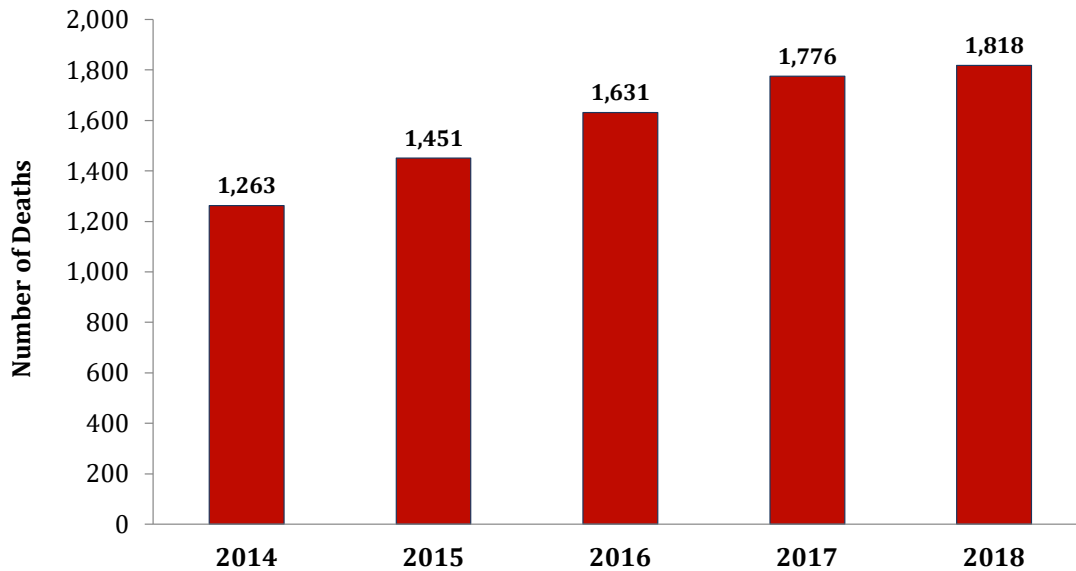
The process of submitting death certificate data from the previous calendar year to CDC closes in July of each year (e.g., 2018 deaths are finalized in July 2019). Deaths which do not have a cause of death listed at this time are given a code by CDC indicating that the cause was undetermined. Drug overdose deaths often take longer to determine than other causes because they require autopsy and toxicology reports to be completed and reviewed before a final cause is determined. Therefore, overdose deaths may be more likely to be coded as unknown causes by the CDC and not represented in the official counts provided by TDH.

In 2018, a large number of deaths that occurred in Shelby county did not have complete cause of death information at the time the CDC coding process was finalized. For example, approximately 1.9% of Shelby county deaths in 2018 (nearly 200) were still pending as of the final submission to CDC. While it's not likely that all of these deaths will be determined to be overdose-related, this represents a large increase from 2017 (0.6% pending in Shelby) and an even larger increase from 2016 (0.2% pending in Shelby).

**Therefore, we advise caution in interpreting the downward trend in overdose deaths across all categories of drugs among Shelby county residents for 2018.** As more information becomes available to TDH, revised estimates may be possible. We anticipate these revisions, if available, will reflect an increasing trend in overdose deaths in Shelby county that is in line with similar trends in the other large, urban counties in the rest of the state.

## State-level overview 2014 – 2018

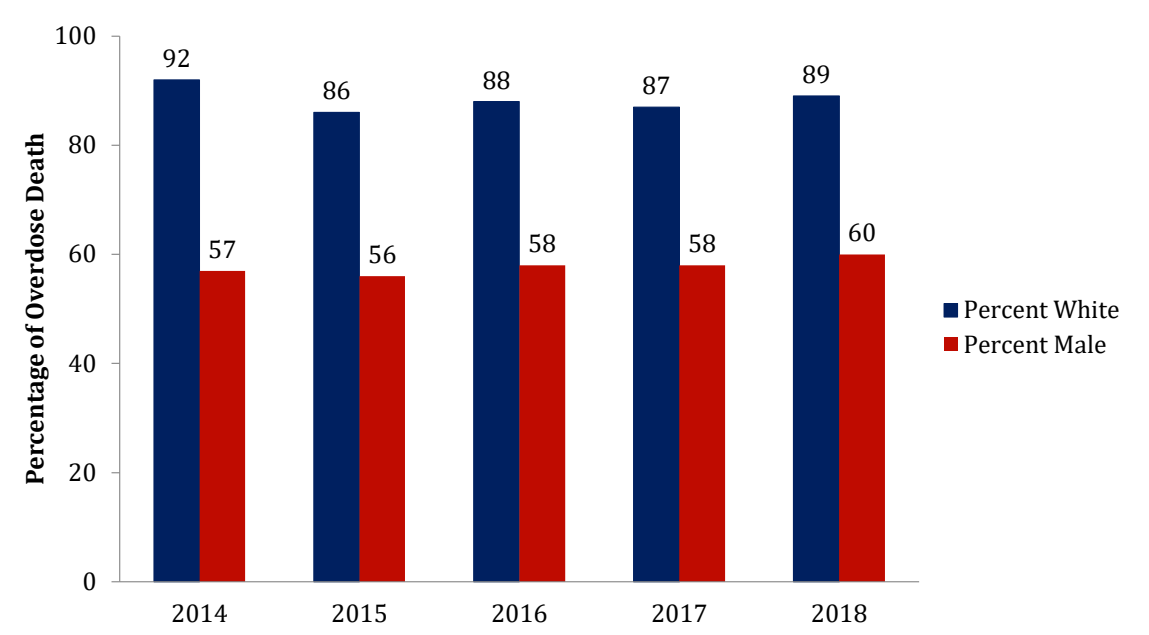
### Drug Overdose Deaths in Tennessee, 2014-2018




Source: Tennessee Department of Health, Office of Informatics and Analytics

Over the past five years, drug overdose deaths in Tennessee have consistently increased. In 2018, 1,818 Tennesseans died of a drug overdose.

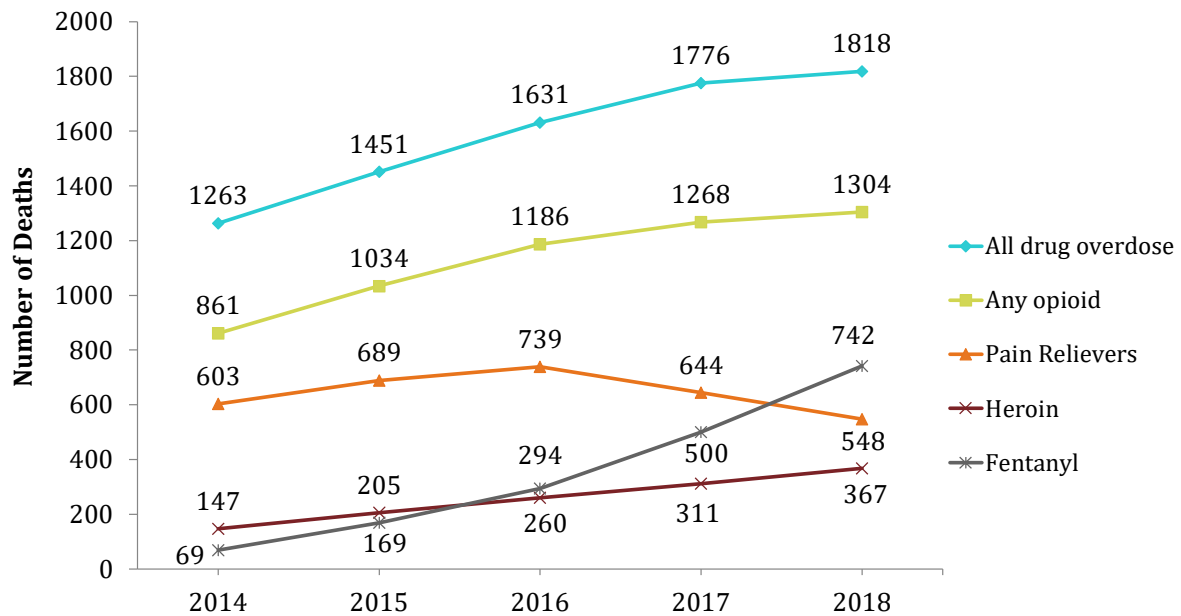
## All Drug Overdose Deaths by Race and Sex, 2014-2018



 Source: Tennessee Department of Health, Office of Informatics and Analytics

Tennesseans who died of a drug overdose were more likely to be white and to be male.

## Number of Overdose Deaths in Tennessee by Drug Type, 2014-2018

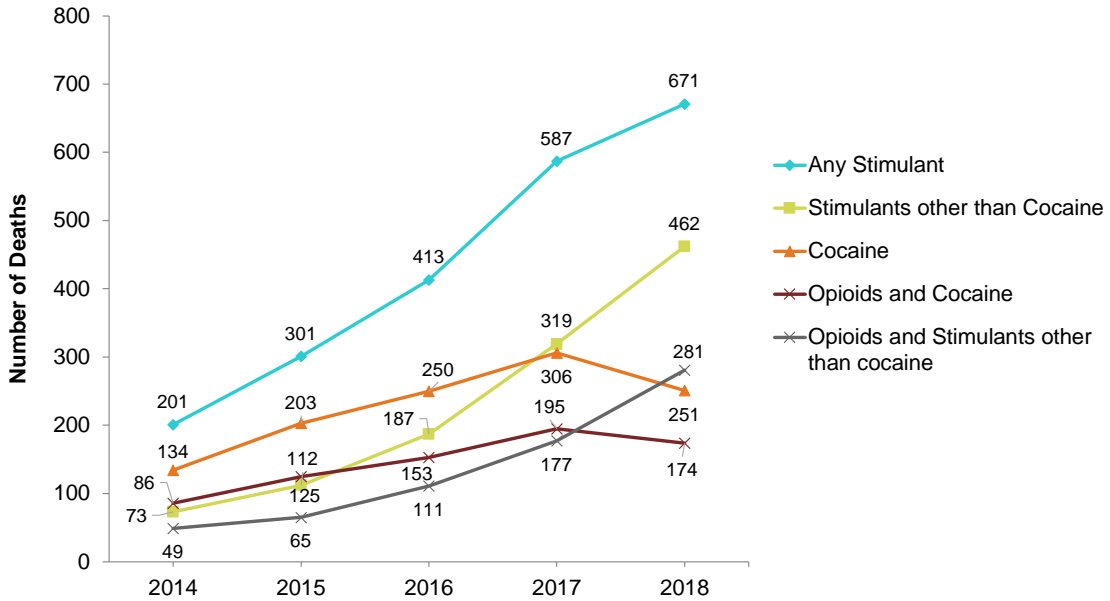


Source: Tennessee Department of Health, Office of Informatics and Analytics

Opioids have consistently been common contributing causes among drug overdose deaths in Tennessee. While deaths involving opioids identified as “pain relievers” (i.e., those typically obtained through a prescription) have decreased for the past two years, deaths involving any opioid have continued to increase. The increase in opioid overdose deaths appears to be primarily driven by deaths involving heroin and fentanyl. Heroin and fentanyl are two of the most common opioids that are obtained illicitly.

Of note, these are not mutually exclusive drug categories, and an overdose may have involved multiple types of opioids or non-opioid drugs.

## Number of Stimulant Overdose Deaths in Tennessee, 2014-2018



Source: Tennessee Department of Health, Office of Informatics and Analytics

Deaths involving stimulants other than cocaine, a category that includes primarily deaths due to methamphetamine, have also increased substantially over the past five years with a sharp rise in 2017. Deaths involving cocaine have also increased in recent years but declined in 2018.

## Number of people who died of a drug overdose in Tennessee by contributing substance, 2014-2018 (n= 7,939)

Overdose Death	2014	2015	2016	2017	2018
All Drug	1,263	1,451	1,631	1,776	1,818
Opioid	861	1,034	1,186	1,268	1,304
Pain Relievers (per CDC Definition, includes methadone)	603	689	739	644	548
Heroin	147	205	260	311	367
Fentanyl	69	169	294	500	742
Methadone	71	67	82	69	66
Benzodiazepine	388	492	573	504	409
Opioid and Benzodiazepine	352	447	522	447	354
Stimulants other than Cocaine	73	112	187	319	462
Cocaine	134	203	250	306	251
Opioids and Stimulants other than Cocaine	49	65	111	177	281



Source: Tennessee Department of Health, Office of Informatics and Analytics

Note that the pain reliever category includes natural and semi-synthetic opioids (such as morphine and oxycodone) as well as methadone. The pain reliever category does not include synthetic opioids such as fentanyl, nor does it include heroin. Benzodiazepines are a class of anti-anxiety drugs (such as Xanax) that can increase the likelihood of an overdose when combined with opioids. "Stimulants other than cocaine" include methamphetamine.



## Controlled Substance Monitoring Database Concordance

Percent who filled any prescription in the Tennessee CSMD within 365 days of death by type of overdose death among all individuals who died by year, 2014-2018 (n=7,939 total)<sup>a</sup>

Overdose Death	2014 (n=1,263)	2015 (n=1,451)	2016 (n=1,631)	2017 (n=1,776)	2018 (n=1,818)	Percent Difference <sup>b</sup>
All Drug	75	72	66	64	60	-15
Opioid	78	75	67	66	60	-18
Pain Relievers (per CDC Definition, includes methadone)	82	80	73	75	71	-11
Heroin	59	62	57	58	52	-7
Fentanyl	75	67	62	54	52	-23
Methadone	80	70	62	75	68	-12
Benzodiazepine	83	80	72	75	78	-5
Opioid and Benzodiazepine	85	81	72	75	76	-9

<sup>b</sup>Difference between 2018 and 2014



Source: Tennessee Department of Health, Office of Informatics and Analytics

The Controlled Substance Monitoring Database provides insight on the degree to which Tennesseans who die of drug overdoses have received prescriptions for controlled substances. For example, in 2018, 60% of individuals who died of an opioid overdose had filled any prescription noted in the CSMD in the past year, compared to 40% doing so in the past 60 days before death (see next page). *Categories of drug deaths are not mutually exclusive.*

**Percent who filled any prescription in the Tennessee CSMD within 60 days of death by type of overdose death among all individuals who died by year, 2014-2018 (n=7,939 total)<sup>a</sup>**

<b>Overdose Death</b>	<b>2014 (n=1,263)</b>	<b>2015 (n=1,451)</b>	<b>2016 (n=1,631)</b>	<b>2017 (n=1,776)</b>	<b>2018 (n=1,818)</b>	<b>Percent Difference<sup>b</sup></b>
<b>All Drug</b>	58	54	47	43	40	-18
<b>Opioid</b>	61	58	48	45	40	-21
<b>Pain Relievers (per CDC Definition, includes methadone)</b>	66	65	57	58	55	-11
<b>Heroin</b>	36	39	34	28	32	-4
<b>Fentanyl</b>	62	45	36	30	29	-33
<b>Methadone</b>	61	49	43	55	55	-6
<b>Benzodiazepine</b>	68	68	55	57	64	-4
<b>Opioid and Benzodiazepine</b>	70	70	56	56	62	-8

<sup>b</sup>Difference between 2018 and 2014



Source: Tennessee Department of Health, Office of Informatics and Analytics

Over the five year period from 2014-2018, we see a continual decrease in decedents who filled a prescription in the CSMD in the 60 days before death for most categories. Whereas in 2014, nearly 6 out of 10 overdose decedents had a filled prescription in the 60 days before death, by 2018 that number dropped to only 4 out of 10. These trends reflect the general shift away from prescription opioids and toward illicit opioids in driving the epidemic of overdose deaths.

**Percent who filled a prescription for an opioid or benzodiazepine in the Tennessee CSMD within 60 days of death by type of overdose death among all individuals who died by year, 2014-2018 (n=7,939 total)<sup>a</sup>**

Overdose Death	Opioid prescription filled						Benzodiazepine prescription filled					
	2014	2015	2016	2017	2018	Percent Difference <sup>b</sup>	2014	2015	2016	2017	2018	Percent Difference <sup>b</sup>
All Drug	48	45	37	34	27	-21	36	34	28	21	21	-15
Opioid	52	48	40	37	28	-24	38	36	28	21	21	-17
Pain Relievers	58	55	49	50	42	-16	43	43	36	30	30	-13
Heroin	28	27	26	22	22	-6	20	20	18	10	14	-6
Fentanyl	51	37	27	23	19	-32	38	24	17	11	12	-26
Methadone	49	30	32	46	30	-19	44	40	29	41	27	-17
Benzodiazepine	55	57	43	43	40	-15	52	53	39	38	49	-3
Opioid and Benzodiazepine	59	59	45	44	42	-17	52	54	40	37	47	-5

<sup>b</sup>Difference between 2014 and 2018



Source: Tennessee Department of Health, Office of Informatics and Analytics

The table above tells us what percent of individuals with each type of drug overdose had specifically obtained prescriptions for opioids and benzodiazepines in the past 60 days before death and the change in these prescriptions over time. For example, in 2018, 28% of individuals with an underlying cause of death of drug overdose and a contributing factor of an opioid had filled an opioid prescription in the 60 days before death.

## 2018 County Level Data

The following pages include county data on the number of overdose deaths in 2018 by a subset of drug types.

*Please note that the contributing drugs are not mutually exclusive and the counts of subcategories of overdose death will not necessarily sum to total overdose deaths.*

Categories of drug overdose are designated by the CDC for the Prevention for States program as follows:

	<u>Criteria</u>
Primary Inclusion/Exclusion Criteria:	Only Tennessee residents. Excludes voided death certificates.
All Drug Overdose Inclusion Criteria:	Deaths that have been coded with any of the following ICD-10 codes as the underlying cause of death: X40-X44: Accidental poisoning by drugs X60-X64: Intentional self-poisoning by drugs X85: Assault by drug poisoning Y10-Y14: Drug poisoning of undetermined intent
Drug Overdose Deaths Involving Opioids Inclusion Criteria:	Must meet criteria for All Drug Overdose deaths AND contain at least one of the following ICD-10 codes as a contributing cause of death: T40.0: Poisoning by opium T40.1: Poisoning by heroin T40.2: Poisoning by natural and semisynthetic opioids T40.3: Poisoning by methadone T40.4: Poisoning by synthetic opioids other than methadone T40.6: Poisoning by other and unspecified narcotics
Drug Overdose Deaths Involving Opioid Pain Relievers Inclusion Criteria:	Must meet criteria for All Drug Overdose deaths AND contain at least one of the following ICD-10 codes as a contributing cause of death: T40.2: Poisoning by natural and semisynthetic opioids T40.3: Poisoning by methadone
Drug Overdose Deaths Involving Heroin Inclusion Criteria:	Must meet criteria for All Drug Overdose deaths AND contain the following ICD-10 code as a contributing cause of death: T40.1: Poisoning by heroin
Drug Overdose Deaths Involving Fentanyl Inclusion Criteria:	Must meet criteria for All Drug Overdose deaths AND contain the following text in the contributing cause of death text fields: 'FENTAN'
Drug Overdose Deaths Involving Any Stimulant Inclusion Criteria:	Must meet criteria for All Drug Overdose deaths AND contain the following ICD-10 code as a contributing cause of death: T43.6: Poisoning by psychostimulants with abuse potential or T40.5: Poisoning by cocaine

### 2018 Overdose Death Counts by County

	All Drug Overdose Deaths	Drug Overdose Deaths Involving Opioids	Drug Overdose Deaths Involving Opioid Pain Relievers	Drug Overdose Deaths Involving Heroin	Drug Overdose Deaths Involving Fentanyl	Drug Overdose Deaths Involving Any Stimulant
Anderson	29	18	9	3	5	13
Bedford	11	7	1	4	6	7
Benton	4	1	1	0	0	1
Bledsoe	5	3	2	0	1	3
Blount	45	30	12	10	17	11
Bradley	29	17	9	3	7	9
Campbell	8	3	3	0	0	2
Cannon	4	3	1	1	1	2
Carroll	2	0	0	0	0	0
Carter	17	12	5	1	2	4
Cheatham	23	21	10	9	12	6
Chester	1	1	0	0	1	0
Claiborne	13	1	1	0	0	5
Clay	2	1	1	0	0	0
Cocke	10	6	4	2	4	6
Coffee	19	13	8	0	3	7
Crockett	2	2	0	1	1	0
Cumberland	10	7	5	0	2	4
Davidson	242	200	62	76	140	94
Decatur	3	2	1	0	1	3
DeKalb	7	4	2	0	1	1
Dickson	16	10	6	4	6	7
Dyer	3	0	0	0	0	0
Fayette	4	4	1	1	3	1
Fentress	2	1	0	0	1	1
Franklin	7	1	1	0	1	4
Gibson	10	6	1	2	4	3
Giles	7	4	4	1	1	4
Grainger	4	1	0	0	1	1
Greene	23	18	14	1	3	6
Grundy	4	2	2	0	0	2
Hamblen	10	7	4	1	2	0
Hamilton	66	41	17	10	17	25
Hancock	3	3	2	0	0	1
Hardeman	2	2	2	0	0	0
Hardin	8	5	3	0	0	3
Hawkins	13	11	9	1	3	1

### 2018 Overdose Death Counts by County

	All Drug Overdose Deaths	Drug Overdose Deaths Involving Opioids	Drug Overdose Deaths Involving Opioid Pain Relievers	Drug Overdose Deaths Involving Heroin	Drug Overdose Deaths Involving Fentanyl	Drug Overdose Deaths Involving Any Stimulant
Haywood	2	1	0	0	0	0
Henderson	8	6	6	1	1	3
Henry	10	7	6	0	0	2
Hickman	11	8	1	4	6	7
Houston	3	2	0	0	2	1
Humphreys	5	1	0	0	0	4
Jackson	3	2	1	0	1	1
Jefferson	15	5	1	3	3	5
Johnson	2	1	1	0	0	1
Knox	263	218	78	67	154	119
Lake	1	0	0	0	0	1
Lauderdale	3	2	1	0	1	0
Lawrence	11	7	5	0	1	2
Lewis	2	1	1	0	0	0
Lincoln	8	7	5	0	2	2
Loudon	14	7	1	3	6	4
McMinn	11	4	3	1	1	4
McNairy	2	0	0	0	0	0
Macon	3	2	1	1	0	1
Madison	9	5	4	1	1	2
Marion	3	1	1	0	0	0
Marshall	7	5	1	1	1	0
Maury	23	18	3	3	12	3
Meigs	0	0	0	0	0	0
Monroe	18	8	5	1	4	11
Montgomery	58	40	11	8	23	14
Moore	1	1	1	0	0	0
Morgan	5	3	0	0	1	2
Obion	5	3	1	0	3	2
Overton	6	5	5	1	2	1
Perry	0	0	0	0	0	0
Pickett	1	1	0	0	0	1
Polk	2	0	0	0	0	2
Putnam	20	8	4	4	4	10
Rhea	5	2	2	0	0	3
Roane	29	25	17	4	7	4
Robertson	14	10	6	4	8	5

### 2018 Overdose Death Counts by County

	All Drug Overdose Deaths	Drug Overdose Deaths Involving Opioids	Drug Overdose Deaths Involving Opioid Pain Relievers	Drug Overdose Deaths Involving Heroin	Drug Overdose Deaths Involving Fentanyl	Drug Overdose Deaths Involving Any Stimulant
Rutherford	89	68	23	26	44	24
Scott	3	1	1	0	0	2
Sequatchie	5	3	1	0	2	1
Sevier	46	38	12	12	25	23
Shelby	156	123	39	47	88	76
Smith	5	3	2	0	2	0
Stewart	7	6	2	1	6	2
Sullivan	58	43	30	7	18	14
Sumner	42	33	10	9	24	17
Tipton	15	12	8	3	8	6
Trousdale	9	7	3	0	2	5
Unicoi	7	5	4	0	0	0
Union	5	2	2	0	0	3
Van Buren	1	1	1	0	0	0
Warren	7	4	3	0	0	4
Washington	21	9	6	0	2	6
Wayne	6	4	3	1	1	2
Weakley	8	5	3	0	0	2
White	9	4	2	0	2	6
Williamson	39	30	12	15	15	13
Wilson	28	19	6	8	13	10
Unknown	1	0	0	0	0	1
<b>Tennessee</b>	<b>1,818</b>	<b>1,304</b>	<b>548</b>	<b>367</b>	<b>742</b>	<b>671</b>