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2019 Tennessee Drug Overdose Deaths

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

September 8, 2020

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Introduction and purpose

The purpose of this brief report is to describe drug overdose deaths in Tennessee in 2019, 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.

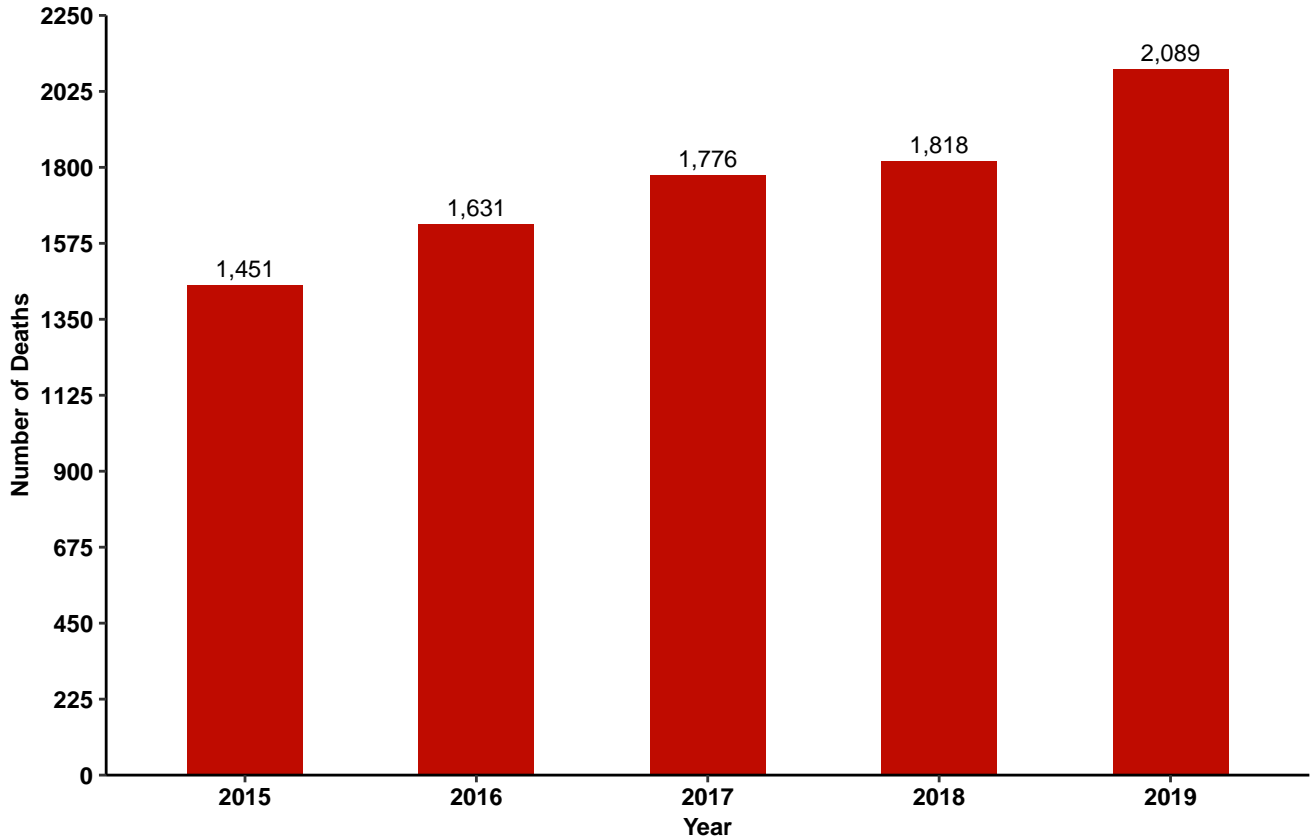
Definitions

- 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.¹
- 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 [page 18](#) 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.

¹[Tennessee's Annual Overdose Report, 2019](#)

State-level overview 2015 - 2019

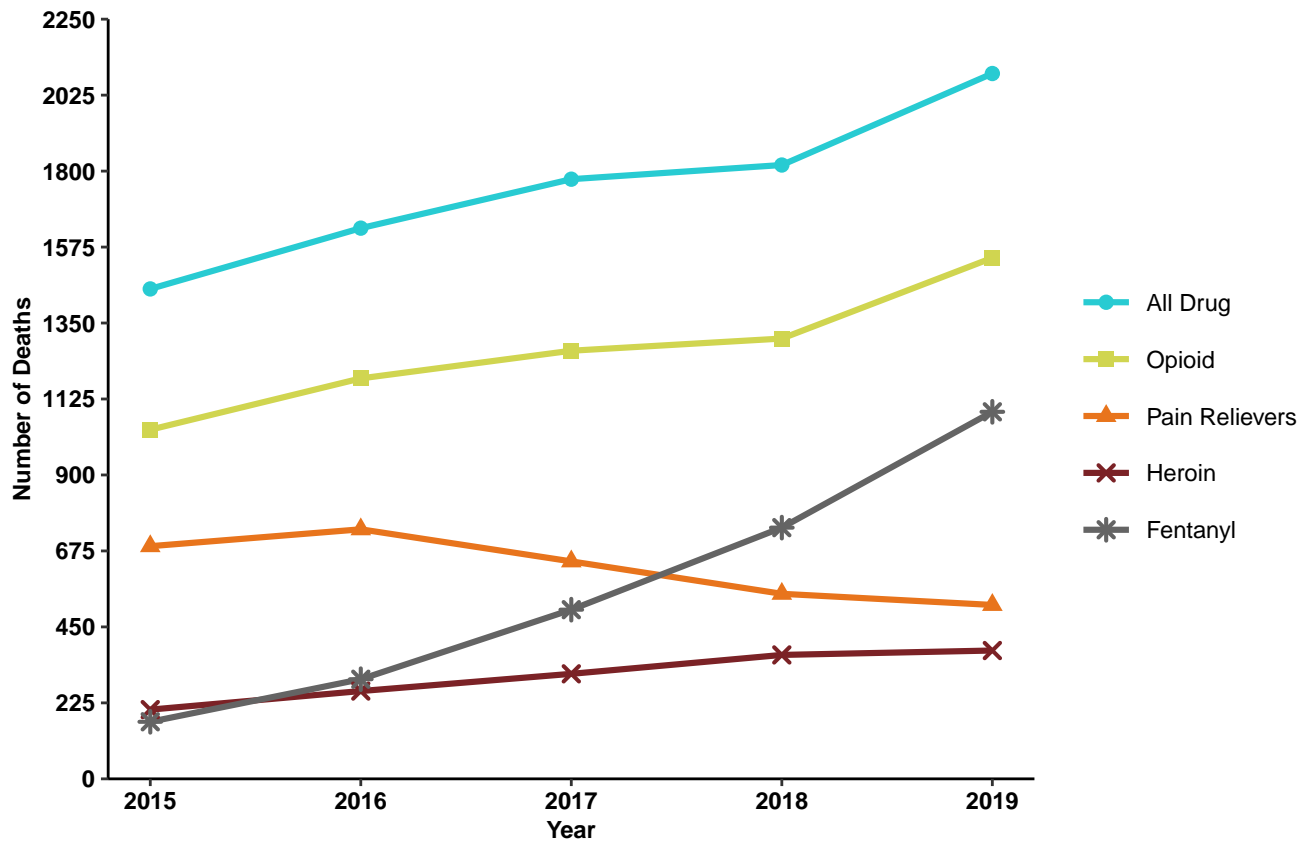
Drug Overdose Deaths in TN, 2015-2019



Analysis by the Office of Informatics and Analytics, TDH (last updated August 26, 2020). Limited to TN residents. Data Source: TN Death Statistical File.

Over the past five years, drug overdose deaths in Tennessee have consistently increased. In 2019, 2,089 Tennesseans died of a drug overdose. This represents a 15% increase in drug overdoses from 2018.

Number of Overdose Deaths by Drug Type in TN, 2015-2019



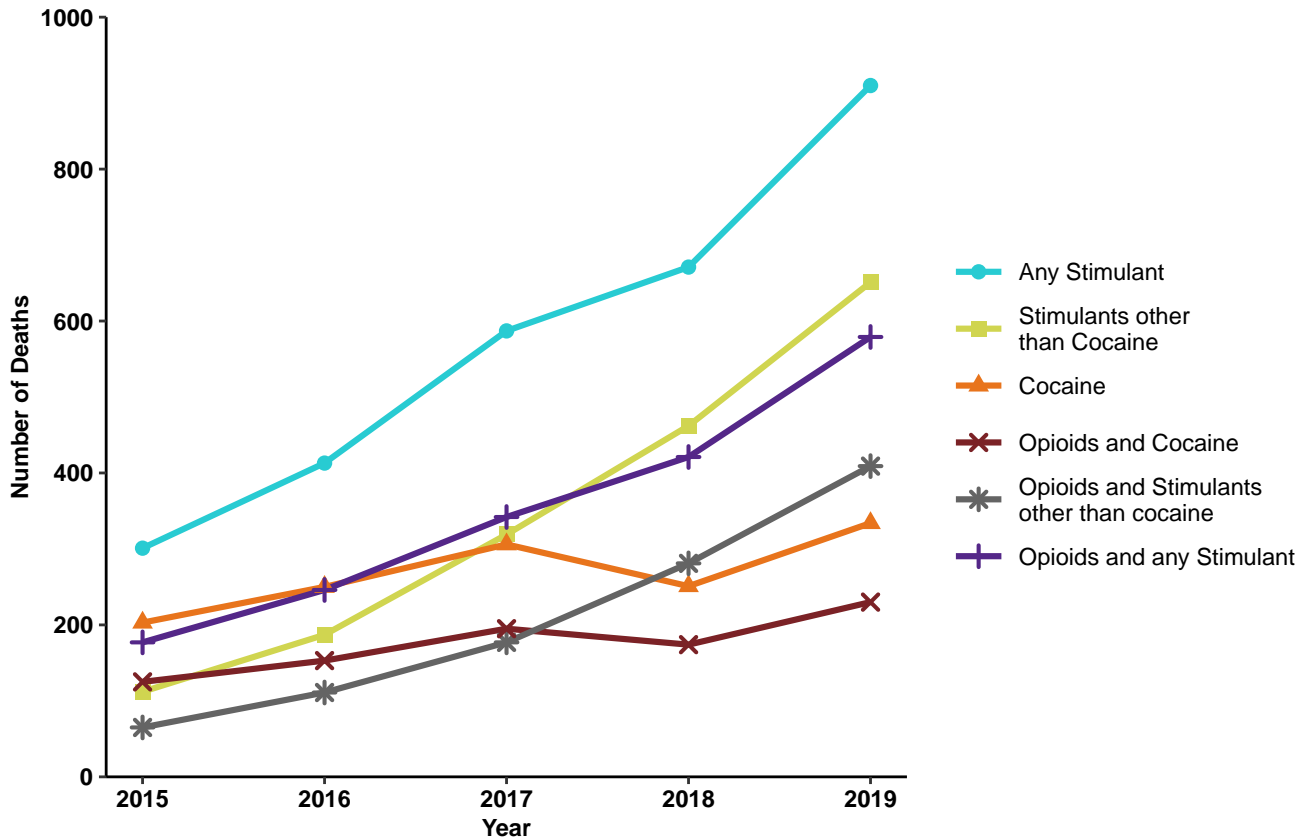
Analysis by the Office of Informatics and Analytics, TDH (last updated August 26, 2020). Limited to TN residents. Data Source: TN Death Statistical File.

Number of Overdose Deaths in TN by Drug Type					
Type	2015	2016	2017	2018	2019
All Drug	1,451	1,631	1,776	1,818	2,089
Opioid	1,034	1,186	1,268	1,304	1,543
Pain Relievers	689	739	644	548	515
Heroin	205	260	311	367	380
Fentanyl	169	295	501	744	1,087

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 three years, deaths involving any opioid have continued to increase. The increase in opioid overdose deaths appears to be primarily driven by deaths involving illicit fentanyl.

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 TN, 2015-2019

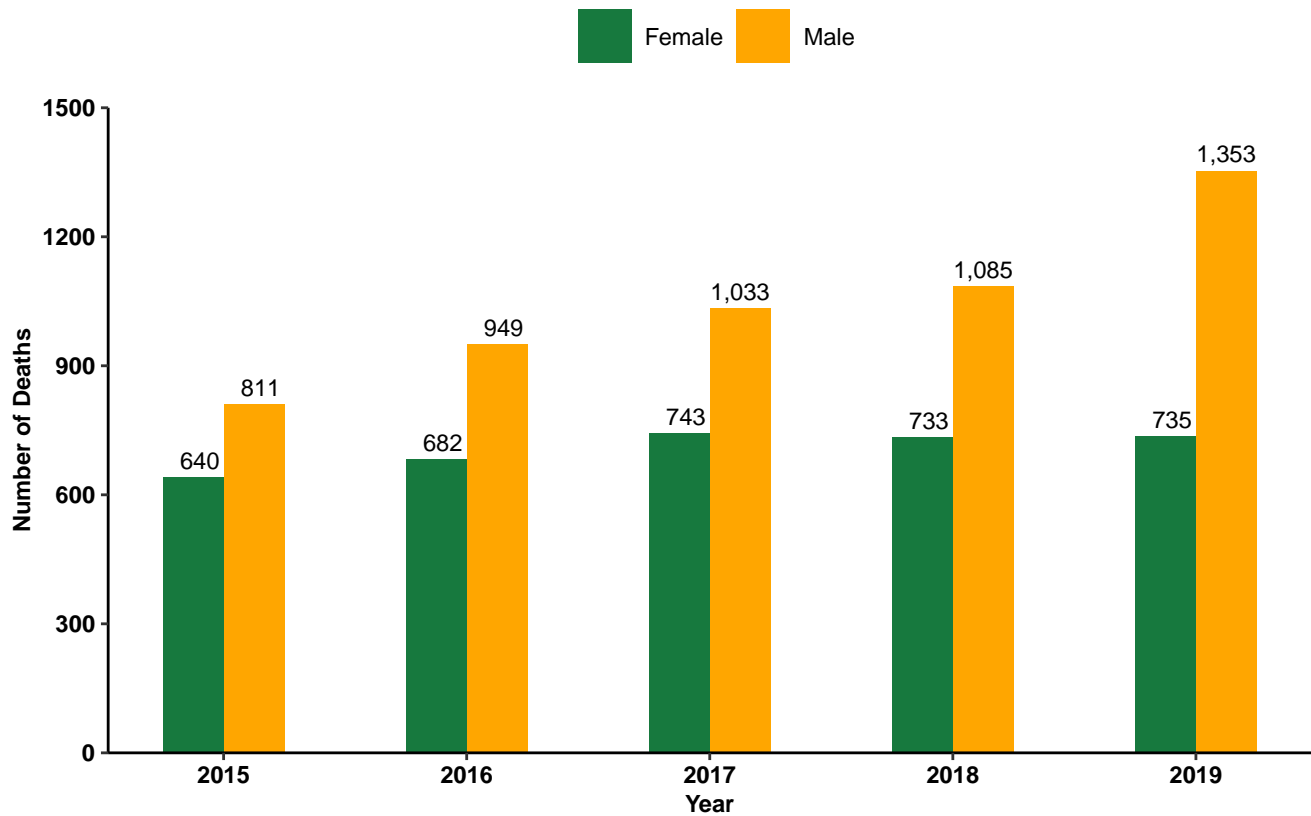


Analysis by the Office of Informatics and Analytics, TDH (last updated August 26, 2020). Limited to TN residents. Data Source: TN Death Statistical File.

Number of Stimulant Overdose Deaths in TN					
Type	2015	2016	2017	2018	2019
Any Stimulant	301	413	587	671	910
Stimulants other than Cocaine	112	187	319	462	651
Cocaine	203	250	306	251	334
Opioids and Cocaine	125	153	195	174	230
Opioids and Stimulants other than cocaine	65	111	177	281	409
Opioids and any Stimulant	177	246	342	421	579

Deaths involving stimulants other than cocaine, a category that includes primarily deaths involving methamphetamine, have also increased substantially over the past five years. Deaths involving both opioids and stimulants have also increased over the past five years.

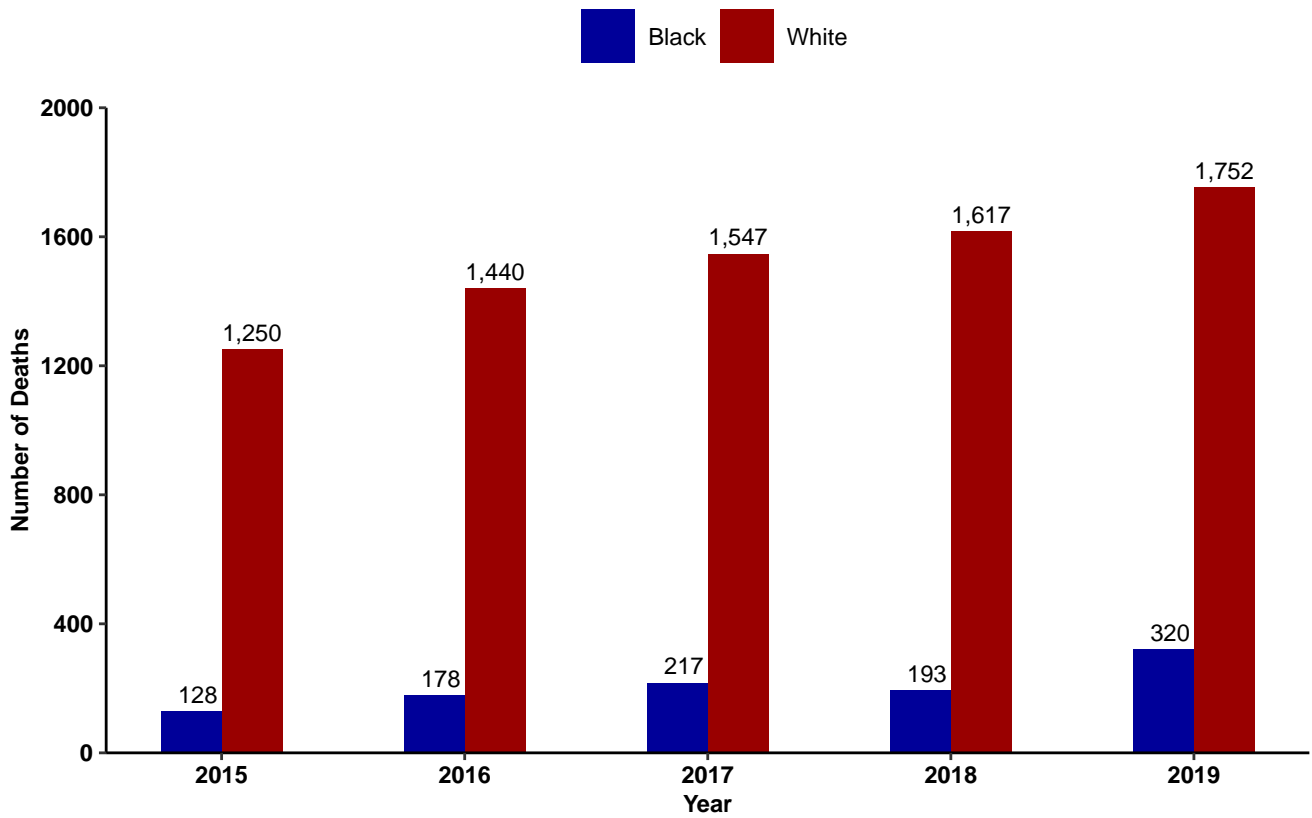
Number of All Drug Overdose Deaths by Sex in TN, 2015-2019



Analysis by the Office of Informatics and Analytics, TDH (last updated August 26, 2020). Limited to TN residents. Data Source: TN Death Statistical File.

Males have made up an increasing proportion of overdose deaths over the past five years. The number of females who died of a drug overdose has remained relatively stable for the past three years while the number of males who died of a drug overdose has increased every year. Nearly two times as many males died of a drug overdose in 2019 compared to females.

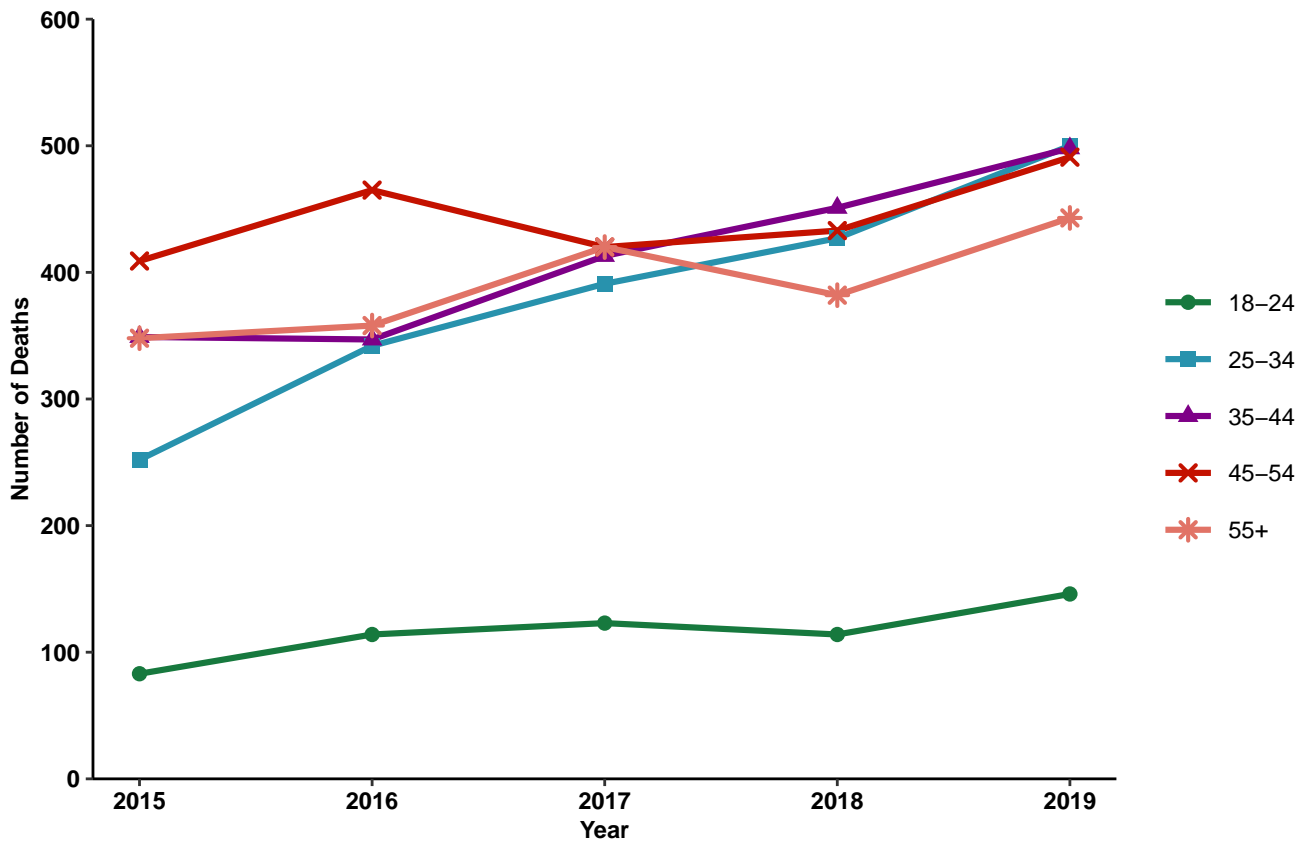
Number of All Drug Overdose Deaths by Race in TN, 2015-2019



Analysis by the Office of Informatics and Analytics, TDH (last updated August 26, 2020). Limited to TN residents. Data Source: TN Death Statistical File.

Tennesseans who died of a drug overdose were more likely to be White. Between 2018 and 2019, drug overdose deaths involving Black Tennesseans have increased 66%.

Number of All Drug Overdose Deaths by Age in TN, 2015-2019



Analysis by the Office of Informatics and Analytics, TDH (last updated August 26, 2020). Limited to TN residents. Data Source: TN Death Statistical File.

Number of All Drug Overdose Deaths in TN by Age					
AgeCategory	2015	2016	2017	2018	2019
18 - 24	83	114	123	114	146
25 - 34	252	342	391	427	500
35 - 44	349	347	413	451	498
45 - 54	409	465	420	433	491
55+	348	358	420	382	443

From 2018 to 2019, overdose deaths have increased among all age groups over 18. Between 2018 and 2019, persons aged 18-24 years had the highest percent increase (28%) of drug overdose deaths.

Prescription History in Overdose Deaths

Prescription History in the 365 Days Before Overdose Deaths in TN, 2015-2019

Percent who filled any prescription in the TN CSMD within 365 days of death by type of overdose death among all individuals who died, 2015-2019
(n_total=8,765, n_linked=7,646)

Overdose Death	2015	2016	2017	2018	2019	Percent Difference ^a
All Drug	75	69	66	60	55	-20
Opioid	77	70	68	61	56	-21
Pain Relievers	82	76	77	72	66	-16
Heroin	64	58	61	51	51	-13
Fentanyl	70	63	57	53	51	-19
Methadone	73	68	77	70	64	-9
Benzodiazepine	83	75	78	78	68	-15
Opioid and Benzodiazepine	84	75	77	76	68	-16

^a Difference between 2019 and 2015

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 2019, 56% of individuals who died of an opioid overdose had filled any prescription (reported to the CSMD) in the past year, compared to 36% doing so in the 60 days before death (see next page). *Categories of drug deaths are not mutually exclusive.*

Prescription History in the 60 Days Before Overdose Deaths in TN, 2015-2019

Percent who filled any prescription in the TN CSMD within 60 days of death by type of overdose death among all individuals who died, 2015-2019
(n_total=8,765, n_linked=7,646)

Overdose Death	2015	2016	2017	2018	2019	Percent Difference ^a
All Drug	57	50	45	41	36	-21
Opioid	61	51	47	41	36	-25
Pain Relievers	69	61	61	56	49	-20
Heroin	41	36	31	32	30	-11
Fentanyl	50	38	33	30	29	-21
Methadone	52	46	55	56	38	-14
Benzodiazepine	71	60	61	64	55	-16
Opioid and Benzodiazepine	72	60	59	62	55	-17

^a Difference between 2019 and 2015

Over the five year period from 2015-2019, there has been a continual decrease in decedents who filled a prescription in the CSMD in the 60 days before death for most categories. Whereas in 2015, nearly 6 out of 10 overdose decedents had a filled prescription in the 60 days before death, by 2019 that number dropped to less than 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.

Opioid and Benzodiazepine Prescription History in the 60 Days Before Overdose Deaths in TN, 2015-2019

Percent who filled a prescription for an opioid / benzodiazepine in the TN CSMD within 60 days of death by type of overdose death among all individuals who died, 2015-2019 (n_total=8,765, n_linked=7,646)												
Overdose Death	Opioid prescription filled					Percent Difference ^a	Benzodiazepine prescription filled					Percent Difference ^a
	2015	2016	2017	2018	2019		2015	2016	2017	2018	2019	
All Drug	47	40	35	28	22	-25	36	30	23	21	15	-21
Opioid	51	42	38	29	23	-28	38	31	23	21	16	-22
Pain Relievers	59	52	52	43	37	-22	46	39	32	30	24	-22
Heroin	29	27	23	23	18	-11	22	19	12	14	14	-8
Fentanyl	41	28	24	19	18	-23	26	18	12	12	12	-14
Methadone	31	35	46	30	15	-16	40	32	41	27	19	-21
Benzodiazepine	59	46	46	41	31	-28	55	44	41	50	39	-16
Opioid and Benzodiazepine	61	48	47	42	33	-28	56	44	40	48	39	-17

^a Difference between 2019 and 2015

The table above shows the percent of decedents 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 patterns over time. For example, in 2019, 23% of individuals had filled an opioid prescription in the 60 days before death, a 28% decrease from 2015.

2019 County Level Data

The following pages include county data on the number of overdose deaths in 2019 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.

2019 Overdose Death Counts by County

2019 Overdose Death Counts by County						
County	All Drug	Opioid	Pain Reliever	Heroin	Fentanyl	Stimulant
Anderson	32	24	14	5	11	11
Bedford	14	11	5	0	7	6
Benton	5	2	1	0	2	2
Bledsoe	3	1	1	0	0	0
Blount	49	34	15	10	21	12
Bradley	20	16	5	3	9	10
Campbell	11	5	3	0	1	6
Cannon	8	6	1	1	4	4
Carroll	2	0	0	0	0	1
Carter	14	8	7	0	3	5
Cheatham	27	23	8	7	16	7
Chester	2	1	0	1	0	1
Claiborne	7	3	2	0	1	4
Clay	2	1	0	0	1	1
Cocke	8	4	1	0	3	4
Coffee	14	11	4	1	6	6
Crockett	3	1	1	0	1	3
Cumberland	13	7	6	0	1	8
Davidson	329	279	78	80	216	129
Decatur	3	2	1	0	0	1
DeKalb	8	7	3	2	6	4
Dickson	27	24	9	6	20	12
Dyer	7	4	1	2	2	3
Fayette	6	5	2	2	1	1
Fentress	7	2	1	0	1	2
Franklin	10	9	1	3	6	1
Gibson	13	7	1	2	5	6
Giles	7	4	2	0	2	3
Grainger	8	3	2	0	0	5
Greene	18	9	5	1	2	8
Grundy	4	1	1	0	0	2
Hamblen	19	8	5	1	2	10
Hamilton	96	72	25	14	45	54
Hancock	0	0	0	0	0	0
Hardeman	4	4	2	1	4	3
Hardin	7	1	0	1	0	5
Hawkins	12	8	6	0	1	6
Haywood	1	0	0	0	0	1

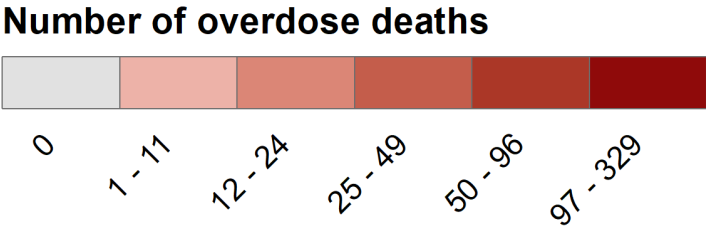
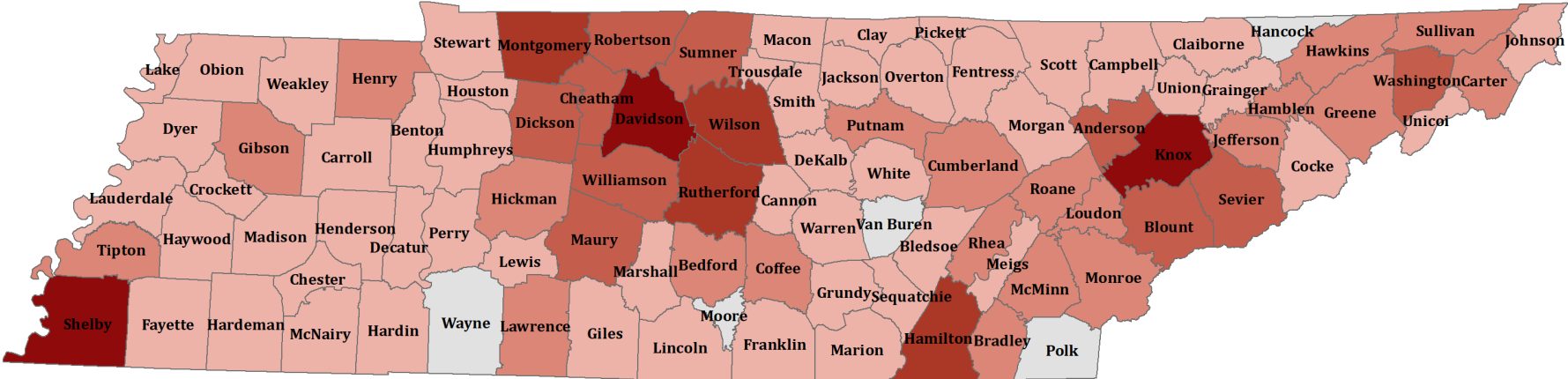
(continued)

2019 Overdose Death Counts by County						
County	All Drug	Opioid	Pain Reliever	Heroin	Fentanyl	Stimulant
Henderson	5	1	0	0	0	2
Henry	13	5	2	2	2	4
Hickman	12	7	3	2	4	4
Houston	2	1	0	0	1	1
Humphreys	6	3	0	1	3	3
Jackson	4	3	2	1	1	2
Jefferson	14	4	3	2	3	7
Johnson	5	1	1	0	0	4
Knox	222	186	58	45	143	100
Lake	2	1	0	0	1	1
Lauderdale	7	4	2	0	2	1
Lawrence	14	8	5	1	2	7
Lewis	2	2	1	0	1	0
Lincoln	6	4	2	1	3	4
Loudon	19	12	5	4	6	9
McMinn	12	7	4	0	4	6
McNairy	4	2	1	0	1	1
Macon	3	1	0	0	1	1
Madison	6	3	1	1	1	5
Marion	10	5	2	1	2	6
Marshall	10	7	3	3	2	6
Maury	28	24	7	8	17	12
Meigs	5	1	0	0	1	2
Monroe	16	10	4	2	4	9
Montgomery	73	62	15	7	49	23
Moore	0	0	0	0	0	0
Morgan	7	5	3	1	3	4
Obion	3	2	1	1	1	1
Overton	4	2	1	0	0	2
Perry	1	1	0	0	1	0
Pickett	1	0	0	0	0	0
Polk	0	0	0	0	0	0
Putnam	15	9	5	1	3	7
Rhea	14	6	4	1	2	8
Roane	13	8	5	1	3	8
Robertson	27	22	6	5	20	8
Rutherford	95	84	21	31	69	37
Scott	7	5	3	0	4	2
Sequatchie	6	4	2	1	1	3
Sevier	36	27	11	6	22	15
Shelby	268	204	50	54	171	139
Smith	7	3	1	1	2	3
Stewart	8	6	4	0	4	1
Sullivan	24	16	8	5	9	8
Sumner	47	38	9	11	29	15
Tipton	21	13	5	2	7	9
Trousdale	2	2	1	1	1	1
Unicoi	6	3	2	0	2	3

(continued)

2019 Overdose Death Counts by County						
County	All Drug	Opioid	Pain Reliever	Heroin	Fentanyl	Stimulant
Union	6	3	1	1	2	2
Van Buren	0	0	0	0	0	0
Warren	7	4	1	2	3	3
Washington	28	15	10	1	6	11
Wayne	0	0	0	0	0	0
Weakley	4	3	1	0	2	3
White	11	7	1	1	4	7
Williamson	36	31	3	13	27	16
Wilson	61	47	15	16	35	25
Unknown	4	2	1	0	0	2
Tennessee	2,089	1,543	515	380	1,087	910

Map: 2019 All Drug Overdose Deaths in TN Counties



Technical Notes: TN Drug Overdose Deaths Indicator

Categories of drug overdose are identified as follows:

Category	Criteria
Primary Criteria	Only Tennessee residents Excludes voided death certificates
All Drug Overdose	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	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	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	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	Must meet criteria for All Drug Overdose deaths AND contain the following text in the contributing cause of death text fields: 'FENTAN', 'FENTA', 'FANTAN'
Drug Overdose Deaths Involving Any Stimulant	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

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.